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# Geographies of Inequality in Latin America

Eds.: Verena Sandner Le Gall,  
Rainer Wehrhahn

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W. Hoppe, N. Oppelt, A. Vafeidis und R. Wehrhahn

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## **Geographies of Inequality in Latin America**

herausgegeben von  
**VERENA SANDNER LE GALL UND  
RAINER WEHRHAHN**

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The photo on the front cover shows inhabitants of a squatter settlement in Belém, Brazil.

Photo: Verena Sandner Le Gall

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## **Geographies of Inequality in Latin America – Introduction**

Verena Sandner Le Gall and Rainer Wehrhahn (Kiel)

Inequality remains a key issue in Latin America today. Despite economic growth and democratization processes, despite social movements and the creation of policies aimed at the reduction of inequalities and poverty, income distribution and general living conditions are still marked by extreme imbalances. While Latin America's economy, especially the export sector, has been subject to a general boom in the past few years, not all countries and regions are benefiting equally from economic growth, and growth is not necessarily resulting in the alleviation of poverty (SANGMEISTER 2012; RIMISP 2012). Although poverty rates have declined overall (CEPAL 2012), they remain high in some countries and the rates of the population affected by extreme poverty have risen. As the Gini coefficient of 0.51 shows, Latin America continues to be one of the regions with the highest levels of inequality in income distribution, and this despite some reductions in inequality levels between 2003 and 2010 (JIMÉNEZ and LÓPEZ AZCÚNAGA 2012). Considering human development as measured by the UN Human Development Index (HDI), some countries such as Honduras, Nicaragua and Bolivia also figure among countries with an unfavorable position.

Inequalities have been a constant in the history of Latin America. However, the polarization between those sectors of the population benefiting from economic growth and those who lose seems to have further increased in the wake of globalization processes, trade liberalization and the neo-liberal economic policies of the past decades. One of the central root causes for the unequal situation can still be seen in the colonial legacy of the concentration of land ownership, which is substantially higher than in other regions of the world (WEHR 2011). Furthermore, the predominant models of development have contributed to perpetuating historic socioeconomic divisions along the lines of social class, gender, race and ethnicity (CEPAL 2010), leading to multiple discriminations and marginalization. In consequence, the distribution of opportunities, assets, access to political, social and financial resources as well as to good quality education continues to be extremely unequal which in turn, in conjunction with the persistent power asymmetries, constrains the chances of the underprivileged sectors of Latin American societies to improve their livelihoods.

While the recent boom in resource extraction and the proliferation of the agroindustry may be interpreted in terms of overall positive economic effects, they also pose new challenges, not only regarding the potential danger of economic specialization and a return to

extractivist economies, but also with regard to the distribution of benefits, environmental costs and negative impacts arising from the growth of these sectors. In this context, but also as general issues of high relevance in Latin America, the displacement of rural populations, forms of land use and ownership, questions of governance of resource use as well as the current debates and concepts on the mitigation of global environmental change are important issues. At the same time, the livelihoods of rural populations relying on small-scale or traditional forms of land use and the development of isolated rural areas are also subject to impacts and influences by globalized forms of land and resource use.

In urban areas, processes of globalization and fragmentation play an important role and become manifest in space, not only through patterns of social exclusion, segregation and growing disjunctures between richer and poorer sectors of the urban social fabric, but also with respect to the transformation of public space which is subject to fencing and enclosure, as well as to reappropriation by urban inhabitants. While public spaces are increasingly subject to fencing and enclosure, also in the context of the growing importance of issues of security and securitization practices, processes of reappropriation by urban inhabitants can be observed as well. Urban planning and the construction of infrastructure remain important challenges which also have impacts on questions of social and spatial inequalities in Latin American urban centers.

The present volume on “Geographies of inequality” aims to discuss socio-economic, cultural, political and environmental dimensions of inequalities and their interrelatedness. We hope it will offer some fresh insights from current research projects carried out by geographers and scholars from neighboring disciplines who presented their work at the University of Kiel in April/May 2011 on the joint 5<sup>th</sup> Dutch-German symposium on Latin America and the 6<sup>th</sup> Workshop of the “Arbeitskreis Lateinamerika” (“Task Force on Latin America” in the German Society of Geography). While some of the contributions reflect insights from long-term scholarship and research experience in Latin America, others present the recent work of young PhD students. We believe the volume reflects a large variety of methodological and theoretical approaches to the study of a wide range of problems and research questions associated with inequalities in Latin America.

The contributions discuss core themes of geographic inquiry: the study of linkages between processes of local development in rural areas with processes of globalization, resource conflicts and governance, political ecology issues related to unequal access to resources and land as well as to power asymmetries and interests of different actor groups, the cultural and social embeddedness of structural inequalities and agency as well as the role of social constructions of otherness in the definition of identities and the spatial dimension of social exclusion, segregation and appropriations of space. Most of the presented papers include a political perspective on the studied issues and many deal with

interrelations of processes situated on different scales with some of the authors taking decidedly multi-scalar approaches. Many of the articles point to the observation that the studied issues of inequality are more often than not linked to power asymmetries and institutional weaknesses that account for a variety of problems, such as the perpetuation of inequality structures, the failure of well-intended measures or undesired side-effects of environmental policies, among others.

In the first contribution, **Paul van Lindert** and **Otto Verkoren** give a general overview of recent changes in paradigms, policies and practices with regard to governance, development planning and decentralization in Latin America. Many of the issues and concepts discussed here are taken up by the authors of the following contributions, which is why this first article may be read as being introductory to the whole volume. The authors begin by sketching important aspects of change the continent has undergone in past decades, namely cultural and social transformations, the shift towards market-oriented, liberalized economic systems, democratization processes transforming the political landscapes and finally the fading role of centrally driven, state-led regional planning approaches in favor of decentralized approaches with the rise of the municipality and a strengthened local level. After tracing the history of local economic development concepts and pointing to differences to the North American system, the authors then discuss some of the problems and contradictions in the implementation of the highly diverse decentralization and local development initiatives. Innovative approaches have been developed that foster local governance, aim at strengthening civic participation and move beyond mere economic development goals to include social and cultural aspects. However, the reality of planning is that there remain many barriers to the realization of a broader participation of all sectors of society and to the amelioration of living conditions.

The following first section of the book deals with human-environment relations regarding land and resource use practices as well as with questions of rural development, sustainability and vulnerability and the transformation of stigmatizing identity constructions of indigeneity into assets for the rural population. While some authors discuss inequalities in terms of uneven development and poverty linked to land use, others point to vulnerabilities in the context of access to water resources. Some of the contributions also open up issues of local ecological knowledge as well as the governability of resources in the context of global climate change and related discourses which will be further explored in the articles of the second section.

In the first section, **Richard Hastik**, **Clemens Geitner**, **Martina Neuburger** and **Claudia Stöcker** study the human impacts of land use practices on soils in pre-colonial times and their implications for current land use in the Llanos de Mojos in northern Bolivia. In an innovative multi-method approach combining methodological tools from physical

and human geography such as geodata, laboratory analysis of soil samples, qualitative interviewing and group discussions of soil samples, the authors trace the implications of pre-colonial practices for today's resource use. They come to the conclusion that soil fertility is elevated on ring ditches of pre-colonial origin, giving rise to the assumption that former inhabitants' land use practices substantially served to alter environmental properties. Furthermore, the assessments and practices of today's farmers who possess knowledge of these specific soils and use them as fertilizers were largely proven to be consistent with soil sample analyses, which provides one more example for the possible but often underestimated value of local ecological knowledge. The lack of recognition of ethno-pedology in local development concepts and the way in which the farmers' experience is devalued, even by the farmers themselves, underline the performative character of local ecological knowledge and also reflect current power asymmetries.

The dynamic development of the agricultural sector in many regions in Latin America could lead to the assumption that this would have a positive effect on livelihoods and poverty reduction of the local population. But in fact a mostly uneven development process is shown in the contribution by **Pablo Paolasso, Julieta Krapovickas and Fernando Longhi**, who prove the assumption of poverty reduction to be false in the case of the Gran Chaco in Argentina. In this region, which hosts the largest biomass reservoir in the extratropical southern hemisphere, deforestation advanced dramatically in the 1990s. Based on census data, the authors describe in detail how the massive shifts in the agricultural sector have led to general impoverishment in the region, despite some spatial differentiations. They show how the extension of the colonization frontier and the transformation of the traditional patterns of land use towards a predominance of soy bean and cattle production coincide spatially with the most elevated levels of poverty and have not overall led to improved living conditions.

Transformations in traditional use patterns of natural resources can also be studied from the angle of increased vulnerability affecting specific societal groups. This perspective is reflected in the paper by **Martina Neuburger, Georg Kaser, David Bregulla and Wolfgang Gurgiser** who present the preliminary results of a case study on the vulnerabilities of peasants in the Cordillera Blanca, Peru. The aim of the study is to understand interrelations between climate change, glacier runoff and water availability on one hand and water access, adaptation potential and the vulnerability of certain groups on the other hand. The governability of water generally is a highly relevant issue in the Andes and, in the case of the Cordillera Blanca, the authors show how global discourses on climate change have a direct impact on local patterns of water use and governance institutions. They study how household vulnerability is closely intertwined with these discourses as well as with community power relations, as these affect the households' participation in decision-making with respect to institutions of water management.

Uneven development, inequalities and poverty as ingredients of unsustainable development are often linked to emigration processes from rural communities towards large cities. Although the rural exodus from Andean communities is not a new phenomenon and has figured as one of the important factors in urbanization processes in Latin America, it is still a relevant process with new mobilities evolving under circumstances of uneven development. In their contribution, **Carla Marchant** and **Rafael Sánchez** trace the interrelations between poverty, inequalities and emigration, applying a notion of “unsustainable development” in a case study of the indigenous community of Lonquimay in the Araucanía region of Chile. The contrast between the lack of diversification as well as economic development in the isolated settlement and the dynamic economic growth and rise in prosperity the country has experienced in recent decades has led to new emigration dynamics from Lonquimay towards large cities.

A different perspective on rural, marginalized indigenous communities is taken by **Martina Park**, who stresses human agency in the study of identity construction among Saraguro, Shuar and *mestizo* groups in Southern Ecuador. After indigeneity in general being largely defined by non-Indigenous sectors of *mestizo* societies in terms of backwardness, rurality, subsistence agriculture and place-boundedness, the political mobilization of Indigenous people has increasingly enabled them to actively re- and self-define group identities. While Indigenousness constructed as stigma perpetuates marginalization, gaining definitory power over constructions of Indigenousness allows Indigenous people not only to defend themselves against discrimination, but also to strengthen their own assets, enhance access to resources and improve livelihoods.

The following **second section** takes up the issues of natural resource governance from the first section and includes the study of resource conflicts as well as policies and concepts for sustainable development including questions of environmental justice.

In the first contribution, **Udo Nehren** and colleagues discuss potentials and barriers to the implementation of concepts for the mitigation of climate change in an ecologically important region with Atlantic Rainforest near Rio de Janeiro, Brazil. Concepts such as REDD+ mechanism (Reducing Emissions from Deforestation and Forest Degradation), Payment for Ecosystem Services or Clean Development Mechanism (CDM), as debated in global arenas and defined within global agreements such as the Kyoto protocol, may serve to mobilize financial resources from developed countries for local sustainable development. This study explores the different concepts in detail and comes to the conclusion that some of these would certainly have positive environmental effects such as enhanced reforestation. However, the complexities of the interlinked issues of the socio-economic situation, the value of agricultural production on the respective lands, local participation, questions of land ownership and other aspects complicate the assessment and make some solutions

seem more feasible in the local context than others. The framework for analysis that the authors propose may serve as a valuable example for studying potentials for and barriers to the implementation of globally developed climate change mitigation measures on a local level.

The implementation of sustainable development concepts and programs may also lead to new inequalities, as some of the following papers discuss. **Alice García Santos** takes a political ecology and institutional analysis perspective for the study of negative impacts that environmental policies developed on a national level may have for local populations. Her case study in a village in the state of Ceará in northeastern Brazil is dedicated to revealing such impacts and conflicts in the context of the national wind energy policy and the growth of the wind industry. The results not only point to contradictions between the government discourse of the economically beneficial development of the wind energy branch and the actual situation in the community where no positive effects on the job market could be observed, but also lead to the conclusion that environmental injustice has increased and existing inequalities are intensified.

Conflicts in the context of resource use are also discussed by **Hanneke van der Heijden** in her contribution about decentralization reforms and the introduction of autonomous sub-national governance in Bolivia, paying specific attention to the natural gas sector. Departing from the broad theoretical notion of the “resource curse”, the author studies the linkages between resource abundance, government policies and the autonomy quest pursued by politically and economically powerful elite groups on the regional level in the eastern provinces of the Media Luna region. She dissects motivations, discourses and strategies used by these interest groups who link arguments about cultural and regional identity in regionalist demands to gain more political control over the gas sector. In contrast to much of the literature that stresses violent conflicts and secession in the context of the resource curse, the author shows that the recent decentralization reforms by the Bolivian government that give more autonomy to the regions have indeed resulted in decreasing social and political polarization and relieved socio-political tensions.

In the next chapter, **Michael Eichholz** continues with the study of the governance of resource use in Bolivia, however from a different perspective, stressing the social practice dimension in communitarian urban water supply systems of peri-urban quarters of La Paz. Against the backdrop of socio-economic inequalities manifest in urban fragmentation and segregation patterns, unequal, fragmented access to water resources is an important issue in many cities of Latin America. The author develops a conceptual framework for the analysis of water supply systems as socio-technological regimes and niche solutions based on Bourdieu’s theory of practice. The analysis of such systems as practices negotiated in social fields allows the social and political discourse, rationalities and the capital of different actor groups to be taken into account. As a result, it can be shown that

next to the central water supply system of La Paz that is dominated by one company, the alternative, self-organized forms of resource provision built on indigenous organizational principles are gaining importance and have been subject to a recent revalorization.

The following contribution is concerned with the study of water governance in the region on a different scale, analyzing the cross-border river basin management of the Acre River Basin in the Amazonic tri-partite region shared between Bolivia, Brazil and Peru (MAP). In her study, **Fernanda Mello Sant'Anna** takes a multi-scalar approach with the aim of understanding problems of transboundary water management in a region marked by economic and social exclusion and inequalities. From an institutional theory approach the author first detects classic problems of fit that arise due to the mismatch between ecological and institutional boundaries, before then analyzing problems on different scalar levels. The results show that water management in the region lacks coordination between the national and local scales, which is also discussed in the light of recent decentralization policies. However, it is the international scale that proves to be most fragile owing to a lack in harmonization and coordination and the prevalence of institutional weaknesses.

In the final chapter of the section, **Götz Kaufmann** offers insights into the application of a specific methodological approach for studying inequality patterns, local conflicts as well as the failure of environmental institutions and legislation from an environmental justice perspective. By using Q methodology, the author analyses discourses, perceptions and opinions about environmental and social problems among different social groups on an island in the Amazon in Brazil's state of Pará. These opinions about the relevance of current problems on the island differ substantially between employees of environmental protection agencies and the local population. While living conditions of the local, largely indigenous population have not improved during two decades of environmental legislation, environmental problems caused by tourism development and inadequate waste disposal systems also persist. Due to local power asymmetries, communication problems, institutional failures and also the lack of activity on the part of civil society, development is not moving towards a more sustainable path and the implementation of the legally defined protected area is largely unsuccessful.

The **last section** deals with spatial dimensions of inequalities in urban areas. In the context of the ongoing fragmentation of urban spaces, social inequalities and exclusion find their spatial expression in segregation patterns, but also in practices of securitization and in appropriations of public space in cities.

The contribution by **Katharina Schmidt** explores how the interaction between globalization processes and neoliberal urban development policies and security policy discussions on the regional and local level affect the appropriation of public space by different social groups. Starting from a critical urban studies perspective she asks how conflicts in and

about public space in Rio de Janeiro are negotiated, what the logics of action are and how power structures control the appropriation of public space. One central result of detailed case study analysis in two conflictive arenas in Rio is that uneven power relations lead to social inequalities which contribute to an unequal access to public spaces.

**Dominik Haubrich** presents first results of a current research project on security practices and their spatial manifestations in São Paulo. Taking middle-class everyday security-oriented practices in the district of Jabaquara as an example, he discusses changing practices in the context of the ‘security-certainty-safety’-concept of BAUMAN (1999). One of the results of his ongoing research is that all kinds of safety, certainty and security aspects can be classified as relevant for the change of all-day practices of the investigated population group. People avoid certain behaviors such as chatting with neighbors on the street or going out at night for dinner etc. The relationship between security and freedom has changed, implying severe consequences for the use and the appropriation of (public) space.

The article by **Marina Montelongo**, **Simone Sandholz** and **Johannes Hamhaber** explores the potential that collective housing in *vecindades*, a specific form of low-income housing in Mexico City, may have as a general example for achieving more sustainable forms of living. Drawing on multi-method empirical fieldwork in four *vecindades* and based on the concept of social capital, the authors come to the conclusion that the spatial layout of collective housing schemes with semi-public spaces plays a crucial role for interaction among residents and for the construction of social capital. *Vecindades* represent a self-organized way of countering the experienced exclusion, while offering more sustainable ways of life through social practices that result from poverty and necessity. They also have the side-effect of being environmentally more sustainable and could indeed therefore be used as models.

**Ximena Galleguillos** debates the role of territorial confinement for space related societal processes in the metropolitan region of Santiago de Chile. Spatial confinement is a consequence of the construction of more and more gated communities in Santiago. GALLEGUILLOS is currently investigating three gated settlements and presents first results from the case study of Peñalolén. She argues that the changing spatial segregation patterns finally lead to spatial confinement which may be interpreted as a product of geographical proximity. She associates these new processes with a communitarian sense of insecurity, representing constructions of class, gender and ethnicity.

The contribution by **Gonzalo Oroz** addresses the relationship between economic growth, the privatization of public infrastructure and processes of social segregation and polarization in Santiago de Chile. He focuses on the privatization of road infrastructures and housing construction in certain parts of Santiago. OROZ shows how the neoliberal para-

digm of urban development in the form of the private construction of new motorways in the Santiago region leads to a two class system of highways – one with poor conditions for less affluent people and a second one with high road prices for the upper class. Furthermore, the excessive privatization of infrastructures also promotes social segregation, a trend supported by the new private housing estates that are emerging in affluent regions of the metropolitan area.

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## **On Decentralisation, Local Governance and Local Development (Planning) in Latin America**

Paul van Lindert and Otto Verkoren (Utrecht)

### **Abstract**

Over the past few decades, the Latin American subcontinent has reinvented itself. For one, it has been a period which brought a substantial number of social and cultural changes. Next, globalization and liberalization hugely impacted on both the structure and development of Latin America's economies. As a consequence, import-substituting policies faded away, subsidies were cut, state-companies were trimmed or privatized, while the export-economy got (again) a more prominent place. Thirdly, the democratization process brought about important changes in Latin America's political landscapes and governance spaces. The demise of the (military-controlled) bureaucratic-authoritarian regimes went, eventually, hand in hand with the rise of popularly elected government and the rehabilitation of the representative democracy. In due course, Latin America's road to (the consolidation of) democracy was underpinned by the introduction of municipal elections, as well as a gradual transfer of political power to sub-national and municipal governments. Fourthly, as a consequence of the political changes in the era, the influence of state-controlled regional planning (and their manifold regional agencies) was drastically reduced. New planning approaches surfaced which were more flexible and less blue-print like, more of a bottom-up nature and less top-down, and more leaning towards local needs and resources instead of mainly inspired by national development goals.

It is tempting to connect the gradual withering away of state-controlled regional planning to the upsurge of local-level planning among many lower-tier government institutions (such as provinces or municipalities). After a cursory glance at the changing (institutional) stage, the paper addresses the Latin American perspective(s) on "local development", which basically is a multifaceted and highly differentiated topic. Although it is often perceived to have clear-cut development potentials, in the nitty-gritty planning practice huge stumbling blocks have to be overcome.

### **1 Introduction**

Roughly since the 1960s, the Latin American subcontinent appears to have reinvented itself. First and foremost, it was a period that brought quite some social and cultural changes, which greatly transformed the region. Thus, the process of urbanization turned the subcontinent from an essentially rural and fairly traditional society into a relatively modern,

urban and often highly metropolitanized one. The so-called demographic modernization process was another one, altering Latin America's populations by seemingly continuous decreases in natality and mortality rates and an unstoppable increase of life expectancy (see e.g. BLOUET and BLOUET 2006 or KENT 2006).

Next, globalization and liberalization hugely impacted both the structure and development of Latin America's economies. Indeed, most Latin American countries traded in their fairly protected and state-led systems for (more) liberalized and market-oriented ones, be it often hesitantly and under strong international (financial) pressures. As a consequence, import-substituting policies faded away, subsidies were cut, state-companies were trimmed or privatized, while the export-economy got (again) a more prominent place, this time also based on alternative agricultural or mineral exports as well as on assembly-based manufacturing types (see e.g. GWYNNE and KAY 2004; LARRAIN 2005; REYES and SAWYER 2011).

Thirdly, the democratization process would bring about important changes in Latin America's political landscapes and its systems of government. The demise of the (military-controlled) bureaucratic-authoritarian regimes went, eventually, hand in hand with the rise of popularly elected government, and hence the rehabilitation of the representative democracy (although it did not necessarily lead to the reduction of the ancient democratic deficits). In due course, Latin America's long and winding road to (the consolidation of) democracy, was on the one hand strongly underpinned by the introduction of municipal elections which would do away with the long-standing tradition of appointing mayors. A very important other element was the gradual transfer of (more) political power to sub-national and municipal governments. And the latter frequently also implied that the relationships between central, intermediate and local government were reformulated. By and large, these institutional changes increased the local political autonomy with respect to the central state (see e.g. LORA 2007; DAUGHTERS and HARPER 2007; GRUGEL and RIGGIROZZI 2009; SILVA and CLEUREN 2009; VAN LINDERT and VERKOREN 2010; DE LA CRUZ et al. 2011).

Fourthly, as a consequence of the political changes in the era, the influence of the state-controlled regional planning (and their manifold regional agencies) was drastically reduced, also as a result of massive expenditure cut-backs during the early phases of the neo-liberalization process. At first, there was little to replace the fading away of the centrally-led regional development planning processes (GILBERT 1997). Gradually though, new planning approaches surfaced that were more flexible and less blue-print like, more of a bottom-up nature and less top-down, leaning (somewhat more) to the local needs and resources. It was, by and large, the (politically more active) lower-tier governments that embraced these new approaches.

In practice, the implementation of local development planning by (or under the umbrella of) the local authorities, proved a long and winding process. Small wonder, when one realizes that the authorities had to meet with difficult and multi-faceted tasks, for which they had little experience, sparse trained personnel and totally inadequate financial resources. Still, in due course, it proved possible to gradually embed the essentials of local development thinking in local planning procedures and processes and to incorporate forms of civic participation. It happened also as a consequence of state institutionalist involvement in the process. This contribution overviews a few salient features of Latin America's recent local development planning experiences. After a quick glance at Latin America's national and regional planning policies, attention will be focused on the local development debate in Latin America (and its differences with North America). Next, the local development process is related to the national settlement hierarchy, to local decision making and the possibilities for participatory development.

## **2 Latin America: from regional to local development**

Regional (territorial) development planning has a long history in Latin America (see e.g. FRIEDMANN 1966; STÖHR 1975; STÖHR and TAYLOR 1981; ILLY and SCHMITZEK 1986; NUHN and OSSENBRÜGGE 1987; GARZA 1996; BOISIER 1997; 1998; 1999; 2000). Latin America's regional planning efforts indeed span many decades. ALMANDOZ 2010 advocates in this respect that Latin America's planning history even dips into the 1920s.

Although regional planning in Latin America has been a prominent political issue, there is little doubt that a fair part of Latin America's regional planning efforts eventually fell short of expectations. Admittedly, thanks to national planning and associated investments, Latin America's infrastructure is much better today than it was around the 1960s. Over the past decades, motorway networks have been impressively enlarged and improved and many rural and urban road-systems have been upgraded or newly created. Also, port and airport facilities were greatly improved, or built as a response to rising demands. In many regions, flood controls and irrigation networks were created or modernized, while local planning efforts did result in the branching out of electricity-, piped water- and sewage systems. Telecommunication improvements even went with seven-league strides, especially when the sector was by and large privatized. And finally, huge numbers of industrial estates, office parks, facilities for transportation and logistical needs have been constructed, as well as educational and health centres, bus stations, post offices etc. Thus, planning and planned investments were quite important indeed in creating the "hardware" to get the development process moving (be it not always sufficiently in the peripheral, rural regions).

The role of regional planning also clearly resounded in policies that aimed at the spatial decentralization of economic activities. In the 1960s and early 1970s, Latin America

was strongly characterized by huge regional imbalances in economic development that followed from the glaring contrast between the national core-areas and the impoverished peripheries. Thus, it was tried, to redirect the sheer unstoppable growth, densification and congestion of the core-region by spatial decentralization measures. In this respect, the curbing of the growth of the core-regions would, so it was expected, foster the growth of other large or medium-sized cities elsewhere (see e.g. NUHN and OSSENBRÜGGE 1987; AGUILAR et al. 1996; GARCIA ORTEGA 2004). Time and again it proved rather difficult to clearly show the very results of these programmes, also because the precise targets (and measures) were not always clear or undisputed. Nevertheless, in due course Latin America's urban systems did change, moving away from outspoken primacy and in the direction of the well-known "rank-size rule", especially because of the growth of the secondary and tertiary cities and the relative slowing down of the growth of the core-regions. And it has been observed that one might very well put these results in the perspective of the (decades of) spatial decentralization-oriented planning measures (see e.g. AGUILAR et al. 1996; VERKOREN 2002).

As to the realization of structural changes in the disadvantaged, isolated, rural regions Latin America's regional planning efforts were however less successful. Indeed, in this respect, the overall balance-sheet of Latin America's planning agencies is bleak, a phenomenon that is not new. GILBERT 1974 already showed that the regional planning agencies were only moderately successful and their results were often quite mixed, reaching some targets but missing out on others. More often than not, the agencies failed to arrive at relatively sustainable long-lasting structural changes in the disadvantaged regions over which they held sway (although the installed "hardware" certainly helped a bit). Small wonder that, when hard decisions had to be made as to the downsizing of the government apparatus, the national planning and the regional planning agencies were among the early victims of the national expenditure cuts.

It is tempting to connect the gradual withering away of state-controlled regional planning (agencies) to the upsurge of local-level planning, which took place among many lower-tier government institutions. Small wonder, since they were the ones that were confronted with new tasks and new fields of operation that were transferred to them under the new institutional regime. Many of Latin America's municipalities took up the gauntlet, starting to exploit the niches in the existing, national, political and economic structures (if the national regime allowed it). It was a complicated and often arduous job. Among the problems that had to be surmounted, one found the limited experiences in planning and development, a clear-cut lack of well-trained personnel, inadequate financial resources, or a political tradition which for a long time had been alien to good governance principles. The growing importance of local development planning efforts would, eventually, bring quite a few Latin American states back in the process, be it in a more supportive role, i.e. by issuing guidelines, manuals, advice etc. Thus, to support the process, the state issued

guidelines to specify the relationships between the local, provincial and national levels in the development process, while also denominating their respective responsibilities and roles. In addition, the lack of experience in the very planning process became state-supported, by the creation of (blue-print like) manuals to diagnose local opportunities and specify bottlenecks, to produce manuals for the full planning-cycle, to set budgeting and accounting measures, or to transfer knowledge about public participation and participatory planning procedures. Also, planning and development-oriented training programmes came into being, to upgrade the capacities of local government personnel. Hence, slowly but steadily, local development processes were embedded in nationally defined frameworks for spatial, economic and social development. However, the very implementation of the local development processes generally remained firmly in the hands of the lower-tier governments (ROSALES ORTEGA 2007; VAN LINDERT and VERKOREN 2010).

### **3 Latin America's local development thinking: a world apart**

By the beginning of the 1980s, a rapidly growing number of counties, cities and towns in the U.S.A. were embracing the principles of Local Economic Development (LED), as a tool to stimulate local commercial activity and to create (or maintain) local jobs. To that end, different approaches had come into being, which addressed the opportunities for local development. As GUIMARAES 1997 observed, local development approaches originally strongly radiated 'practitioners-knowledge', without paying much attention to theoretical reflections. As insight in local and regional (economic) development processes was gradually enlarged, LED-approaches were adjusted. Thus, over time relevant economic (development) theory was brought in, also by making way for concepts such as competitive advantage, social capital, business expansion and retention, or learning regions. Next, the process of local development perspectives was linked to higher spatial scales (more especially to the global-local nexus). Furthermore, local development thinking began to make room for proper institutionalist foci. And eventually LED-analyses also began (if only hesitantly) to reflect the role of governance. Indeed, in comparison with the early 1980s, U.S. local development thinking and related approaches have clearly matured, as comes to the fore in the major LED-oriented textbooks (see e.g. BENDAVID-VAL 1991; BINGHAM and MIER 1993; HUSTEDDE et al. 1993; SHAFFER et al. 2004; KEMP 2007; BAIR and CARROLL 2008; BLAKELY and GREEN LEIGH 2009; or ROWE 2009)<sup>1</sup>.

By the beginning of the 1990s, the local development debate was also surfacing in the Global South. Step by step, local development-related ideas were discussed by scholars, practitioners and gradually accepted by law- and policy-makers. Spearheaded by scholars

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<sup>1</sup> By and large, the Latin American debate on local development stands on its own and it does not seem to be closely linked with its "North American corollary". References to or quotations from the North American sources are not often made, arguments are only scantily borrowed, and even proven methodologies are hardly incorporated. Indeed, both sets of literature seem to deal with another world, with other ideas and approaches, having not too much in common.

Table 1: Schematizing some differences in local (economic) development approaches in North- and Latin America.

<b>Topic</b>	<b>North America</b>	<b>Latin America</b>
<b>Politics</b>	Based on national/regional development strategies that had come into being over time, with their legal, institutional and financial frameworks.	More broadly formulated policy goals that also pay attention to e.g. the participation of local civic society in decision making, poverty alleviation, gender equality/equity, sustainable development and (environmental) governance.
<b>Finance</b>	Apart from tax raising possibilities of local governments, local development efforts are also using existing, national financial support-systems for local development, as to e.g. small or medium enterprises, minority- and gender-based groups, empowerment zones (etc).	Financial systems which specifically support local development are generally lacking, while local authorities have only little possibilities to raise local taxes. Financial support for lower level administrative bodies is generally made available through transfers from central government.
<b>Territorial orientation</b>	Strongly oriented on urban areas ("cities") with little attention for the rural or peripheral areas.	Aimed at both urban and rural development (as a logical consequence of the spatial structure of the municipalities).
<b>Thematic orientation</b>	Strongly oriented on economic and entrepreneurial development.	The economic and entrepreneurial are often getting less emphasis, while social development (as embodied by e.g. public service delivery, poverty abatement, sustainability etc.) are often clearly visible. Moreover, popular participation is often an important element of the local development framework.
<b>Implementing organizations/institutions</b>	Public-private partnerships (like Chambers of Commerce, Local Development Corporations) are generally in the driver's seat of the process.	In principle in the hands of local government, sometimes in combination with a supra-local organization (such as a <i>mancomunidad</i> ).

Source: Own compilation

like DE MATTOS 1989; AROCENA 1995; ALBUQUERQUE 1999; BOISIER 1997; 1999; or CORRAGIO 1998, the local development debate in Latin America soon took a different turn. Table 1, which juxtaposes the major differences between the two debates, clearly underlines this.

In North America (and Western Europe), the LED-approaches were soon supported by nationally defined regulation, and backed by appropriate financial stimuli for local economic development. In Latin America, the local development practice was by and large coming about before appropriate law-making had come into being, and generally it is still operating without specific financial support for local development approaches.

Next, the North-American LED-debate had a clear-cut sectoral nature, while the Latin American debate became evermore territorial. Instead of a strong focus on “the economics of local development”, it gradually absorbed social and even cultural orientations, while diminishing the role of “economics” as the prime driver of the process. Although LED in “The North” kept a strong orientation on local production, employment and entrepreneurship, the Latin American variant was widening its approach, embracing (apart from “the economic”) e.g. the provision of (public) services, pro-poor policies, minority- or gender-oriented development initiatives, sustainable development foci. Small wonder that the word “economic” eventually began to fade away in the Latin American debate and associated strategies. Indeed, for more and more Latin American scholars, the attainment of socio-political change at the local level even became a more important objective than “mere local economic development”. As GALLICHIO (2006, pp. 63) put it: “El desarrollo local no es una tecnología a aplicar en cualquier circunstancia. Es ante todo, una estrategia socio-política de cambio”.

The original (North American) LED-policies had a clear-cut urban orientation, a phenomenon that was of course closely linked to the fact that US-urban places were generally considered as separate, independent entities within the so-called county-structure. However, in Latin America local development is delegated to the municipalities, which reign over large tracts of land with highly different urban and rural spaces. Sometimes, these municipalities belong (or are very close) to the metropolitan areas or large cities, where the development perspectives maybe fairly promising. However, the planning for local development in Latin America also meets with the limitations and constraints of the more rural municipalities, much further from the national core areas, where opportunities and alternatives for local development are often very thin. Implicitly or explicitly, the huge (spatial) differentiation between (and even within) Latin America’s municipalities plays an important role in the local development debate.

The local development process in North America is, to a very large extent, implemented by professionally run Local Development Corporations (often public-private partnerships), that operate under the umbrella of, or act in close cooperation with, the local Chamber(s) of Commerce. In their work, these organizations can tap in institutionalized local development-opportunities, e.g. to help medium- and small scale enterprises with business loans, to create enterprise- or empowerment zones (etc.). In the process, local government often plays a minor role, generally in the backseat. In Latin America’s local

development practice however, local government is generally the prime mover and shaker for local development, often as an immediate consequence of political restructuring and administrative decentralization. To comply with the new tasks, the originally fairly top-down decision-making structures have changed (somewhat), also to incorporate (some principles of) local governance and to come up with (elements of) participatory decision-making.

In our view, Latin America's *desarrollo local* has over time moved away from the original, "North American" LED-based approaches and strategies. At the same time however, it appears that it has become a container-notion, which covers highly different goals and strategies. Thus, to some, local development still is a fairly narrow concept, that resounds "economic development" (see e.g. AROCENA 1995; Asociación Chilena de Municipalidades 1996; ALBUQUERQUE 1999). Others (like LEA PLAZA and SÁNCHEZ 1999) perceive local development as community-based phenomenon, which stresses the role of livelihoods and other non-economic factors. And again others (such as BUSTAMANTE 2004; ALTSCHULER 2006) link the notion to a clear-cut locality-based orientation that aims to improve local life by strengthening the local economic, social, political situation. Indeed, "local development" in Latin America has many different faces, which definitely is a complicating factor in the debate.

#### **4 Local development and the settlement hierarchy**

As we have seen above already, in North America local economic development was (and still is) strongly oriented to the urban areas. Latin American municipalities are only seldomly solely urban. On the contrary, the municipal governments may – while ruling from the so-called *cabecera* (i.e. the administrative seat, which frequently coincide with the largest town) – well be responsible for very extensive areas, which easily embrace various urban settlements and a range of rural areas, with villages, hamlets and dispersed populations. Next, as a consequence of the (ongoing) political reforms, today's Latin American municipalities cannot simply brush aside the needs and wishes of their rural (dispersed) populations, as was often the case in the past. Thanks to political reform process, the ruralites not only were granted a voice in the development of their own habitat, but frequently also (some) influence over "their share of locally available means" (VERKOREN 2002). In this respect, the political reforms are, if only step by step, diminishing the dominance of the local urban elites and their long-standing economic neglect of the countryside.

Once the principles of local development are accepted, they are in principle applicable to all municipalities of the nation, large or small, rich or poor, located in core-regions or in far away peripheries. Of course these municipalities show huge differences, and – as ARROYO (2001) already pointed out – this is not merely a matter of population figures.

On the contrary, the varieties between municipalities also come to the fore in highly differentiated civil societies, development potentials, poverty levels, technical capacities of local governments (etc.).

Such differences are immediately influencing local development planning. For one, it is almost commonly accepted that larger urban municipalities, thanks to their diversified production structures, are more suited for actions which aim to reinforce (self-sustained) economic growth (see e.g. VAN LINDERT and VERKOREN 1997; TITUS and HINDERINK 1998; TACOLI 1998; or SATTERTHWAITHE and TACOLI 2003). However, down the settlement hierarchy, one encounters many smaller municipalities, without the potential to easily attract modern enterprises, but with development opportunities for relatively “traditional” production activities, e.g. based on their market functions for a large hinterland. Hence, as to this category, suitable local development options are likely to start with the strengthening of (collective and commercial) service-functions, to improve the (socio-economic) conditions of populations in the municipality and the hinterland. At the bottom of the settlement-hierarchy, more especially in the isolated, deep rural spaces, the opportunities for local development will generally be quite thin. Of course this does not mean that the lowest levels of the settlement hierarchy are unfit for local development. Here, local community-based activities may well be a good starting point, especially when tied to the principles of *autogestión* or specific demands of the local community. Moreover, it is possible to tie local development approaches to existing livelihood frameworks in the communities (which even offers opportunities to relate local development to wider value-chain approaches). There is, indeed, quite an array of fruitful approaches which improve local welfare and local livability conditions, even at the bottom of the settlement-pyramid (see e.g. PADER/COSUDE 1998; ARROYO 2001; CARPIO BENALCÁZAR 2006; ARZALUZ et al. 2008).

It follows that the main thrust of “local development policies” may well be changing when descending the national settlement-hierarchy; or when developing suitable local development options for the individual settlements *within* a municipality. Thus, the municipalities in the upper echelon (i.e. municipalities which contain the largest, strongly urban municipalities) are generally the most suitable environments for *exogenous growth-generating policies*, more especially in the main urban areas and the immediate hinterlands. As to the municipalities in the “middle segment”, the possibilities for exogenous growth policies will be more limited. Here, a policy of *endogenous growth* will be more pertinent, e.g. based on the presence of local economic activities which successfully operate in the (inter)national mining- or manufacturing markets. Such a policy-approach may be successfully combined with the strengthening of collective service-levels and the expansion of commercial service-functions, in order to improve market-functions for the surrounding countryside. As to the smallest – and frequently deeply rural – municipalities at the bottom of the hierarchy, the most suitable and attainable local development options

are generally related to *community-oriented approaches*. Instead of presenting these three different approaches as outright alternatives, it is much more fruitful to perceive them as different elements of a local development framework which recognizes the spatial and socio-economic differentiation within the national settlement hierarchy, while accepting the logic of different approaches for different situations. The presented “variants” are above all complementary, not mutually exclusive. In fact, many local development programmes may well consist of multidimensional policy-packages that contain various *ejes estratégicos* which aim to combat different goals and to support different social groups.

## 5 Local development and local (financial) decision-making

Under the newly gained mandates of the decentralization policies, the fostering of local development – in order to achieve poverty reduction – has become an important task of local governments across the Latin American region. Unfortunately, administrative decentralization has not been matched with fiscal decentralization. Consequently, local governments in Latin America are confronting huge challenges in terms of financial and human resources. In general, the transfers from central state budgets to local governments are – with only few exceptions – rather disappointing<sup>2</sup>. Moreover, the local governments are only seldomly allowed to compensate their incomes by the creation of a local tax system, which could relieve a part of their financial sorrows.

As such, the relatively limited decentralization of financial means plays a crucial role in the political maneuvering space of local government. The same holds for an associated problem, i.e. the so-called subsidiarity issue. Many Latin American local governments had, almost always, (some) authority in “traditional areas”, like e.g. street-cleaning, garbage collection, the administration and operation of slaughterhouses, bus stations, or public parks and markets. Also, municipalities possessed some local maneuvering space in the licensing of economic activities and/or building permits. As to many other areas however, the prime authority on local decision-making rests with the sectoral ministries of the state (like Health, Education, Public Works, Environment etc.) or with specialized state-organizations (such as Electricity Boards). This often means that the municipality does not have the final decision-making powers as to urban planning and road building, the provision of electricity or (piped) water, the attraction of new industries, the construction of schools, hospitals, clinics (etc.). In fact, these subsidiarity problems often hamper (or even block) the opportunity of local authorities to really “deliver” what was proposed in their local development plans. And such problems are becoming even more complex if different line ministries are involved. As to decision-making on local development in the

2 As to the effects of fiscal decentralization it is very important to clearly distinguish between Federal States and Unitary States. Thus, UCLG data (2008) show that, from the financial flows available for the sub-national governments, the so-called intermediate levels (i.e. Provinces, Departments) in Federal States receive by far the largest share. In the other, so-called Unitary States, the local level authorities are not necessarily better off. On the contrary, available data show that newly crated local responsibilities did hardly coincide with a seriously improved distribution of financial transfers.

Table 2: Examples of the different mandates of local and central authorities in four Central American countries

Action	Guatemala	El Salvador	Nicaragua	Honduras
<b>Development planning and infrastructure construction/maintenance</b>				
Urban Planning	Municipality and BANVI <sup>1</sup>	Municipality and Central Government	Central Government	Central Government
Drinking water systems	Municipality in urban areas; UNEPAR <sup>2</sup> and INFOM <sup>3</sup> in the rural areas	Central Government	Central Government (with some municipal assistance)	Central Government
Road construction	Municipality	Municipality and Central Government	Municipality	Central Government (and municipality for the delivery of the work force)
<b>Public services</b>				
Street cleaning	Municipality	Municipality	Municipality	Municipality
Bus Terminals	Municipality	Municipality	Municipality	Municipality
<b>Social services</b>				
School construction	Central Government	Municipality and Central Government	Municipality and Central Government	Central Government; Municipality for the delivery of the work force
Health	Central Government	Municipality and Central Government	Municipality and Central Government	Central Government; municipality for the delivery of the work force
<b>Public security services</b>				
Police	Central Government; limited role for municipality	Central Government; limited role for municipality	Central Government	Central Government; limited role for municipality
Fire Brigade	Municipality	Central Government	Central Government	Central Government; limited role for municipality
<sup>1</sup> BANVI: Banco Nacional de la Vivienda <sup>2</sup> UNEPAR: Unidad Ejecutora de Acueductos Rurales <sup>3</sup> INFOM: Instituto de Fomento Municipal				

Source: Abridged and adapted from CORDOVA MACÍAS (2003, pp. 222-224)

region of Lake Petén Itzá Northern Guatemala, SALGUERO (2009) showed how winding and slippery the bureaucratic road may become when decisions have to be taken in consent between the municipality and fifteen other, locally present, government institutions, which represent the interests of different ministries.

The problems, perspectives (and the little progress made) with respect to the subsidiarity problem has not drawn a lot of attention of researchers. Table 2, which is excerpted from the work of CORDOVA MACIAS (2003), clearly shows the differences in Central American subsidiarity systems. In order to grant local governments more leeway in their development efforts it is of utmost importance that the current subsidiarity problems are also put in the administrative decentralization equation (which henceforth should also have implications for the local authority's budgets). In this respect, a comparative analysis of the changes in the subsidiarity structure of Latin America's political systems since the beginning of the 21st century seems very urgent indeed.

Many local governments were (are still) struggling with capacity problems to perform their new developmental tasks properly, more especially in the small towns and in rural municipalities. That is why local NGOs did often step in to substitute the local state in the provision of basic needs. These organizations have often also been contracted by local authorities to realize the *estudios diagnósticos*, to organize the *talleres participativos* that should provide the input for the *planes municipales de desarrollo*, to actually prepare these plans (as well as the so-called *planes operativos anuales*). As such it is not likely that the role of these external organizations will soon be fully taken over by "the municipality", especially not at the bottom of the settlement hierarchy. Still, the strengthening of local institutional capacities through upgrading-programmes is an urgent need, if only to have well-informed municipal officials and civil society representatives participating in consecutive discussion rounds as to the municipal development plan. In this respect, quite a few successes have also been booked through international municipal cooperation (see BONTENBAL 2009; BONTENBAL and VAN LINDERT 2008, 2011). There is, as always, also a snag here, which urgently needs to be amended. In many cases municipal capacity building is severely hampered by (sometimes massive) staff rotations that take place after local elections. Unless precautions are taken, these very staff rotations easily result in mere destruction of capital, when an important share of the recently capacitated staff is laid off, in favour of new, non- or less-capacitated employees.

## 6 Local governance and participatory development?

An important step in the process of political transformation in Latin America was the introduction of local elections, which to a large extent took place between the early 1980s and early 1990s. Between 1991 and 1995, Paraguay, Nicaragua, Chile and Panama were the last countries in the region where mayors and councilors were elected. The newly

Table 3: Local development planning: instruments, decision-making types and actors

Instruments ("What?")	Political decision-making ("How?")	Actors ("Whom?")
Diagnosis	<b>"Centralized Model"</b> Municipal government (supported by its professional staff) plans and implements the (local development related) policies and approaches.	Municipal Government
Local development plan		Local development councils and/or advisory boards
Politics of local development	<b>"Decentralized Model"</b> Municipal government (supported by its professional staff) plans and implements the (local development related) policies and approaches, together with representatives of local civil society.	Civil society organizations (CSOs)
Local development programmes and projects		Entrepreneurs and firms
(Annual) operational plans		Trade Unions
Evaluation and follow-up	<b>"Participatory Model"</b> The planning and implementation of policies and approaches takes place through participatory decision-making procedures with local stakeholders, with municipal government in a supporting and accommodating role.	Non governmental organizations (NGOs)
New Planning cycle, etc.		Local Population

Source: Adapted from ARROYO (2001, p. 106)

elected municipal leadership and its representative councils could operate within the framework of recently developed administrative and territorial jurisdictions, often embedded in the so-called *leyes orgánicas*, which embodied the new institutional regimes.

As is perfectly clear from Latin America's ample literature on *Desarrollo local*, there is little doubt that a very important role is reserved for local governance and involvement of the civil society in decision-making. In the process, many authors even give an essential role to "civic participation" (see e.g. ALTSCHULER 2006; VILLAR 2007). Unfortunately, it is far from clear what precisely constitutes this *participación ciudadana*. The definitions and concepts used by Latin American researchers differ enormously and the variation in *ámbitos participativos* is huge. Cutting through the hedges of Latin America's political landscapes, ARROYO (2001) simplified the existing differentiation, by presenting three *voluntades políticas* in local government (Table 3). Thus Arroyo perceived a centralized system, in which the municipal government takes the sole responsibility for decision-making, planning and implementation (hence from diagnosis to the start of a new plan-

ning cycle), without involving local stakeholders. In the so-called decentralized system, the municipal government is sharing (some) responsibilities with other locally present groups, i.e. stakeholders, often merely in consultative ways. Only in the participatory system the local decision-making process is expressly articulated in consultation with local actors/stakeholders, ideally in all phases of the planning cycle.

During the past decade, quite a few instruments and mechanisms have come into being which, well-fitted in existing legislation, were aimed to support local democratic decision-making. In this respect one might think of institutionalized rounds of consulting, open meetings of the municipal council, development committees, plebiscites (etc.), often precisely directed at local development planning efforts. Unfortunately, in many Latin American countries, the actual participation of inhabitants or local stakeholders is fairly limited, while their direct political influence on local policy-making remains relatively limited. In fact, so it seems, civic participation remains to a very large extent limited to consultative activities within ARROYO'S *sistema descentralizado*, while systems that are coming close to the participatory system are only scantily available (Brazil and Bolivia perhaps being the main exceptions). Research has shown that civic participation often involves only a very small part of the local population. In this respect, the Programa Estado de la Nación-Región (2008) lists for all Central American countries participation percentages that are often even lower than 4 percent. And the forms in which the participation is organized are often managed by *organizaciones de base local*. All by all it seems, that – within Arroyo's decentralized frameworks – the mechanisms to capture the voice of the people are strongly directed and controlled by local government (and hence drifting away a bit from what originally was meant by “civic participation”). Moreover, this institutionalized embeddedness of the civic participation also gives a strong position to powerful local stakeholders and other brokers. Indeed, the popular participation which in the rhetoric of local government and its associated organizations is painted as *democracia directa*, is in the nitty-gritty reality often not too far away from the traditional models of the *democracia representativa*.

## 7 Looking back and looking forward

During the past two decades, most countries in Latin America improved their economies (somewhat) from the slump before. Also, they consolidated their democracies, as exemplified e.g. by state reform, administrative decentralization and the rise of the municipality (*municipalización*). Throughout the subcontinent, the inclusion of local and regional stakeholders in the development process was articulated, among others by a variety of innovative initiatives in local governance and local development, from the creation of consultative local bodies, to the acceptance of the role of social movements in local policy, the creation of new, “indigenous municipalities” and even the emergence of new spatial entities across provincial (or even national) borders. The new tasks for the municipi-

palties triggered the emergence of local development thinking in Latin America, a train of thought that over time developed at some “distance” of the so-called Local Economic Development school that had come into being in North America (and Western Europe). Whereas the “Northern” LED-approaches maintained a clear economic focus, the Latin American local development debate rapidly opened up, also embracing different kinds of societal and political elements.

In due course, the Latin American debate took on avalanche proportions, fanning out in an impressive diversity of ideas, approaches and strategies. Remarkably though, a large part of the currently available literature on local development has a distinct literary-philosophical and abstract nature, less dealing with the nitty-gritty planning reality. Thus, even after some twenty years of debate, which resulted in a stunning amount of literature, it still remains to be seen whether “local development” actually leads to substantial, tangible improvements in living conditions, especially with respect to the poorer segments of local society.

Undoubtedly, the many stumbling blocks that have to be overcome in the process all have their complications. And certainly, local development approaches should not be perceived as a panacea, nor should they be seen as jacks of all trades, which are capable to successfully combat highly different local ills and woes. If anything has become clear by now, it is that successful local development plans start from a well-contextualized, territorial perspective, clearly taking its productive and competitive capacities into account, while incorporating participatory approaches. As such, this means that successful local development plans will show quite some elements that are tailored to a specific (spatial) situation, steering clear from nationally or regionally defined blue-print models. At the same time it becomes more and more pressing to collect hard, empirical evidence of real-life, local development planning processes and their results, preferably with a comparative and longitudinal approach. There is still a lot of work to be done.

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**Human-Environment Relations, Resource Use, Vulnerability and Sustainability in Rural Regions**



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## **Landscape Structure and Land Use Systems as Pre-Colonial Heritage? A Contribution to the Discussions on Human-Environment Interrelations by the Example of the Llanos de Mojos (Bolivia)**

Richard Hastik (Innsbruck), Clemens Geitner (Innsbruck), Martina Neuburger  
(Hamburg), Claudia Stöcker (Innsbruck)

### **Abstract**

Intensified research on human-environment interrelations in the Amazon shows the wide ranging influence of past land use systems and questions the idea of Amazonia as an untouched region. Many studies reveal pre-colonial heritage such as Amazonian Dark Earths, focusing their characteristics and genesis. However, little attention is paid to current land use systems. The presented study emphasises on the analysis of landscape structure and land use systems in the Llanos de Mojos (Bolivia) as natural ecosystem transformed by historical and recent human action/activities that – in turn – was and is influenced by environmental conditions as well as perception and knowledge of local farmers. Geodata analysis gives an overview on landscape elements of the region and shows that main parts of the lowlands are anthropogenically altered. Integrating local farmers' view of soils into the study allows to clarify human-environment interrelations from different angles and reflect scientific results. By conducting field work considerable differences of underlying concepts of local and scientific knowledge about soils and adequate soil management occurred. Nevertheless, both scientific analysis and farmers' statements show that soil fertility is elevated on pre-colonial ring ditches. Preliminary results indicate that this fact might arise from practices of former inhabitants which are comparable to the creation of Amazonian Dark Earths.

### **1 Changing paradigms on human-environment interactions in the tropics**

Climate change, loss of biodiversity and rapid deforestation are processes which increasingly get acknowledged as substantial environmental problems on a global scale (IPCC 2007; MALHI et al. 2008). Human forces and their impacts on global environmental changes are main topics of the corresponding discussions. However, this perception has experienced several changes. Especially in the tropics, ascriptions regarding human-environment interactions have changed in history. For a long time, studies focussed on the low soil fertility, which contrasts to the abundant vegetation of tropical ecosystems (MEGGERS 1971; WEISCHET 1980). Influenced by the ideas of natural determinism the Amazon was seen as a disadvantaged region for human occupations. As a consequence, pre-colonial population density and social complexity were supposed to be low. Discus-

sions of the so called underdevelopment of many tropical regions in the context of modernisation and dependency theory regarded local (or indigenous) knowledge and practices as destructive, outdated, inefficient and as an obstacle for development strategies (AGRAWAL 1995; SILLITOE et al. 1998).

This view changed at the beginning of the 1990s, especially at the UNEP Conference in Rio de Janeiro 1992. Tropical rainforests got considered as ecological hot spots due to their high biodiversity and their importance for the world climate. Since then, it was more and more realised that anthropogenic interventions often lead to irreversible land-cover changes, carbon emissions and social disparities (IPCC 2007; MALHI et al. 2008; PNUD 2008). Environmental and social problems were increasingly recognised and discourses shifted to holistic and sustainable solutions. Indigenous knowledge and practices were recognised as environmentally adapted and indigenous peoples got promoted (often with political motivations) as “environmental safe guardians” (MÜNDEL 1987, p. 9). Empowerment and participation of local communities started to be fostered and their (ecological) knowledge started to get recognized (SILLITOE et al. 1998). Intensified works on Ethnecology pointed out that the addition of different knowledge systems can produce better results (MÜLLER-BÖKER 1995, p. 376).

## **2 Research on Amazonian Dark Earths and the earthworks of Mojos**

Recent studies on Amazonian Dark Earths (Terra Preta do Índio) and earthworks of Mojos had a notable impact on the perception how pre-colonial cultures coped with their environment. Insights on both subjects question the idea of the Amazon as an ecologically disadvantaged region and challenge the theory of an anthropogenic untouched Amazon (HECKENBERGER et al. 2003).

Focussing on Amazonian Dark Earths, those anthropogenic modified soils show that pre-Colonial cultures knew how to increase soil fertility in the longer term by applying special burning and land management methods (WOODS and DENEVAN 2009, p. 1). Found at former settlement areas, Amazonian Dark Earths occupy about 0.1 to 0.3% of the lowland forests while sizes reach from less than 1 ha to many square kilometres reflecting former settlements and their relocation over history (SOMBROEK and CARVALHO 2002, p. 130). In contrast to surrounding Ferralsols and Acrisols (according to FAO 2006) typically found in the Amazon, Amazonian Dark Earths are distinguishable by their dark colour and a high carbon/humus content, which retracts nutrients, moisture and biological activity on the long term (WOODS and DENEVAN 2009, p. 1). High rates of long lasting pyrogenic carbon can be attributed to special fire management methods such as incomplete combustion and decreased availability of oxygen. Low intensity “cool” burning of organic residues (residual slash, crop residues) was the main component for Amazonian Dark Earth formation besides the addition of ash and incompletely burned materials and

scattering of cooking remains. Carbon found in Amazonian Dark Earths could be dated back to 450 BC (PETERSEN et al. 2001, p. 100), indicating that soil carbon pools persist over thousands of years. Pushed by the ongoing debate on carbon sequestration, research on Amazonian Dark Earth was intensified during the last decade. Most of the research is concentrated on chemical soil properties and archaeological site descriptions; however, only few studies are contributed to the relationship between the local population and their environment in general or with the landscape and soil related heritage specifically. GERMAN's (2003, 2004) studies focus on the dynamic of historical circumstances that influenced Amazonian Dark Earth creation and management by integrating the agronomic knowledge of Amazonian Dark Earth peasants near Manaus. Her results show that Amazonian Dark Earth generation and socioeconomic developments were mutually depended, for instance in the context of crop selection. Crops originating from the Amazon (especially root crops) show a weak performance on Amazonian Dark Earths while new crop species introduced from other parts of America (Maize, Tomato) required the anthropogenic increased soil fertility.

Most research on Amazonian Dark Earth was focused on the Brazilian Amazon but few attention was given to tropical wetlands such as the Llanos de Mojos (=Mojos) despite their consideration as centres of biodiversity (JUNK 2003). Situated in the northern lowlands of Bolivia (Department of Beni) between the Andes in the south-west and the uplands of the Brazilian Shield in the north-east, Mojos reaches an extension of 150.000 km<sup>2</sup> and is classified as the biggest seasonally inundated lowland of the world (LOMBARDO et al. 2011a, p. 503). Mojos is considered as ideal area to study past human-environment interactions in the Amazon due to the numerous archaeological sites. Especially, the huge number of pre-colonial earthworks is regarded as a further indication that former societies did not only passively adapt to environmental constraints but also modified their environment in a large-scale. Additionally, LOMBARDO et al. (2011b) could show that the variety of anthropogenic earthworks is connected to regional environmental conditions. Raised fields, characterised by large platforms of elevated surface, were constructed in seasonally or permanent wetlands in the western part of Mojos, reaching a length of several hundred metres, a wideness of up to six metres and a height of one metre (DEVAN 2003, p. 244). Field ages were dated up to 400 BC, indicating the long lasting influence of past inhabitants on the landscape of Mojos (ERICKSON 2006, p. 235). According to ERICKSON (2008, p. 171), these fields fulfilled several functions such as improved drainage, soil amelioration and increased nutrient production. LOMBARDO et al. (2011a) question furthermore if raised fields served to mitigate risks of extreme weather situations. Also other types of earthworks have been identified such as causeways which were constructed to connect villages. Canals connected rivers and attracted animals for hunting or fishing (BARBA 2004, p. 23; LOMBARDO et al. 2011a, p. 504; WALKER 2008, p. 936). In northeast Mojos ring ditches indicate further landscape alterations by past inhabitants with dimensions reaching up to several 100 metres of diameter, 4.5 metres depth and 10

metres wideness (ERICKSON 2010, p. 652). Purposes for the construction are still being discussed, historical documents and excavations indicate a defensive use for settlements in combination with palisades, but also water storage functions or a symbolic value for power demonstration are speculated (ERICKSON 2010, p. 627). Some ring ditch sites can be associated with the occurrence of Amazonian Dark Earths as they served as former settlements areas (ERICKSON 2008, p. 170-171).

Both Amazonian Dark Earths and earthworks of Mojos described above demonstrate the fragility of local knowledge and highlight how external influences such as the European colonization can change human-environment interaction patterns within a short period of time. Most research is focused on physical and chemical soil properties, past management methods and pre-colonial relicts. However, little work is dedicated to actual inhabitants, their land management and knowledge in relation to the pre-colonial heritage. This seems curious regarding the already mentioned acknowledgement of local people's ecological knowledge. Therefore, the presented study will scrutinize emerging possibilities and problems by integrating local or indigenous people and their environmental knowledge into scientific research on recent and past human-environment interrelations.

### **3 Questions of interest and applied methods**

Based on searching and analysing digitally available Geodata and on empirical field work in the province of Iténez (Bolivia), the study focuses on landscape structure and land use systems as result of long-term human-environment interactions. We scrutinized differences between local people's ecological knowledge and the interpretation of their environmental perception by researchers. Our emphasis was put on approaching an integrative concept, as methods from social and natural sciences were applied to collect qualitative and quantitative data. Results are structured into three topics, the first will give an overview on the research region while the second and third focus on agricultural practices and ecological knowledge. As work is still in progress, results on the latter topics can only be previewed:

- How can the natural background and human influences be differentiated by describing the landscape structure of the province Iténez using free available Geodata? (4.1)
- How do local people regard their interactions with the environment, especially soils? Can this view be interpreted from a scientific point of view, and if so, how? (4.2)
- Which pre-colonial influences can be revealed in the research area? Do local people pay special attention to pre-colonial earthworks and Amazonian Dark Earths? (4.3)

Free available raster- and vector-based geodata prepared by Texas University (Geobolivia 2010) were used to characterise shape and distribution of landscape elements. This

huge quantity of high resolution data sets available helps to analyse the spatial spreading of vegetation, soils, water bodies, geological structures and settlements using tools like neighbourhood statistics or shape index. Data processing included projecting and classifying, followed by data analysis in ESRI ArcGIS 9.2. Results were combined with present research findings in the context of recent and historical land use systems. Political and NGO representatives were interviewed to gain an overview on the research area and study-relevant topics. Soil profiles (n=54), soil laboratory analyses and a soil mapping were conducted to describe the research area from a pedological point of view. Surveys in the villages of Jaciaquiri and La Embrolla revealed socioeconomic settings on a household level. Agricultural practices and soil-relevant knowledge were studied by performing semi-structured interviews (n=16), field surveys and group discussions according to former experiences in Ethnopedology (BARRERA-BASSOLS et al. 2009; GRENIER 1998; OUDWATER and MARTIN 2003).

#### **4 Landscape structure of the province Iténez and its ecological implications**

The province Iténez can be divided in two parts, upland dense forest vegetation and lowland savannas. The former is situated on the Brazilian Shield while the latter is located on a low-lying plain of quaternary and tertiary sediments. Our work focuses on the seasonally inundated lowlands covering about 16,000 km<sup>2</sup> in the province of Iténez which makes up 16% of the total Llanos de Mojos area. All rivers drain the upper Madeira watershed, which is part of the Amazon watershed. The annual precipitation rate of Baures accounts for 1400 mm (<http://www.worldclim.org/>; HIJMANS et al. 2005) and shows a high seasonality. Large-scale inundations occur during the rainy season between October and April. Clayey soils and a plain surface amplify the effect of annual floods in the Llanos de Mojos. Nevertheless, not the whole area is inundated; an exception is constituted by small elevated islands. The following section gives an overview on landscape elements characterising Mojos, refers to specific setting of our research area near Baures and scrutinises anthropogenic influences.

##### **4.1 Forest Islands**

As shown in figure 1 the so called Islas are distributed in a clustered pattern and can be distinguished by geological structures into Islas with granite bedrock and Islas of former river levees (sediment). The first are found in the eastern part and show cleft margins, huge extents and medium distances to flowing waters. Most forest islands near Baures and Huacaraje are associated with granite bedrock Islas. The second are situated close to watercourses at former river levees or fragmented gallery forests and consist of fluvial sediments. Many Islas are actually used for slash and burn agriculture and are therefore anthropogenically altered. The natural Isla vegetation can be described as dense tropical



forest reaching heights of 15-20 m (NAVARRO AND MALDONADO 2002, p.169). However, it is difficult to define the natural characteristics of Islas as they were exposed to long term transformations in history due to the activities of pre-colonial settlers (ERICKSON 2008, p.158).

#### **4.2 Non-forested inundated lowlands**

More than 80% of the investigation area is inundated during rainy season. Most of those lowlands exhibit herbaceous and shrub vegetation. The anthropogenic influence on the extent of non-forested lowlands is questionable as large parts are used for extensive cattle ranching. Periodical burning in favour of ranching activities has a strong impact on the constitution of the vegetation such as inhibited tree growth. This area is well known as Pampa and has many different forms reflecting the variance of topographic situations.

Low-lying troughs and cut-off meanders never desiccate during the dry season which enables the existence of aquatic vegetation. These areas are qualified as Curichi and can also be found in the area of Huacaraje. Landscape elements characterised by their micro relief of Gilgai-structure developed by hydroturbation of Vertisols are mentioned as Sartenejal (LANGSTROTH 1996, p.166). High-lying hummocks are inundated infrequently while swales are flooded during the rainy season generating different local characteristics on a small scale. Pampa *sensu stricto* stands for areas which are dominated by graminoids without shrub growth (Geobolivia 2010). The composition of species is determined by anthropogenic annual burning after the rainfall period and extensive cattle ranching during the dry season. Large parts of the pampa near Baures are also dominated by graminoids due to the dominance of cattle ranching activities.

#### **4.3 Gallery forests and forested inundated lowlands**

Nearly 40% of the province Iténez is classified as forested landscape including gallery forests and inundated lowland forests. Both whitewater and blackwater rivers are existent in Mojos influencing soil fertility of adjacent areas (mostly gallery forests) in different ways. The continuous input of nutrient-rich whitewater with a high rate of sediment-load results abundant vegetation whereas the soil fertility is reduced by acid blackwater rivers. The former are present in the western part and the latter in the eastern part of Iténez, in the Region of Baures both can be found.

Most parts of the lowlands are used for cattle ranching, nevertheless also large inundated lowland forests can be found. Different types are known such as dense inundated lowland forest characterised by its closed forest cover and regular inundation (also known as Várzea). In contrast savannah forests exhibit a lighter vegetation cover and represent a transitional form between Pampa and dense inundated forests. This landscape element

is dominated by widespread woody species like *Copernicia alba*, *Mauritia flexuosa* or *Euphorbiaceae* sp. without undergrowth (Geobolivia 2010). Here too, anthropogenic influences play an important role as many savanna forests are a result of protecting landscapes e.g. the scientific, ecological and archaeological reserve Kenneth Lee. In the region of Baures and Huacaraje most lowland forests can be attributed to savannah forests due to the low occurrence of woody species.

#### 4.4 Human impact on landscape elements of Llanos de Mojos

Analysing landscape elements helps us to scrutinize the wide ranging human influence in our research area. Inundated forests demonstrate that the lush growth of trees in the Pampa s.s. is not only prevented by annual inundations but also by recent slash and burn and cattle farming. The existence of ADE or archaeological relicts like potsherds points at far-reaching anthropogenic modifications of Islas. In consideration of present research results (LOMBARDO and PRÜMERS 2010; ERICKSON 2008, 2010) and the distribution of landscape elements, primarily Islas, savanna forests and Pampa s.s., can be assumed that the Llanos de Mojos are strongly determined by historical and recent land use systems.

### 5 Agricultural practices and environmental knowledge of peasants

We focussed most of the field work on the villages of Jaciaquiri and La Embrolla (municipalities Baures and Huacaraje). The bigger village of Jaciaquiri (50 households) exists already more than one century while the smaller village of La Embrolla (16 households) was only founded about 50 years ago. Both villages are situated on forest islands which are not exposed to seasonal flooding (Figure 2). Large parts of the elevated land are cultivated, villagers organise land distribution themselves as land is owned collectively. The “chacra” agriculture is the most important activity in both villages characterised by rotational slashing and burning as performed by many peasants in the tropics. Small parts of land are cleared and burned for cropping, cultivation periods last for several years until fertility declines. The main staple crops are maize (*Zea mays*), cassava (*Manihot esculenta*), rice (*Oryza sativa*) and bananas (*Musa spp.*). Exhausted fields are abandoned until vegetation and nutrients could recover. During that time other parts of the land are rotationally cultivated. This slash-and-burn method, typical for the Amazon region, does not rely on external inputs and is not cost-intensive in contrast to mechanized agriculture.

Instead of describing special agricultural practices in more detail, in the following chapters results will be previewed based on four topics characterising our work at the interface between scientific and local knowledge. The following points did not only affect our work on local agricultural practices and soil knowledge but also influenced the study on local people’s perception of pre-colonial sites.



Figure 2: Village map Jaciaguiri  
 Source: Houses based on field mapping (December 2010), vegetation based on Google maps aerial photo (2003); Richard Hastik (2011)

## **5.1 Broad environmental view of local farmers**

In contrast to the ongoing specialization in the field of science, local ecological knowledge can be generally characterised by its broad view. Field surveys show that soils were often described in correlation with vegetation, crop performance or weeding. A participative soil mapping performed in the village of Jaciaquiri resulted in a mixture of soil types, vegetation units and land uses. High soil quality was described mainly by high crop production or vegetation height in case of fallowing. However, this broad, practice-oriented environmental view is normally limited to agronomic productivity or possible uses as revealed within other researches (ERICKSEN and ARDON 2003; KRASILNIKOV and TABOR 2003, p. 209). It is therefore a question for future research whether and to which extent farmers perceive pre-colonial influences mainly in correlation with possible uses and in combination with the local environment.

## **5.2 Performative and culturally embedded knowledge**

While studying agricultural practices in the field allowed gaining insights on local land management, discussing those practices was more difficult as farmers had problems to reflect and verbalize their knowledge. BIRMINGHAM (2003, p. 489) mentions in this context the importance of education for the ability of verbalizing experiences. This might be relevant as no agricultural school exists in the area and knowledge is passed between generations by practicing on the fields. Knowledge that is mostly visible by practices can be described as “performative“ in contrast to other types of knowledge such as propositional, experiential and epistemological (MINGERS 2008). Focusing on the level of explicit propositional environmental knowledge was difficult as farmers knew about interrelations when they were accompanied in the field but few consciously reflected their practices. Other scholars reported further difficulties in studying local ecological knowledge due to its cultural internalization (RICHARDS 1993; OUDWATER and MARTIN 2003, p. 396). Local environmental understandings must be reflected upon individual cultural realities to avoid misinterpretations (SILLITOE et al. 1998, p. 192). Examining cultural backgrounds and revealing propositional and epistemological knowledge is time intensive and therefore difficult to reveal within limited time for field studies like our research. Nevertheless, alternative approaches such as the discussion of soil samples (Section 6) helped to get a first overview for further studies.

Francisco Fernandez (Jaciaquiri): “[...] *Depleted soils are soils where crops don’t grow and fruits are small [...]*”.

Dionisio Leon (Baures): “[...] *Depleted soils have many weeds and are harder (but colour doesn’t change) [...]*”.

Angel and Cencilia Jansen (Alta Gracia): “[...] *Depletion can be recognised when soil has a stronger colour, is harder and yields decline; sand content is higher which increases the thread of desiccation [...]*”.

Figure 3: Statements made by farmers in relation to soil depletion  
Source: Own compilation

### 5.3 Common characteristics versus internal disparities

Many studies on ethnopedology focus on common characteristics of local land management practices and soil knowledge while little attention is paid to internal differences. BARRERA-BASSOLS and ZINCK (2003, p. 178) refer in this context to “differences in wisdom [...] according to age, gender, social status and experience”. OUDWATER and MARTIN (2003, p. 394) relate further disparities to both physical and conceptional differences. The physical divergences can be explained by the fact that knowledge is based on different environmental conditions. The conceptual part emphasizes on different knowledge levels as farmers might have different personal approaches to agriculture due to the individual socioeconomic settings. The following example of statements shows the individual perception of soil depletion depending on the farmer interviewed. All three farmers had profound experiences in agriculture (Figure 3).

The different perceptions of depleted soils can also be attributed to the structure of local knowledge which is defined and developed by the users themselves upon their individual setting. This bottom-up development of knowledge contrasts to science which is normally shaped by a top-down validation of “true” or “false” (SILLITOE et al. 1998). Thus it is doubtful to focus only on common characteristics of local management and knowledge as diverging statements might also be relevant due to the individual setting and experiences of each farmer.

## **5.4 Valorisation of knowledge**

Another sticking point for studying local ecological knowledge is the valorisation of local knowledge by the users themselves. Many farmers devalued their own agricultural and ecological knowledge as unfounded in contrast to science and felt embarrassed to talk with scientists about their experiences. Several discussions were necessary to point out that the aim of this research was to study their knowledge as we were often viewed as “experts” and asked for agronomic advice. It was not only their knowledge which was devalued, also local practices were viewed as minor in contrast to agroindustrial solutions. Self-made organic fertilizers were for instance put below chemical solutions and mechanized agriculture was generally regarded by its advantages in contrast to the practiced no-till system. This optimistic view on mechanized agriculture contradicts to the FAO (1995: 47) which describes no-till systems as ideal for Lixisols which can be found in the research area. However, the preference of mechanized agriculture by farmers also results from the decreased amount of manual work involved. But nevertheless, it would be naive to ignore the influence of power and politics on the valorisation of knowledge (BRIGGS and SHARP 2004). Focussing on the region of Baures several agronomic courses promoted by the state teach farmers the “right” way of performing agriculture. Interviews conducted indicate that the value of knowledge seems to be strongly divergent between scientifically trained agroengineers and “uneducated” farmers. Further studies should put further emphasis on that misbalance and reveal the valuation of local farmers’ experiences within agronomic courses. Looking at the valorisation of local knowledge links can also be established to the discourse on global scale, recognizing indigenous knowledge during the last centuries but still paying little attention to local-based actors and their knowledge.

## **6 Impact of pre-colonial heritage**

Villagers helped us to identify and study several pre-colonial ring ditches in the municipalities of Baures and Huacaraje. The farmers we interviewed were aware of the anthropogenic origin of the ring ditches which might also be attributed to the nearby presence of the archaeological reserve Kenneth Lee, a centre for research on pre-colonial earthworks. Local farmers could not give any explanations in respect to possible former uses of the ring ditches. Our emphasis was put on comparing three ring ditches, two under cultivation and therefore exposed to recent human activities and one further covered by forest and little influenced by humans at least during the last decades. The cultivated ring ditches are situated near the villages of Jaciaquiri and Alta Gracia while the third can be found at the Finca “La Tranquilidad”. All three ring ditches are located on elevated areas on the Brazilian shield which are not exposed to flooding. Diametres reach from approximately 300m (Tranquilidad, Jaciaquiri) to less than 200m (Alta Gracia). We excavated 54 soil profiles and compared 72 top soil colour samples which are an important

feature to identify Amazonian Dark Earths (KÄMPF et al. 2003, p. 87). Dark top soil colours and artefacts (potsherds) indicate that ring ditch soils are strongly modified by inhabitants. Nutrient analyses show an increased fertility of soil samples collected at ring ditch sites. In contrast to other samples, especially K, P and Ca values are increased. This probably indicates the existence of Amazonian Dark Earths according to LEHMAN et al. (2003, p. 106). A recent work by WALKER (2011) supports this theory of Amazonian Dark Earths inside ring ditches. PH values are even higher than in central Brazilian Amazonian Dark Earths which can be attributed to the fact that Lixisols in Mojos are generally less acidic than Ferralsols of the central Amazon. Ongoing analyses on the composition and stability of organic matter fractions will give further information about this increased fertility.

High nutrient values assessed by laboratory analyses within ring ditches can be supported by statements given by local farmers. Many rated crop growth and cultivation periods as more favourable on ring ditches. One farmer even mentioned that ring ditches can be cultivated up to 20 years in contrast to other fields where soils deplete after few years of cultivation. Statements on crop performance in case of droughts or floods are however divergent. Agricultural practices performed by farmers did not differ in respect to the location of the ring ditch in Jaciaquiri except for longer cultivation periods. Also crop selection did not differ although crop performance of cassava and bananas performance was rated worse on Amazonian Dark Earths by Caboclo farmers in Brazil (GERMAN 2003). Recent agricultural practices carried out in Mojos contrast therefore to pre-colonial practices (e.g. control of burning temperatures and available oxygen, carbon production) (STEINER 2007).

We accompanied field surveys by soil sample discussions with 16 farmers to gain more comparable data. For this purpose soil samples originating from different locations were packed into plastic bags and discussed with farmers. However, results must be regarded carefully as this method contrasts with the broad environmental view of local farmers. Nevertheless, a first overview on the perception of different soil types could be gained indicating that farmers are aware of different soil types, their properties and possible uses. Samples collected from ring ditches were identified as “tierra negra” due to the dark colour and described as highly fertile, suitable for all crops (including cassava and banana). Some farmers use tierra negra as an ingredient for organic fertilizer. All other soils were described as less fertile but in contrast statements varied considerably. Although soil assessments of local farmers underlie different concepts, most of their statements could be confirmed by soil laboratory analyses. This correlation supports the integration of local farmers as “experts” of their environment and provides links for development strategies, especially in context of the already mentioned devaluation of local knowledge and its performative character.

## 7 Conclusion

The main objective of this work was to study influences of the pre-colonial heritage on the landscape structure and the local population. Using free available geodata enables an overview of the landscape structure and helps to scrutinize possible anthropogenic influences on the environment. Including local people as “experts of their own environment” helped to study recent human-environment interrelations. Scientific methods and results can be reflected by integrating the different environmental perception of local people. However, integrating local people can also result in conceptual problems, especially when time for field studies is limited. Looking at ring ditches, soil laboratory analyses as well as interviews indicate an increased soil fertility which could be attributed to the land management of former inhabitants and the resulting presence of Amazonian Dark Earths.

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## **Agriculture and Cattle Frontier Advance and Variation of Poverty in the North of the “Gran Chaco Argentino” during the 1990s**

Pablo Paolasso, Julieta Krapovickas and Fernando Longhi  
(San Miguel de Tucumán)

It is forgotten that cities have not radiated their progress towards the countryside, and that somewhat it has rather been the countryside which has entered them. It has entered with the people who dis-integrate from their economic and social constellation without integrating properly in the constellation of the cities. Rather, the precarious existence of the countryside is carried to the cities in the huge “tugurios”  
of the marginal populations.

Raúl Prebisch (1970, 9.3, author’s translation)

### **Abstract**

The “Gran Chaco Argentino” (GCA) is the major extension of forest and the major biomass reserve of the country and the extra tropical south hemisphere. During the 1990s this region underwent an intense process of change of land use. In parallel, a fast growth in deforestation rate was produced, an unprecedented advance of the agriculture and cattle frontier and a substitution of traditional crops (cotton, sugar cane, beans) by oleaginous (mainly soy beans) and forage crops. The increase of the soy bean and wheat crops and the intensive cattle raising in the GCA changed the physiognomy of the territory to transform it from being a marginal productive area to being an area of increasing importance within the national economy. However, the new economic activities which were introduced into the territory, and which generated great richness and important territorial transformations, do not seem to have led to genuine regional growth. Despite the important economic dynamism that the agricultural activity produced, and produces at the present time, the regional poverty rates cannot be changed. Instead, highly-profitable economic activities began to exist in the same territory as situations of extreme poverty. In this paper we therefore ask if relations between the agriculture and cattle frontier advance and the poverty conditions of the population exist. That is to say, we wonder in which way the increase of the soy bean-sown area and the increase of cattle in El Chaco are related with the advance, stagnation or decline of the poverty level. Our starting hypothesis is that the dynamism of the agriculture and cattle sector largely characteristic of El Chaco during the 1990s did not mean an improvement in the living conditions and

that, parallel to the increase of profitable activities, poverty level increases were also observed. For the analysis of the agriculture and cattle frontier advance, data from the National Agriculture and Cattle Surveys of 1988 and 2002 were used; these refer to sown surface area by crop and cattle, and distinguish between departments. The sown surface was grouped according to large extensions of crops, distinguishing the soy bean-sown surface area individually. To evaluate the poverty evolution the Index of Life Resources Privation (IPMV) drawing on data from the National Population, Families and Houses Surveys of 1991 and 2001 was used. The results show that together with a growth in the sown area (mainly with soy beans) and cattle, there was a generalized increase in poverty conditions among the GCA population. Precisely those departments that most increased their poverty in the 1990s were the ones that showed most changes in relation to the expansion of the sown area, increase in number and average size of agriculture and cattle enterprises (EAPs), and increase in oleaginous crops and cattle. These results permit us to affirm that the economic activities which developed in these departments were not effective enough to reduce poverty. On the contrary, apparently, the scanty redistribution of the profits obtained by means of these new economic activities, led to an increase in poverty level. The reasons for this non-redistributive behavior would have to be related to the presence of foreign businessmen and the weak reinvestment of the profits in the region.

## **1 Introduction**

In the last forty years an extraordinary increase in soy bean production (a six-fold increase) and global commerce (a five-fold increase) has occurred worldwide. This is explained mainly by the continuous increase of consumption in Middle and Far East countries like Iran, China, India, Pakistan and Bangladesh, which in terms of consumption overtook European countries and Japan, nations which up to the 1970s were the main consumers and supplied by the United States (PIERRI 2006, p. 54). Since the mid-1990s Argentina has become one of the main producers and exporters of soy beans. In 2001 Argentina was the third largest soy bean exporter (12.9% of the global market), the largest soy bean oil exporter (39.8%) and the largest soy bean pellets exporter (34.0%). In 2003 29% of Argentinean exports was related to soy beans and derivatives (MARTÍNEZ MAINO 2003).

The soy bean crops were developed especially in three areas: (1) the region of La Pampa; (2) the centre of “El Chaco Oriental” (Northern Santa Fe; Southwestern El Chaco and Eastern Santiago del Estero) and (3) the threshold to El Chaco (Eastern Tucumán, Eastern Salta and Western Santiago del Estero) (Figure 1). However, while the region of La Pampa showed, at the beginning of the 21st century, the best life quality level of the country, the “Gran Chaco Argentino” (GCA) appeared as the poorest area, a situation which is historical (VELÁZQUEZ 2008; BOLSI and PAOLASSO 2009a; Figure 2).

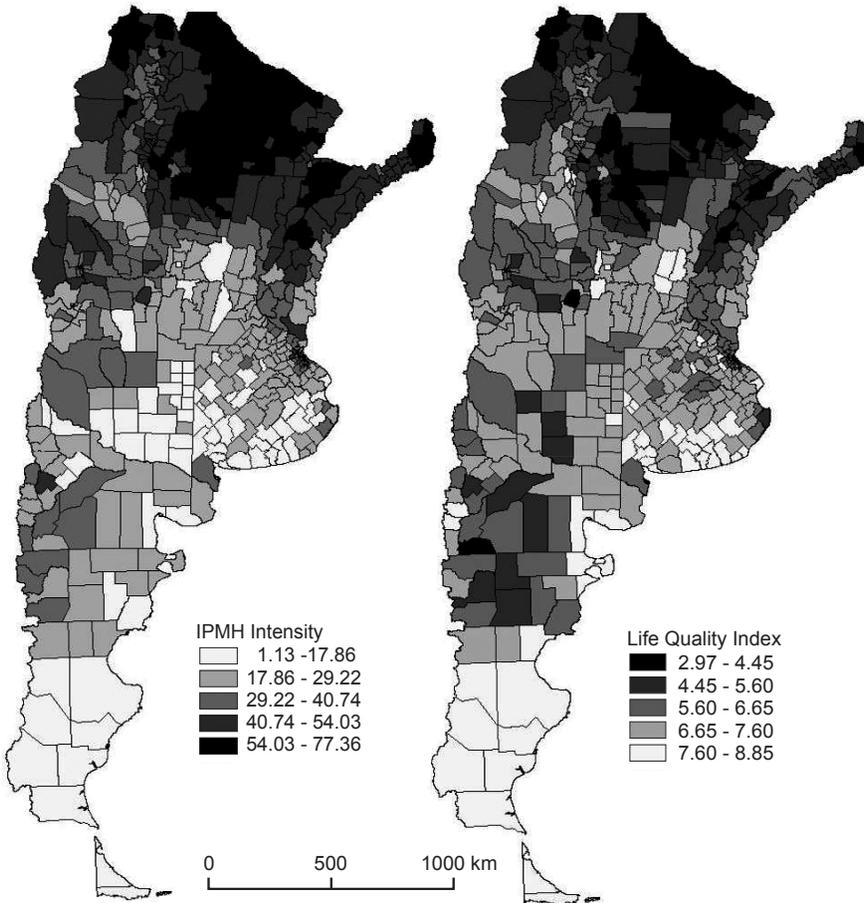


Figure 1: Spatial distribution of soy bean in Argentina (1996-2000)

Source: *La Argentina en mapas*. CONICET. Buenos Aires, 2011

URL: <http://www.laargentinaenmapas.com.ar>. Accessed: 31 Oct 2012

In addition to arguments concerning the growth of soy beans in relation to environmental consequences, or the positive effects that such growth had for the Argentinean macro economy, some authors say that this transformation in the agriculture and cattle sector and economy, far from improving the situation for the population, coincided with an increase of hunger and poverty in the country (TEUBAL 2003; PENGUE 2000; LATTUADA and NEIMAN 2005; GRAS and HERNÁNDEZ 2008). In the case of the GCA, the soy bean expanded in the areas with the worst poverty, indigence, malnutrition and child death rate levels of the country (ADÁMOLI et al. 2008, p. 18).



*Figure 2: Poverty and quality of life in Argentina, by departments (2001)*  
 Source: Laboratory of Digital Cartography, ISES, CONICET - UNT based on data of Censo Nacional de Población, Hogares y Viviendas 2001

Such aspects showed by the literature review and initial observations mentioned in this paper lead us to wonder about the relation between the agriculture and cattle frontier advance and poverty in the north of the GCA. Particularly, we are interested in analyzing whether the soy bean growth expansion permitted the improvement of the historical conditions of poverty of the population in the north of the GCA during the 1990s. To answer this question, firstly, the concept of poverty and its measurement were considered; then the context of productive change in Argentina and in El Chaco was observed; and, finally, the relationship between poverty variations of the population and the main productive transformation in the north of the GCA was analyzed.

## **2 Poverty and its measurement**

To identify and measure poverty, studies habitually focus on the severe privations of properties and services which a variable part of the population suffers owing to their low income (FERULLO 2009). However, SEN states (1997) that to trust exclusively in poverty in terms of income may hide important aspects of privation. SEN focuses on the people potentialities and the conditions which restrain the freedom to have what oneself considers rationally is worth while being and having. So a person's poverty condition is related to some level of privation which impedes him/her in the full development of his/her abilities, and even his/her freedom (FERULLO 2009)<sup>1</sup>. SEN's focus on human abilities contributes in a significant way "to understand[ing] better the nature and cause of poverty and privation, transferring the main attention of means (e.g. the rent) to the targets that individuals have and so to the necessary freedom to satisfy these targets" (SEN 2000, p. 117). SEN's contribution has been important to understand poverty as a multidimensional phenomenon in which non-monetary dimensions must necessarily be considered. According to SEN's focus, the means (income or outcome) is not what needs to be taken into account but rather the results in terms of well-being and living conditions (death rate, illiteracy, life hope, and so on) (HERRERA 2002). SEN defines poverty as: the privation of abilities, understood as "abilities" to reach certain living conditions. Because of this, the connection with income insufficiency is only instrumental.

Conceptual frames that explain the poverty problem satisfactorily do not exist (ALTIMIR 1979). The lack of the theoretical precision of the concept of "poverty" impedes consideration of the poor as a strict social group, and the descriptive nature of the concept only permits, essentially, it to be considered as a classifying social category which works as a statistic aggregate (MORENO 1995). However, in our work we consider poverty as a situation in which certain families are. This situation is not the sum of dimensions or partial aspects but the situational and structural context in which such families are, as a result of their particular insertion in the social and productive structure. This last factor is what determines the possibility of not accessing or accessing, in one way or another, determinate properties and services (MORENO 1995). Poverty is showed by means of some general characteristics of the families such as their low educational level, nutritional insufficiency and minor participation in labor activity. The latter aspect is defined at the same time by the exercise of low-production occupations, which produce scanty income and impede satisfying integrally their most essential material and non-material needs.

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<sup>1</sup> In the same way, CÓRDOBA ORDÓÑEZ and GARCÍA ALVARADO (1991) state that poverty defines an in-need situation in a vital context of human existence and it would probably be simplistic to reduce this to its economic component, but it is indubitable that in a system like ours, of utilitarian philosophy and consuming practice, each in-need situation in the vital context must be associated with a deficient material availability which must consequently form the basis of any definition of "poverty".

The material aspects of poverty continue to have their protagonists in studies about this topic. However, the non-material aspects of the poverty concept have attracted particular interest in recent years. In this context GONZÁLEZ (1997, p. 285) defines poverty as a multidimensional phenomenon, which refers to the “means of life privation and lineage loss”. However, the sources of information to study the non-material aspects of poverty, such as lineage loss, are scanty and only limited to surveys of relatively small populations. The economic aspect of the measurement of poverty thus continues to govern the focus of studies currently.

A widely-used indicator of poverty and valid in recent years is the “Index of Material Privation of Families” (IPMH), which was elaborated by the INDEC (Instituto Nacional de Estadística y Censos) and in its formulation gathers current and structural importance variables<sup>2</sup>. However, the characteristics of its formulation only permit it to be applied in 2001. This limitation of IPMH when analyzing indicator evolution was the main argument which led us to choose the “Index of Life Resources Privation” (IPMV) to carry out our study in the 1990s. The relation this indicator maintains with the IPMH is high, reaching a coefficient of Pearson correlation equal to 0.94.

The IPMV was elaborated and presented by MEICHTRY and FANTÍN (2004). It integrates two indicators: the Index of Subsistence Ability (ICS) and Lodging Condition (CH). The former tries to approach the current poverty dimension while the latter one examines the structural origin of it. Both indicators use the family as a unit of analysis and the “National Population, Families and Houses Survey” from 1991 and 2001 as a source of information, permitting the analysis of the temporal evolution of poverty. The ICS relates the income providers with the maximum educational level reached; meanwhile the CH expresses the result of the relation between the “type of house” and “stacking” variables. The value of the IPMV oscillates between 0 and 8 points, representing numerous possible situations (which could be considered as a weakness of the indicator in the intensity of the phenomenon measurement) (MEICHTRY and FANTÍN 2004).

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2 The IPMH is a variable which identifies families according to their situation with respect to material privation in relation to two dimensions: current and patrimonial resources. The patrimonial dimension is measured through the Lodging Condition indicator, which establishes that families who live in a house with a floor or roof made with insufficient materials or without basin with water drainage, present patrimonial privation. The dimension of current resources is measured through the Economic Capacity indicator which establishes that families with insufficient economic capacity to acquire the basic properties and services for subsistence present current resources privation. The combination of these dimensions defines four groups of families: without any kind of privation, with current resources privation only, with patrimonial privation only and with convergent privation (when both privations are presented simultaneously) (INDEC 2004). The IPMH intensity is derived by dividing the families with convergent privation by the total of families with some kind of privation (Figure 2).

The IPMV formulation is expressed as follows:

$$IPMV = \left( \frac{\sum_{i=1}^n P_i * NE_i}{n} \right) * CH$$

Where the *ICS (Index of Subsistence Ability)* is compounded by:

- $n$ : number of family members.
- $P_i$ : income provider with the following variables: 0: if he/she does not provide income; 1: if the one is a male provider; 0.75: in the case of a female provider; 0.50: for a retired person.
- $NE_i$ : Maximum educational level reached (1: did not attend or complete primary school; 2: completed primary school or EGB (Educación General Básica); 3: completed secondary school or; 4: completed tertiary or university education).

The *CH* indicator (*Condición Habitacional*), has the following values: 2.0 house-apartment type A without stacking; 1.5 house-apartment type A with stacking; 1.0 remaining types without stacking; 0.5 remaining types with stacking. It is considered that the value of *ICS* very well expresses the capacity of a standard family, made up of four members (father, mother and two children), to obtain the necessary resources for ensuring their existence and reproduction, so that this indicator is used to establish the poverty thresholds of the IPMV. The levels refer to the following situations:

- Family with a male provider who has not finished his/her primary education:  
 $1 * 1 / 4 = 0.25$
- Family with a male provider with a complete educational primary level or EGB:  
 $1 * 2 / 4 = 0.50$
- Family with a male provider with complete primary level or complete EGB and a female provider with incomplete primary education:  
 $(1*2) + (0.75*1) / 4 = 0.69$
- Family with a male and a female provider both with complete tertiary or university level education:  $(1*4) + (0.75*4) / 4 = 1.75$ .

These “thresholds” would indicate for the two first cases a very low and a low capacity to obtain the necessary income for the support of the family. At the other extreme, we consider that the fourth threshold would set the lower limit of the best conditions for the support of the family and reproduction. In this way, five levels in the IPMV formulation

are established, considering a poor family as one with low and very low levels (threshold line in IPMV = 0.49):

- Very High: 1.75 and more
- High: 0.70 to 1.74
- Medium: 0.50 to 0.69
- Low: 0.25 to 0.49
- Very Low: 0.00 to 0.24.

### **3 Poverty in the north of the “Gran Chaco Argentino”**

The population of the northern GCA grew during the 1990s at a higher rate than in the rest of the country. In 2001 the regional population again increased slightly more to three million inhabitants. Although important transformations occurred in the agriculture and cattle sector and in the economy in general, in 2001 the proportion of those in poverty increased by 5.7 percent, affecting more than half the population. Figure 3 shows the spatial distribution of poverty in 1991 and 2001, according to the IPMV. It can be observed that the poorest sectors of the El Chaco are in the north and the southeast extreme. The marked persistence of precarious living conditions in those departments in the 1990s should be noted. It can also be seen that most departments increased their IPMV level; there were very few cases where the index reduced. Comparisons of poverty distribution between the two dates permit us to classify – as the natural fracture of variations – the departments at four levels (Figure 4) (see Annex 1):

- Level 1: departments which decreased their poverty. This includes four jurisdictions, with variations from -3.2 to -0.2.
- Level 2: departments which experienced a minimal increase in impoverishment. This includes 25 jurisdictions, and the values oscillate from 0.3 as a minimum to 4.6 as a maximum.
- Level 3: departments which experienced a medium increase in impoverishment. This involves 30 jurisdictions, with values of variation from 4.9 as a minimum to 8.4 as a maximum.
- Level 4: departments which experienced a substantial increase in impoverishment. This contains 15 jurisdictions, and the variations range from 9.2 to 16.1.

Level 1 includes all those departments in which poverty decreased, while the remaining three, in an increasing order of intensity, include those in which poverty increased. Level 4 thus does not represent the poorest departments, but those that have undergone the greatest impoverishment, independent of the initial level on which they started. In the same way, level 1 does not represent better living conditions, but includes those departments in which, during the 1990s, the percentage of families with IPMV decreased. This classification permits us to analyze the evolution of poverty over the decade, independently of its grade of intensity, and to compare productive changes in the departments to their level of poverty variation.

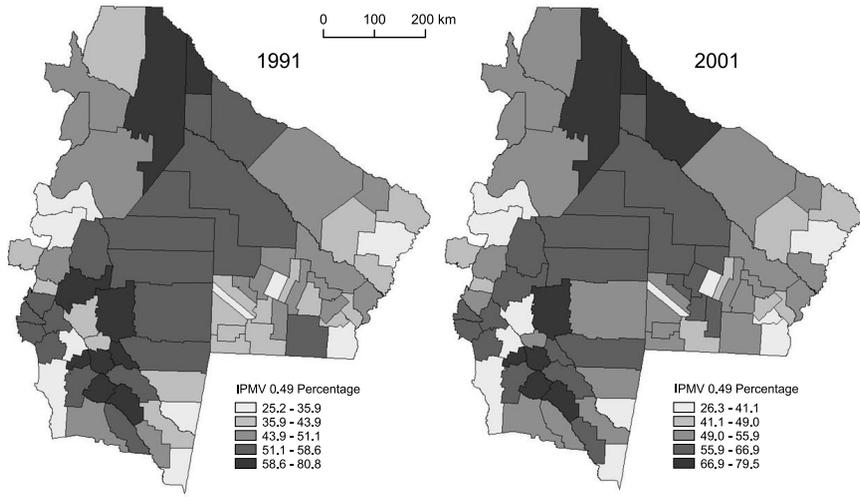


Figure 3: Classification of the Chaco departments, by the percentage of households with less than 0.49 IPMV, for 1991 and 2001

Source: Laboratory of Digital Cartography, ISES, CONICET - UNT based on data of National Population Census 1991 and 2001

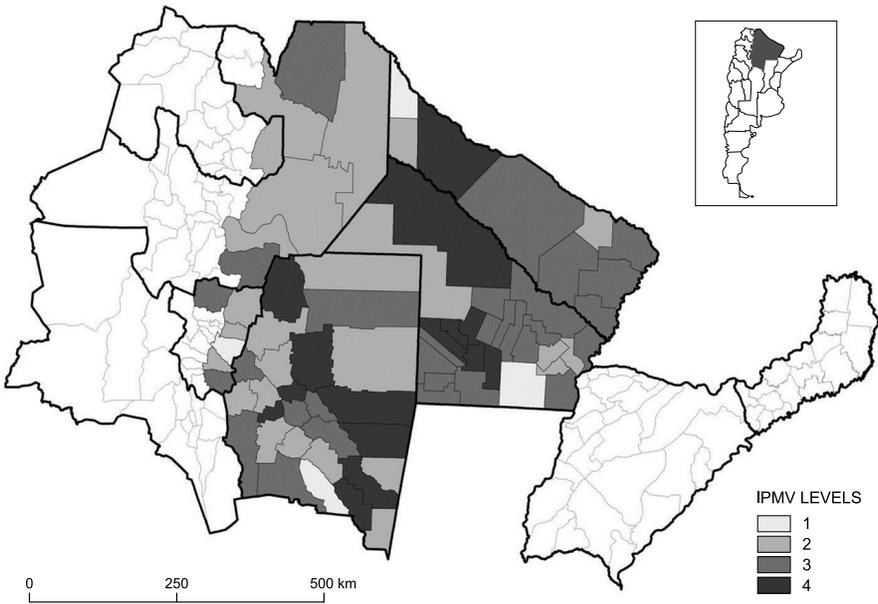


Figure 4: Variation levels of IPMV during the decade of 1990 for the study area

Source: Laboratory of Digital Cartography, ISES, CONICET - UNT based on data of National Population Census 1991 and 2001

Table 1: Total population, population percentage over the GCA total population, and percentage of poor homes, for each level of poverty variation. Values for 1991, 2001, and variation of poverty (according IPMV)

Levels of poverty variation	1991			2001			Variation of IPMV
	Population	% pop. Total	% IPMV	Population	% pop. Total	% IPMV	
Level 1	67041	2,7	60.3	77537	2,6	58.4	-1.9
Level 2	886180	35,2	49.4	1073895	35,7	52.2	2.8
Level 3	1298656	51,6	44.6	1539732	51,2	51.1	6.5
Level 4	264144	10,5	50.0	313610	10,4	61.1	11.1
TOTAL	2516021	100	48,3	3004774	100,0	54,0	5,7

Source: National Population Census 1991 and 2001

The generalized increase of poverty acquires dimensions that are even more significant if the initial values of poverty in 1991 and the population volumes which the phenomenon affects in each of the levels are analyzed, as can be observed in Table 1.

So we observe that level 1 – which would represent the best situation as there poverty decreased through the decade by around 2% – not only contains the lowest proportion of the total regional population, but also started at the highest value of poverty. On the other hand, in 2001 levels 2 and 3 represented jointly 869% of the total population. In level 3, in which poverty increased by 6.5% in the medium term, had in 1991 the lowest average value of poverty. Level 2 only increased by 2.8%, but its initial level of poverty was not so low.

Level 4 includes those departments in which poverty advanced in such a way that in 2001 nearly two-thirds of the 3,130,000 people who lived there were poor. There the IPMV increase was 11.1 % (nearly twice the regional average).

Analysis of the evolution of poverty in El Chaco during the 1990s, then, permits us to affirm that there was a generalized process of impoverishment. The few departments in which we find a decrease in the percentage of poor families are precisely in the most disadvantaged zones and such a decrease places 58.4% of the local population in poverty conditions. Somehow, what is observed in El Chaco is a homogenization in the IPMV values, in which the poorest departments reduce their poverty and the least poor increase it. In this way, even though causal relations cannot be established, we wonder if some bond or parallelism exists between agriculture and cattle transformations and the increase of poverty in the departments of the GCA. We thus now turn to analysis of the change process affecting the Argentinean agrarian structure and how it was carried out in the GCA.

#### **4 Agriculture and cattle production in Argentina and its transformations in the late 20<sup>th</sup> century**

Since the last third of the 20<sup>th</sup> century, Argentina has been characterized as an agrarian exporter country. Agricultural and cattle production for exportation has been centered in the moderate and plain area of the country: the La Pampa region. At the beginning of the 20<sup>th</sup> century the sown surface in that region reached its maximum using practically every area of land available and producing principally maize, wheat and sunflowers, plus cattle production (breeding of bovine cattle to obtain meat and milk) (REBORATTI 2010, p. 65). As time progressed, owing to subdivision through split inheritance and the sale of fields, the average size of agricultural and cattle enterprises decreased. Since the 1960s, some of the advances in relation to the “green revolution” began to be applied in Argentina: mechanized sowing and harvesting, crop rotation, electric wire fencing and mills for cattle. However, the use of crop fertilizers and forage supplements for cattle were not generalized at this time, cattle still mostly grazed in natural fields. The delay in introducing these improvements meant that the yields and volumes of production grew slowly and, consequently, markets for primary production were lost (REBORATTI 2010, pp. 64-65).

From the agriculture and cattle nucleus in the La Pampa region diverse centers of agriculture and cattle production were developed through the country, known as “regional economies” and related to agrarian industry: cotton in El Chaco; sugar in Tucumán, Salta and Jujuy; viticulture in Mendoza, yerba mate in Misiones and fruit culture in El Alto Valle del Río Negro. But, while the production in La Pampa was exported, the regional economies supplied the domestic market. This factor would be determining for the territorial development of the different productive areas and its underlying evolution.

Not before the middle of the 1970s, and more particularly in the 1980s, the “green revolution” was finally fully implemented in Argentina. New varieties of cereal were introduced which enabled the adoption of bi-annual harvests. The soy bean, in combination with other crops, started to become one of the dominant species of Argentinean agriculture. The use of Mexican short season wheat, in combination with the use of agrochemicals, facilitated the cultivation of soy beans in the summer and wheat in the winter (REBORATTI 2010, p. 65). The double wheat-soybean crop expanded first in the La Pampa region and rapidly displaced cattle raising (bovine and ovine) and sunflowers<sup>3</sup>. During the 1990s it expanded to part of the El Chaco region, owing to the increase in land prices and rents in the central region of Argentina. The advance of the soy bean occurred mainly through the deforestation of the “chaqueño” forest where the main activities were extensive cattle raising and the gathering of forest products, although some traditional crops were also cultivated (such as peas in southern Salta or cotton in El Chaco) (TEUBAL 2003, 2009; REBORATTI 2010).

3 Between 1988 and 2002 1.8 million head of bovine cattle and 3.1 million head of ovine cattle were produced in the Buenos Aires and Córdoba provinces, two of the main cattle provinces.

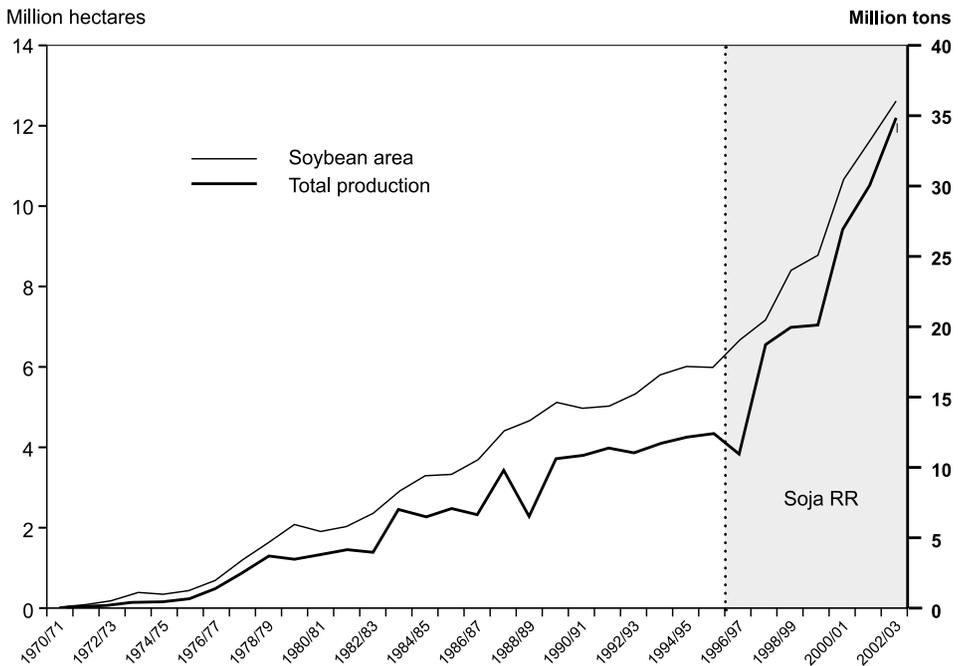


Figure 5: Evolution of the area planted and total production of soybeans in Argentina from 1970 to 2003

Source: Ministerio de Agricultura, ganadería y pesca de la Nación, Sistema integrado de información agropecuaria. URL:<http://www.siiia.gov.ar/>. Accessed: 7 Apr 2011)

During the last decades of the 20th century the production of the soy bean became one of the most dynamic activities of the Argentinean economy, with production aimed mainly at exportation (BISANG and SZTULWARK 2007, pp. 181-182). From 37 thousand sown hectares in the work period 1970/71, the area under soy bean cultivation grew to more than 12.6 million hectares in the work period 2002/03, increasing total production from 59 thousand tons to 34.8 million tons (Figure 5).

The advance of the soy bean was possible due to a series of factors:

- an increase in soy bean demand in the foreign market (especially in China);
- good relative prices for its production;
- the rapid and widespread diffusion of a new agronomic “package” (adoption of the direct crop, use of agrochemicals and, by the middle of the 1990s, the use of transgenic seeds<sup>4</sup>);

<sup>4</sup> The expansion of the transgenic soy bean occurred at a speed never seen before and permitted a series of competitive advantages to apply, facilitating the pre-eminence of Argentina in the worldwide market. The rapid development of the industrial sector and logistics and transport facilities were also relevant (BISANG and SZTULWARK 2007:182).

- the consolidation of a new organization of production, in which the primary activity, industry and services are closely interrelated;
- an increase in the size of the agricultural and cattle raising enterprises and the generalization of renting as a method of land occupation (REBORATTI 2010, p. 69; BISANG and SZTULWARK 2007, p. 190).

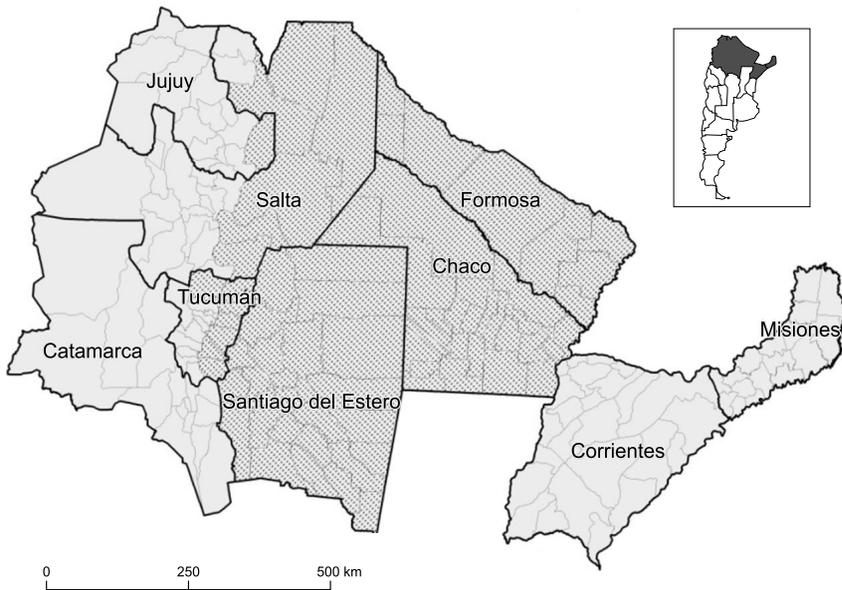
Added to these factors, in the GCA, was the occurrence of a cycle of increased humidity from the 1950s, intensified from the 1970s, which contributed first to the advance of the pea crop and then to that of the soy bean (PAOLASSO et al. 2010).

In the La Pampa region, the soy bean used the pre-existing territorial structure, favoring the growth of small and medium locations which became service-providing centers for soy bean production (REBORATTI 2010, p. 67). Although the agrarian activity that characterizes the “pampeano” territory continues, the changes were significant as the alternating pattern of cultivation/cattle raising that had been characteristic tended to disappear, making way for a landscape where agriculture put its seal throughout the year. Here the soy bean has generated prosperity – in the mid-term – for regional society, together with an undeniable process of capital concentration and the disappearance of small and medium producers. It is enough to compare any social and economic indicator with that of other regions of the country to see that La Pampa is among the most relatively well-off areas in the Argentinean context (VELÁZQUEZ 2008; BOLSI et al. 2009; BOLSI and PAOLASSO 2009a and 2009b). Evidently, this was not due to the adoption of the soy bean model, as the La Pampa region was traditionally the most prosperous region of Argentina, but at least the soy bean permitted that such conditions continued.

## **5 Agriculture and cattle frontier expansion in the north of the “Gran Chaco Argentino”**

The GCA is the major extension of forest and biomass reserve of the country and extra tropical south hemisphere (GASPARRI et al. 2008). Our study covers the northern sector of the GCA, corresponding to 74 departments of six Argentinean provinces: El Chaco, Formosa, Salta, Santiago del Estero, Tucumán and Jujuy (Figure 6).

AS MORELLO and SARAVIA TOLEDO state (1959a and 1959b), the original vegetation of the El Chaco consisted of areas of pirophitic pastures, areas of savannas and dense forests. This original vegetation, however, was altered with the inclusion of cattle which propitiated the transformation into areas of pasture with short forest and bushes. Today the dominating vegetation is forest, but there are also large sectors with bushes, especially in places with salt soils.



*Figure 6: Location of the Northern Argentine Big Chaco, under study*  
 Source: *Laboratory of Digital Cartography*

With more than 400,000 km<sup>2</sup> of surface area, the region of the GCA contained a population of more than three million people in 2001, representing a rather low population density, about 7.5 people per km<sup>2</sup>. 50% of the population live in the province capitals which are included in the study zone and the total urban population represents about 70% of the total population. During the 1990s the rural population of the El Chaco showed an important decrease although the percentage of dispersed countryside population remains considerable, at 11.5% of the total population and 42% of the total rural population.

In this context the territory witnessed during the 1990s large transformations in its productive structure. As mentioned above, in as much as soy bean expansion reached a certain limit in the La Pampa region and the price of fields began to increase significantly, the crop started to be propagated to the north, thus causing a process of major expansion of the agriculture and cattle frontier in recent decades (ADÁMOLI et al. 2008, p. 1; REBORATTI 2008, pp. 15-16).

The advance of the soy bean was made by means of the replacement of industrial crops (cotton, sugar cane), cereals (mainly peas) and extensive cattle raising (which extended throughout the GCA). However, the most important advance was carried out mainly by

resorting to the deforestation of the “chaqueño” native forest. It is calculated that during the 1990s an average of 175,000ha were deforested yearly in the GCA (GASPARRI 2010), a surface area which was added to the million of hectares calculated to have been deforested up to the late 1980s (REBORATTI 2008 and 2009), and thus making the GCA the most active deforestation region in the whole country (ADÁMOLI et al. 2008, p. 6). The soy bean expansion and the decline of the industrial crops (cotton and sugar cane) were the most important transformations in the “chaqueño” countryside, but there was also an increase in the surface sown with cereal and forage and an important increase in the number of head of cattle (Tables 2 and 3).

Between 1988 and 2002 the sown surface in the north of the GCA was increased by 79.9%, which meant that a little more than 1.5 million hectares of agricultural production was added to the 1.9 million of sown hectares recorded in 1988. 66% of this increase was soy beans, which expanded over 1 million hectares, tripling the area occupied at the beginning of the decade. At the end of the period the oleaginous crops (of which 85% is soy bean) occupied 45% of the regional sown surface. It is also interesting to observe that

Table 2: Area planted by crops in the north of GCA (hectares). Values for 1988 and 2002, relative and absolute change, and percentage of the increase over the total regional.

Crops	1988	2002	Increase	Rate of Increase	%
<b>Cereals</b>	332,576	739,465	406,889	122.3	26.7
<b>Oil crops</b>	502,811	1,539,193	1,036,382	206.1	68.1
<b>- Soybeans</b>	289,882	1,295,748	1,005,866	347	66.1
<b>Industrial crops</b>	532,916	347,108	-185,808	-34.9	-12.2
<b>Vegetables and legumes</b>	193,698	139,900	-53,798	-27.8	-3.5
<b>Fodder crops</b>	320,916	638,889	317,973	99.1	20.9
<b>Total</b>	1,903,967	3,404,555	1,521,638	79.9	100.0

Source: National Agricultural Census 1988 and 2002

Table 3: Livestock increased (cattle, sheep and goats) in the GCA, from 1998 to 2002

Livestock	1988	2002	Increase	Increase Rate	%
<b>Cattle</b>	3,363,305	4,770,554	1,407,249	41.8	57.5
<b>Sheep</b>	191,643	383,514	191,871	100.1	7.8
<b>Goats</b>	316,897	1,163,159	846,262	267.0	34.6
<b>TOTAL</b>	3,871,845	6,317,227	2,445,382	63.2	100.0

Source: National Agricultural Census 1988 and 2002

at the beginning of the 1990s more hectares were sown with industrial crops than with oleaginous ones. By the end of the decade the industrial crops had moved from occupying the first position to fourth place, behind oleaginous, cereal and forage, representing a decrease of 35%.

This formidable transformation was possible as the “pampeano” soy bean model was used, characterized by two yearly harvests (soy beans in summer and wheat in winter, varying sometimes with soy bean/saffron or maize/wheat). Furthermore, the model is based on the use of genetically-modified seeds, mechanization of the sowing and harvesting process and the generalized use of agrochemicals, particularly glyphosate.

At the same time, in the GCA there was an important increase of the surface area sown with forage and the number of head of bovine cattle. The soy bean expansion of the La Pampa region, which was realized to the detriment of cattle production, promoted the displacement of the agricultural and cattle activity to the north. The GCA became a marginal cattle area characterized by the low quality of its cattle groups, a cattle area becoming more relevant in the national context. In addition, the introduction of more refined species and a change in the management of the cattle groups helped to increase the carrying capacity of the enterprises. The same phenomenon also explains the increase of the surface sown with forage.

The progressive use of the model generated an increase in the field price<sup>5</sup> and the need of sophisticated machinery and adaptation to the new productive logic. This changed the producer profile, as it was necessary to have major capital and increased field lengths for profitable exploitation. These circumstances favored the influx of producers and foreign capital and a decrease in the demand for labor<sup>6</sup> (VAN DAM 2003, p. 140). This reduction in the number of jobs was accompanied by a change in the labor profile, as the use of machinery demanded relatively qualified workers to drive the machines. They are hired temporarily and generally come from outside the region.

The field consolidation process has been evident. Between 1988 and 2002 the number of agriculture and cattle enterprises (EAPs) decreased by 27.6%, but the surface area exploited increased by nearly two million hectares. The EAPs average size increased from 357ha to 456ha between 1988 and 2002, sharpening the inequality in field distribution. Figure 7 shows clearly that the EAPs of less than 25ha have decreased both in number and in surface area, while the ones between 500ha and 5000ha have decreased in number but increased the surface area they occupy significantly.

5 At the beginning of the 1990s one hectare of field in the east of Salta province cost 150 dollars; in 2002 it cost between 1300 and 1500 dollars (VAN DAM 2003, p. 174).

6 In the east of Salta it is thought that the demand for labor decreased from 2.5 wages/ha to 0.5 wages/ha (VAN DAM 2003, p. 175).

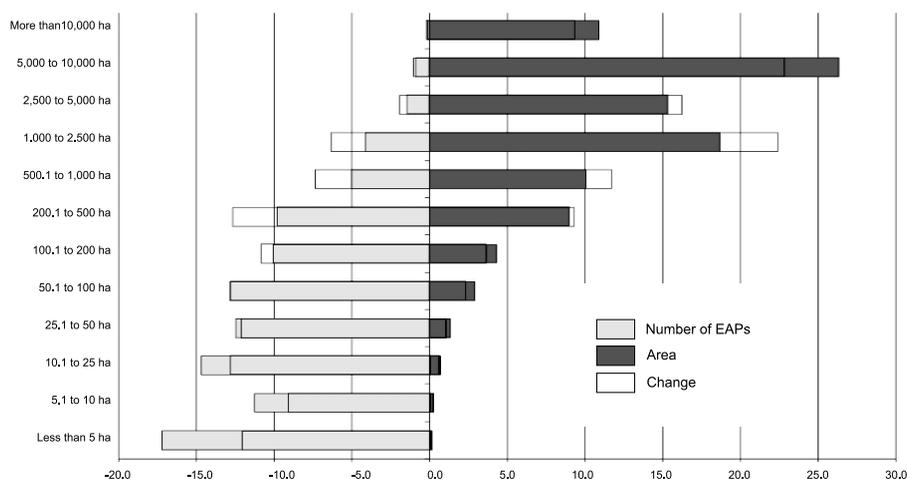


Figure 7: Number of farms and the area they occupied in the Argentine Big Chaco in 1988 and 2002

Source: National Agricultural Census 1988 and 2002

In the case of all these changes we can say that the entirety of production is commercialized out of the region, without any kind of process that brings added value to the area. The supplies and necessary seeds for production are provided by foreign companies; similarly the groups of workers that have taken over the labor are from outside the region. The profits obtained are not reinvested in the region, or if so, they are used to buy more fields or for the expansion of production, which does not have a dynamizing effect on the economy (VAN DAM 2003, p. 176).

In this way, the changes in land use, characterized by the replacement of crops and traditional cattle raising and the important increase of the surface area being exploited because of deforestation and the disappearance of a great number of small producers and the increase of medium and large enterprises, are the most evident and significant transformations that caused the agriculture and cattle frontier advance in the GCA during the 1990s.

## 6 Agriculture, cattle expansion and poverty

Now, having considered the process of productive change in Argentina and the GCA, and the extreme and persistent poverty conditions of the region, it is only left to analyze these two variables jointly. For that, firstly, we analyzed the relation between the levels of variation of poverty and the evolution of the large masses of crops during the 1990s (Table 4). While no tendency is clearly defined, it can be observed that the departments

Table 4: Percentage of cultivated area total increase, by group of crops and levels of poverty variation, in the north of GCA during the 1990's.

Crops	Level 1	Level 2	Level 3	Level 4
Cereals	29.6	31.0	14.0	29.4
Oil crops	67.8	58.1	88.5	71.8
- Soybeans	67.8	55.2	88.5	67.4
- Others	-	-2.9	-	4.4
Industrial crops	-16.7	-3.7	-31.7	-12.3
Fruit crops	0.0	-0.5	-0.3	-0.1
Vegetables and legumes	-5.5	-5.9	0.4	-2.1
Forest crops	-1.2	0.1	-0.2	-0.1
Fodder crops	26.1	21.0	29.3	13.4
Total	100	100	100	100

Source: National Agricultural Census 1988 and 2002

with the major increase in poverty (levels 3 and 4) in the 1990s also underwent important agrarian transformations related mainly to the increase of oleaginous crops. In relation to the area sown with other crops a clear pattern is not observed, as cereals increased in every level and industrial crops also decreased in general in every one. Table 4 shows that it is in level 3 that the major agrarian transformations occurred (with a major increase in oleaginous and forage crops and a larger decrease in industrial ones).

On the other hand, an important increase in cattle raising in the study area is observed (Table 5). The head of cattle increase in every level. However, it is in level 4 - major impoverishment - where we find the maximum increase (nearly 200%). However, if we observe the absolute number of head of cattle, we note that the increase is similar in every

Table 5: Absolute and relative livestock increased, by IPMV levels. (1988 - 2002)

	Level 1			Level 2			Level 3			Level 4		
Increase	112,587			991,514			948,035			1,095,423		
Increase Rate	48.9%			103.4%			36.8%			187.5%		
Increase by species	Bov.	Ov.	Cap.	Bov.	Ov.	Cap.	Bov.	Ov.	Cap.	Bov.	Ov.	Cap.
	32.2	19.5	56.2	45.8	6.7	36.6	53.4	2.6	17.7	37.5	7.2	23.0
Proportion Increase of CGA	3.6			31.5			30.1			34.8		

Source: National Agricultural Census 1988 and 2002

level where there is impoverishment, versus a 100,000 increase in head of cattle in the departments of level 1 only. The departments of levels 2, 3 and 4 each saw an increase of nearly one million head of cattle in the 1990s. In this way, although cattle raising was extended throughout the region, it grew most in the departments where impoverishment also increased the most.

As observed in Table 6, in the 1990s in the GCA generally there was an increase in the average size of the agriculture and cattle enterprises, from 357.3ha to 455.9ha. The change is owing to a decrease in the total number of agriculture and cattle enterprises (by about 7000 units) parallel to an increase in the total surface area they occupy (about 1.9 million hectares). The increase represents a 27.6% variation rate.

If we then compare this regional tendency with what happens in the departments disadvantaged according to the IPMV variation levels, we observe that tendencies are not homogeneous in all of them. While in every level there was an important increase in the average size of EAP (up to 19%), the major increase is in level 4, up to 55%. However, this increase is not owing to a contraction in the total number of EAPs (which increase from 8,800 to 9,400 between the beginning and the end of the decade) but above all owing to an increase in the total surface area they occupy, which is about 1.5 million hectares. That is to say, this increase represents 80% of the increase of the total surface area incorporated to production in the GCA, which means that in these 15 departments, which are the ones that have increased their poverty level the most, the agriculture and cattle frontier advance has been the strongest. Although the surface area of EAPs increased in every level, in no other level do we find so important an increase.

The average size at the beginning of the study period is, in this case, excellent. The areas where poverty decreased started the decade with the EAPs of the least average size (214ha) and finished, despite a high percentage increase, still with the smallest average

Table 6: Variation in the average size of farms by variation levels of IPMV in the north of GCA (1988-2002)

	EAPS 1988	SUP 1988	Tamaño Medio 1988	EAPS 2002	SUP 2002	Tamaño Medio 2002	Variación (%)
<b>Level 1</b>	3,174	680,092	214.3	2,281	702,275	307.9	43.7
<b>Level 2</b>	13,688	5,849,584	427.4	11,968	6,475,577	541.1	26.6
<b>Level 3</b>	24,703	9,189,163	372.0	20,015	8,908,027	445.1	19.6
<b>Level 4</b>	8,880	2,306,977	259.8	9,438	3,836,614	406.5	56.5
<b>Chaco</b>	50,445	18,025,816	357.3	43,702	19,922,493	455.9	27.6

Source: National Agricultural Census 1988 and 2002

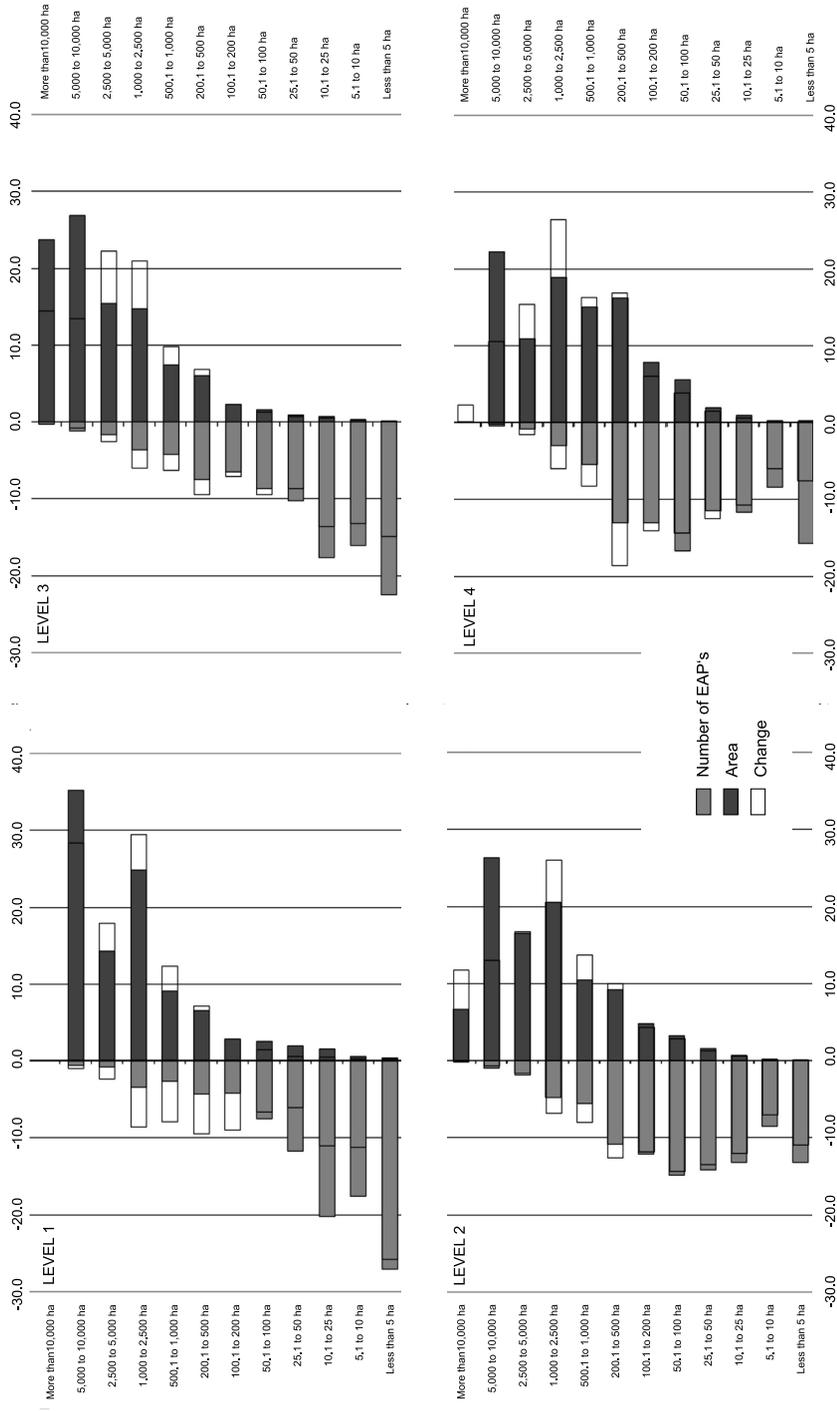


Figure 8: Agrarian structure by varying levels of poverty in the NGCA  
Source: National Agricultural Census 1988 and 2002

size (307ha). In contrast, the areas which impoverished went from an average size of more than 250ha and finished the decade with between 400ha and 540ha on average. However, in this case, the greatest average size of enterprises is found not in level 4 but in level 2, although, as mentioned above, level 4 presents the highest relative increase (56%).

Figure 8 compares the agrarian structure and the changes that occurred in it in 2002 with the levels of poverty variation. It can be observed that the major decrease of the smallest EAPs occurred in level 4. In contrast, the greatest growth of the number and surface area of the medium and large enterprises occurred in levels 1 and 2. This evidence is related to the variation in the average size of the exploitations analyzed above.

## **7 Conclusions**

The analysis of poverty variations in relation to the agriculture and cattle frontier advance in the north of the GCA, although no strictly causal connections between one phenomenon and the other can be established, shows an unpromising panorama for regional development. Although the GCA has historically been one of the poorest areas of the whole country, this tendency was not reversed after significant productive transformations in the 1990s. On the contrary, it has been observed that the living conditions of the local population have in most cases worsened.

The simultaneous increase of regional poverty with severe productive transformations shows us that this model is still far from becoming an engine for local development. The productive activities which are carried out in the territory were always a marginal part of the national economy. Since the 1990s, the agriculture and cattle frontier advance caused the region's produce to enter the domestic and foreign markets strongly and the region to become a major protagonist in the country. The increase of the soy bean crop has been the central driver in this process, together with the "pecuarización" (related to cattle) and tree-clearing.

The analysis of interaction between impoverishment and production changes in the GCA in the 1990s shows that together with an increase in sown area, especially of soy beans, and the increase of cattle raising, there was a generalized increase in the poverty conditions of the population. Precisely in the departments where poverty most increased in the 1990s, most changes appeared in relation to the expansion of the sown area, increase in number and average size of the agriculture and cattle enterprises (EAPs) and increase in oleaginous crops and head of cattle. These results permit us to affirm that the economic activities which were developed in these departments were not effective enough to reduce poverty. On the contrary, apparently the scanty redistribution of the profits obtained by means of these new economic activities led to an increase in poverty levels. The reasons

for this non re-distributive behavior would seem to be related to the presence of foreign businessmen and the weak reinvestment of profits in the region.

Why then do these economic activities, which should bring prosperity for the local population, not succeed in doing so and why, on the contrary, are they related to poverty increase? The answer to this question is the absence of state policies and a development model adapted to the territory under consideration here. It is not the target of this work to analyze Argentina's and El Chaco's social and economic system failures, but it is evident that effective state intervention and adequate planning are needed to lead genuine regional development. The productive transformation is not enough to reverse El Chaco's historical poverty. Specific policies which guarantee the redistribution and local reinvestment of profits are needed in order that the great economic benefits generated from the productive activities are seen locally.

## 8 References

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## ANNEX 1

Province	Department	IPMV 1991	IPMV 2001	Variation	Level
Santiago del Estero	Quebrachos	54.4	51.2	-3.2	1
Chaco	Tapenagá	53.5	50.5	-3.0	1
Formosa	Ramón Lista	80.8	79.5	-1.3	1
Tucumán	Leales	52.5	52.3	-0.2	1
Santiago del Estero	Jiménez	64.9	65.2	0.3	2
Santiago del Estero	Rivadavia	25.6	26.3	0.7	2
Salta	Anta	49.8	50.5	0.7	2

Santiago del Estero	Moreno	55.0	55.9	0.9	2
Santiago del Estero	Belgrano	35.9	36.9	1.0	2
Tucumán	Cruz Alta	43.9	45.1	1.2	2
Santiago del Estero	Salavina	70.6	71.9	1.3	2
Tucumán	Burruyacú	50.3	52.8	2.5	2
Chaco	General Donovan	46.0	48.5	2.5	2
Formosa	Matacos	57.3	60.0	2.7	2
Tucumán	Simoca	57.1	60.1	3.0	2
Santiago del Estero	Loreto	56.7	59.8	3.1	2
Chaco	Libertad	37.1	40.2	3.1	2
Santiago del Estero	Capital	25.2	28.4	3.2	2
Santiago del Estero	Guasayán	55.4	58.7	3.3	2
Chaco	Almirante Brown	53.3	56.7	3.4	2
Formosa	Pilagás	50.4	53.9	3.5	2
Salta	Metán	35.1	38.8	3.7	2
Santiago del Estero	Atamisqui	72.9	76.7	3.8	2
Salta	Orán	46.5	50.4	3.9	2
Chaco	1 de Mayo	41.3	45.5	4.2	2
Salta	Rivadavia	65.8	70.0	4.2	2
Santiago del Estero	Banda	36.7	41.1	4.4	2
Santiago del Estero	Copo	54.4	58.8	4.4	2
Formosa	Santa Bárbara	47.2	51.8	4.6	2
Chaco	Sargento Cabral	49.5	54.4	4.9	3
Santiago del Estero	Sarmiento	62.0	66.9	4.9	3
Tucumán	Trancas	40.0	45.2	5.2	3
Formosa	Patiño	47.8	53.1	5.3	3
Formosa	Pirané	42.8	48.2	5.4	3
Chaco	25 de Mayo	47.8	53.2	5.4	3
Chaco	Chacabuco	35.4	41.1	5.7	3
Chaco	Quitilipi	43.3	49.0	5.7	3
Santiago del Estero	Río Hondo	52.9	58.6	5.7	3
Santiago del Estero	Ojo de Agua	45.1	51.3	6.2	3
Chaco	San Fernando	26.7	32.9	6.2	3
Salta	San Martín	43.4	49.8	6.4	3
Chaco	Fontana	38.8	45.3	6.5	3
Santiago del Estero	Alberdi	54.2	60.8	6.6	3
Santiago del Estero	Choya	31.6	38.3	6.7	3
Chaco	San Martín	47.6	54.3	6.7	3
Santiago del Estero	Avellaneda	58.6	65.3	6.7	3
Tucumán	Graneros	55.3	62.0	6.7	3
Formosa	Formosa	29.9	36.7	6.8	3

Salta	Rosario de la Frontera	33.8	40.9	7.1	3
Chaco	12 de Octubre	43.4	50.6	7.2	3
Chaco	Fray J. Sta M. de Oro	43.4	50.6	7.2	3
Chaco	2 de Abril	43.4	50.6	7.2	3
Chaco	Bermejo	45.3	52.5	7.2	3
Formosa	Pilcomayo	39.3	46.7	7.4	3
Chaco	Maipú	49.3	56.8	7.5	3
Chaco	Presidente de la Plaza	43.4	51.3	7.9	3
Santiago del Estero	San Martín	66.1	74.0	7.9	3
Chaco	Cmte. Fernández	32.2	40.4	8.2	3
Formosa	Laishi	43.7	52.1	8.4	3
Santiago del Estero	Pellegrini	57.1	66.3	9.2	4
Santiago del Estero	Gral. Taboada	42.6	52.0	9.4	4
Chaco	9 de Julio	41.4	50.9	9.5	4
Formosa	Bermejo	58.2	67.8	9.6	4
Santiago del Estero	Robles	40.8	50.4	9.6	4
Santiago del Estero	Silípica	62.7	73.2	10.5	4
Chaco	Güemes	53.3	63.9	10.6	4
Santiago del Estero	Aguirre	40.1	50.9	10.8	4
Santiago del Estero	Mitre	46.6	57.5	10.9	4
Santiago del Estero	Ibarra	53.6	64.6	11.0	4
Chaco	San Lorenzo	48.5	59.6	11.1	4
Chaco	Belgrano	49.1	60.2	11.1	4
Chaco	Independencia	51.1	63.9	12.8	4
Chaco	O' Higgins	42.6	57.4	14.8	4
Santiago del Estero	Figueroa	61.9	78.0	16.1	4

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## **Peasant Vulnerability, Glacier Mass Decline and Water Availability: Case Study Concerning the Effects of Changing Runoff Regimes in the Cordillera Blanca, Peru**

Martina Neuburger (Hamburg),  
Georg Kaser, David Bregulla, Wolfgang Gurgiser (Innsbruck)

### **Abstract**

Climate change as a topic in science and society has experienced a considerable increase in general attention over the last couple of years. Increasingly, well-informed technical knowledge on the one hand is meeting a broadening public interest on the other hand. However, at the same time worldwide reactions to climate change indicate a big difference in how the various social groups and actors cope with, interpret and exploit this alleged global topic in their respective socio-economic realities. No longer is the world's changing climate an exclusive topic of Western discourse surrounding green environment policy and sustainable livelihoods. These dynamics are becoming even more evident at places that are being viewed by the world as symbols of a warming climate. Tropical glaciers are especially suited for identifying changing dynamics as a consequence of climate change. On the one hand, they are situated in highly sensitive ecosystems and on the other hand, they are all located in countries of the global south. Therefore it is in areas with tropical glaciers where direct influences of globalisation and climate change come together. The goal of the present case study is to, on the basis of high-detailed glacier runoff measurements, trace these influences on a local and regional level and to analyse their implications for the national and global level at the same time. The site of our case study-proposal is the Cordillera Blanca in Peru. This Andean mountain range represents one of the biggest and most important glaciated areas in the Tropics. Due to this, the region draws attention from such different actors as the global scientific community; local, regional and national governments; the tourism-industry; industries linked to the resource of water and – above all – the local population. Catastrophic, so called natural disasters in the form of deadly floods or international hydro-electric companies cutting off the water supply of whole communities – the past has already shown what kind of dynamics glacier runoff can trigger in this region. It is in the realm of the local population, rural and urban, that this case study intends to shed light on the vulnerability to water scarcity on a household level. How do dwindling water supplies (caused by declining glacier runoff) effect people's day-to-day lives in the area, how do they cope with it and how does this influence the ongoing societal struggles in the region and in Peru?

## **1 Introduction**

Climate change and glacier mass, on the one hand, and impacts on agriculture and peasant vulnerability, on the other, are interrelated issues that are discussed in a broad political, societal and scientific context. However, studies about the direct interdependencies between these phenomena are scarce. The goal of the present case study – localized in the Cordillera Blanca region (Peru) – is to, on the basis of high-detailed glacier runoff measurements, trace these interrelations on a local and regional level and to analyze their implications for the national and global level at the same time. The Cordillera Blanca region was chosen because of water scarcity in the dry season exclusively depending on glacier runoff. Thus climate change and glacier mass decline have a wide impact on vulnerability of the dominant peasant population, while increasing international tourism reduces the importance of agricultural activities for livelihoods of rural families.

As first step we will mention some key data about the general context of the Andes and the basic framework of glaciers, water and peasants. Afterwards we describe in more details the importance of glaciers for human settlement and water management systems in the Callejón de Huaylas. Finally we focus on the Quebrada Shallap to present preliminary findings gained by exploratory studies in July 2010. These results outline future research questions and conceptual frameworks.

## **2 The Andean context**

### **2.1 Glaciers and water in the Andes**

Although reliable figures are often missing, considerable detrimental changes due to shrinking glaciers and snow cover are universally expected for water availability in river systems that originate from glaciated mountain regions (KASER et al. 2010). Glaciers produce melt-water only during warm periods, while water storage in glaciers and seasonal snow cover occurs only during wet periods. If wet and warm periods in a region coincide, the production of melt-water and the increase of water storage occur at the same time, reducing the effect of seasonally delayed water release from the glaciers. The relative impact of glacier melt during wet and warm periods is further decreased through the general increase in water availability from precipitation. Therefore, melt water runoff matters most when it is both warm and dry and especially if a river flows into an arid area. Some regions of the world like the tropical Andes between Venezuela and Bolivia exhibit a combination of warm and dry conditions as part of their seasonal cycle. Thereby, glacier contribution to seasonal varying water availability is particularly high in this region (KASER et al. 2010; MARK et al. 2010).

More than 99% of the worldwide tropical glacier areas are distributed over the South American Andes, more than 70% alone are located in the Cordilleras of Peru. Numerous archaeological discoveries from the pre-Columbian and also from the pre-Inca periods show that even high regions in the Cordilleras have been settled for a long time, and that the nearby glaciers have probably been a threat to the native people since that time by avalanches and other catastrophes caused by glaciers and glacier lakes (KINZL 1935; GOLTE and CADENA 1986; CAREY 2010). The first Spaniards that came to the tropical Andean region, however, also reported on the Inca irrigation systems based on glacier water. Due to the fact that glacier retreat accelerated since the “Little Ice Age” water runoff has risen because of increased melting rates. However, when glacier mass reduces as significantly as it is expected by glaciologists water availability may shorten (VUILLE et al. 2008).

## **2.2 Water and peasant communities in the Andes**

Throughout its vivid history and up until today’s situation, the meaning of water and irrigation for the region of the South American Andes cannot be underestimated. Water in general has become a very sensible issue. In the Andes, the communal territories formally accepted form a large part of the national territories, representing a diverse range of management systems in relation to natural resources (ORE 2009, p. 420). In many cases, the roots of these management systems stem from pre-colonial times and from concepts established during that time. It is only recently that there are more studies concerning the communal resource management, apart from those on irrigation practices (ORE 2009, p. 420). In the case of the Cordillera Blanca, this has been well documented, e.g. by KINZL (1963).

In Peru, and likewise in other Andean countries, the structural conditions in relation to water have a severe impact on the livelihoods and vulnerabilities of the population. In our preliminary studies in the Cordillera Blanca in specific and in Peru in general, we could affirm what can be found in the relevant literature, amongst others, ORE (2009); BOELEN and HOOGENDAM (2007); VERZIJL (2007); BOELEN, GETCHES and GUEVARA-GIL (2006) or URTEAGA and BOELEN (2006) and what can be grouped in three major areas. Firstly, there exists a lack of systematic and reliable information on water. Secondly, the fact that, on average, the governments in the Andean region do not manage to supply drinking water and sewage disposal to more than 50% of their respective territories (ORE 2009, p. 413). And thirdly, that one of the predominant beliefs of policy makers in the region still circles around the belief that due to higher demands for irrigation and increasing water usage of the different societal sectors, the answer should be the construction of new and costly water management systems (ORE 2009, p. 414). It also became clear that, especially in Peru, the rapidly growing export oriented agro-businesses that cluster around the coastal oasis along the Peruvian stretch of the Pacific Ocean lead to constantly

growing water demands of the agricultural sector. Closer to the water sources of the Río Santa, the glaciers of the Cordillera Blanca, pressures on water demand also arise from the growing tourism industry in the area. Finally, we could observe an increase in export-orientation in agricultural production in the Callejón de Huaylas.

State-policy towards water is not yet strongly positioned in Peru and the grades of participation are not high. Despite the fact that since 2008, a Ministry of the Environment (MINAM) and a national water ruling body (ANA) were founded, the raised hopes of these institutional signs can (yet) not be fulfilled. Or, as ORE (2009, p. 417) put it, “the increasing environmental conflicts surrounding water as a resource reflect in a certain way the institutional fragmentation and problems of governability” of water in Peru. If we also take into account the fact that by now “more than half of all rivers are severely contaminated” (ORE 2009, p. 415), it becomes clear that apart from institutional fragmentation, Peru also faces a fragmentation in the access to safe water conditions. It is on top of all this that one of the most important legal frameworks concerning water in Peru (La Ley de Riegos) leads itself to new conflicts between rural peasants and the growing number of national and international companies seeking profits out of their excessive use of water resources due to the law’s regulations concerning rights and registers – “the majority of environmental conflicts [...] have been because of local interventions of companies” (ORE 2009, p.420).

In Peru, the articulation of common point of views by social organizations of peasant and/or indigenous groups has not yet let to a strong positioning of their voices in the Peruvian institutional landscape. At the same time, governmental incentives seem to be more pre-occupied with openly supporting industries, especially in the agricultural and extractive sector (ORE 2009, p. 422).

### **3 Glaciers and their importance for human settlement in the Cordillera Blanca**

In the tropical Andes in general and in the Cordillera Blanca more specifically a single-peak annual moisture cycle (Figure 1) and homogeneous thermal conditions with a consequent lack of seasonal snow cover outside the glacier areas leaves the glaciers as the dominating water source during the several months-long and pronounced dry season (JUEN et al. 2007; KASER and OSMASTON 2002; KASER et al. 2003; JUEN 2006; MARK et al. 2010). A most outstanding example is the Callejón de Huaylas (upper Río Santa basin) in Peru, where the Río Santa and its tributaries drain the western flanks of the highly glaciated Cordillera Blanca through the prosperous region towards the extremely dry coastal desert and, finally, into the Pacific Ocean (e.g. KASER et al. 2003; MARK and SELTZER 2003; POUYAUD et al. 2005; JUEN et al. 2007; CONDOM et al. 2011).

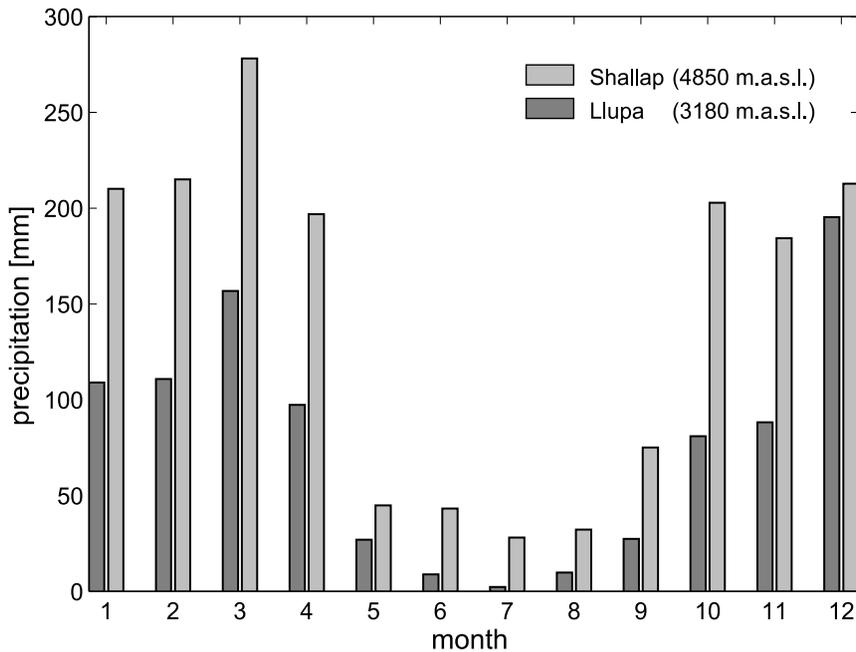


Figure 1: Mean monthly precipitation sums in Llupa and at the Glaciér Shallap moraine station (Figure 3)

Source: Own compilation

Glaciers in the Cordillera Blanca cover approximately 570 km<sup>2</sup> (data of 2003, RACOVITEANU et al. 2008), making up about one quarter of all tropical glaciers (KASER 1999; KASER and OSMASTON 2002) (Figure 2). They have lost considerable amounts of mass since a maximum extent in the 19th century (GEORGES 2004; RACOVITEANU et al. 2008; KASER et al. 1990) and they are still in the state of recession (MARK and SELTZER 2005; RACOVITEANU et al. 2008) with a speedup in the last years (BURY et al. 2011). With this, they adapt to changing climate conditions (e.g. KASER and GEORGES 1997; HASTENRATH and AMES 1995) and modify the naturally seasonal water availability in the region (MARK and SELTZER 2005; MARK et al. 2010). Climate variability associated with El Niño Southern Oscillation (ENSO), modulated on longer timescales through the Pacific Decadal Oscillation, has been identified as a potential source of mass balance variability in the Cordillera Blanca (VUILLE et al. 2008). As the Río Santa Valley in Peru is located in the outer tropics, due to the oscillation of the Inner Tropical Convergence Zone (e.g. KASER and OSMASTON 2002) the seasonal precipitation is highly variable with a distinct dry season (<10% of annual precipitation sum) from May to September (Figure 1) (KASER and GEORGES 1997; KASER et al. 2003; JUEN et al. 2007). During that period glacier melt water production contributes for up to 100% of stream flow in local rivers (BURY et al. 2011) and even for 66% in the Río Santa at Huallanca (MARK et al. 2005).

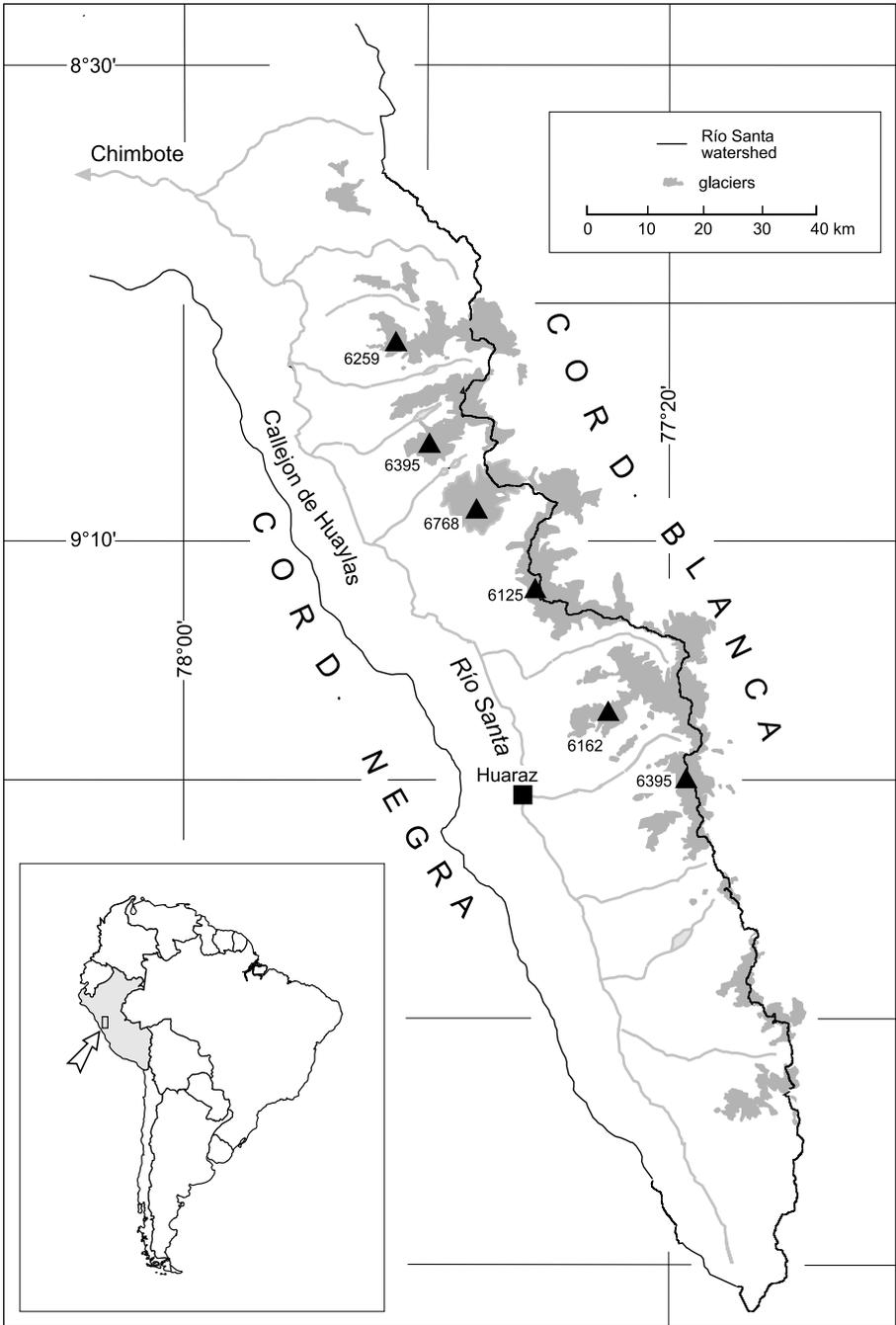


Figure 2: Overview over the glacierized area of the Cordillera Blanca  
Source: KASER and OSMASTON 2002, p. 117, modified

Due to the progressive retreat of the glaciers in the Cordillera Blanca, the risk of natural hazards in the Río Santa valley increased within the last decades. Large basins created by the former glacier tongues hold great water volumes retained by moraines. The stability of these frontal moraines arises from a dead ice core. However, with further melting the dead ice clears away and the surface areas of the lakes expand. Thus, the pressure on the moraines increases while their stability decreases. The major risk of this situation is that the frontal moraine may not withstand the pressure, and may, finally, burst. Another risk consists of parts of the melting glaciers dropping into the lake and provoking an overflow. At the same time, permafrost areas in the proximity of the glaciers lose their stability by melting processes and may form great avalanches. The risk of these catastrophic events increased through a growing number of glacier lakes: Between the 1960s and 1990s the number of lakes in the Cordillera Blanca rose from about 99 to more than 138 by glacier retreat (KASER 1996, p. 21). Frequently occurring earthquakes mostly act as triggers for such hazards. Thus, in the Callejón de Huaylas 29 glacier-related disasters are recorded since 1725, with 18 within the last 60 years. These events destroyed not only agricultural land and crop harvests but human settlements as well. The most hazardous avalanche occurred in 1970, when 15.000 people of the city of Yungay lost their lives (CAREY 2010).

#### **4 Water and people in the Cordillera Blanca**

The Callejón de Huaylas represents one of the few valleys in the Peruvian highland that has been settled since the so-called Chavín-period (GOLTE 1983). Only the innovation of irrigation by a small mashed network of channels permitted a relatively high density of population, but with great differences between the Cordillera Blanca slope of the Callejón de Huaylas and the Cordillera Negra slope. Due to the fact that glaciers are absent on the Cordillera Negra the rivers are not perennial and only seasonally water bearing. Thereby, in pre-historical times as well as today, agriculture on the Cordillera Negra slopes is restricted to the wet season and depends exclusively on precipitation.

On the Cordillera Blanca slope, the *quebradas* of Callejón de Huaylas are largely characterized by subsistence farming, while agriculture in the main valley of the Río Santa is predominantly market-oriented in order to supply the cities and towns of the region (GOLTE and CADENA 1986; BURY et al. 2011). During the dry season, water from the Río Santa's glacier fed tributary streams is used to irrigate the small-scale fields. While extensive animal husbandry dominates the smaller side valleys above 4000m, the lower parts are recently transforming from traditional farming dominance towards a growing importance of non-agricultural income such as mountain tourism and urban jobs (YOUNG and LIPTON 2006; MARK et al. 2010; BURY et al. 2011). Nevertheless, agriculture remains a crucial element of rural life and culture and depends essentially on glacier fed water availability for irrigation during the dry and intermediate season. Over the last 15 years, water consumption increased severely because of modernisation of agricultural

techniques and increasing production of vegetables, fruits, and flowers for national and international markets (MARSHALL 2009).

For millennia, water use in the Callejón de Huaylas has been managed through sophisticated distribution systems (GOLTE 1983; KINZL 1963). In pre-colonial times, rights and duties on natural resources, such as land and water, were directly linked to myths and ancestor worship defining the leadership of elected families. Until today, emplacements of large necropolis in the *quebradas* witness the spatial limits of ancient claims over irrigation water (HERRERA 2007). Terraced fields as well as an elaborate network of irrigation channels with aqueducts and tunnels facilitated the extension of arable land, reaching heights well beyond today's limits of agricultural activity (KINZL 1943, 1944 and 1950; GOLTE 2005; HERRERA 2007; LANE 2006). Up until today, the (pre-)colonial structures of organisation in the arable areas of the Río Santa valley are the basis for the internal regulations in the *comités de aguas*. Hereby, the leader-families, which derive their legitimization from history and mythology, have taken over the running of the *comités de aguas* on a local level (GOLTE 2005). These families represent the lowest level organisation units of the governmental water administration. One level up, they are integrated into bigger entities, which, as such, cover approximately the area of one tributary stream of the Río Santa. All of these entities are, in turn, subject to the regional dependence of the governmental institution ANA (Autoridad Nacional de Agua) (internal documents of ANA, 2010). As a consequence of the millennia-long water usage, the runoff regimes alongside the *quebradas* experienced various, anthropogeneous reshaping by means of deviation and drainage (KINZL 1943).

Despite the fact that hydro-engineering activity has helped improve water availability throughout the seasons in the Río Santa valley in general, water management is increasingly reaching its limits during the last years. This is mainly due to the continuously rising water demand triggered by the extension of irrigated agriculture and by growing cities (MARK et al. 2010; BURY et al. 2011). Already today, the modification of runoff, which can be expected in the Callejón de Huaylas in the course of melting glaciers, is leading to competing water uses that are being intensified by powerful discourses on global climate change and its consequences as well as by the appearance and actions of development agencies and environmental NGOs. These globally induced discourses drew increasing attention to local water management systems and legitimated measures of hydro engineering and of restructuring of water institutions (BOELENS et al. 2010; CAREY 2010; MARK et al. 2010; YOUNG and LIPTON 2006 and expert interviews of July 2010). Simultaneously, the lack of scientific knowledge and of communication between scientists and engineers, on the one hand, and population and decision makers on the other hand, was a considerable reason for past failures in communication, management and action (CAREY 2010).

These processes have favoured water access of some user groups while others suffered sensible losses of water availability. Thus, in an environment of constantly increasing water demands on the one side, and changing water availability as a consequence of ongoing climate change on the other side (e.g. JUEEN et al. 2007; VUILLE 2011 (in press); MARK et al. 2010), some societal groups are more vulnerable to further potential changes and have a more limited adaptation potential than others. The sum of the above mentioned processes have given reason to increasing tensions in the past (CAREY 2010; KASER et al. 2003; MARK et al. 2010; BURY et al. 2011) and are expected to lead to conflicts in the future (e.g. KASER et al. 2005; KASER et al. 2004; MARK 2008).

## 5 The context of the Quebrada Shallap

### 5.1 Socioeconomic and glacio-hydrological characteristics

Within this regional context the Quebrada Shallap east of Huaráz, the capital city of the Callejón de Huaylas, with presently >140 000 inhabitants (INEI 2007), is particularly interesting due to the large vertical and horizontal extension (Figure 3). The area ranges from 6340 (Nevado San Juan) to approximately 3070 m a.s.l.

A lower, populated area extends from urban Huaráz into the extensive cattle breeding places in the higher *quebradas* (valleys) of Shallap and Quilquayhuanca. This area not

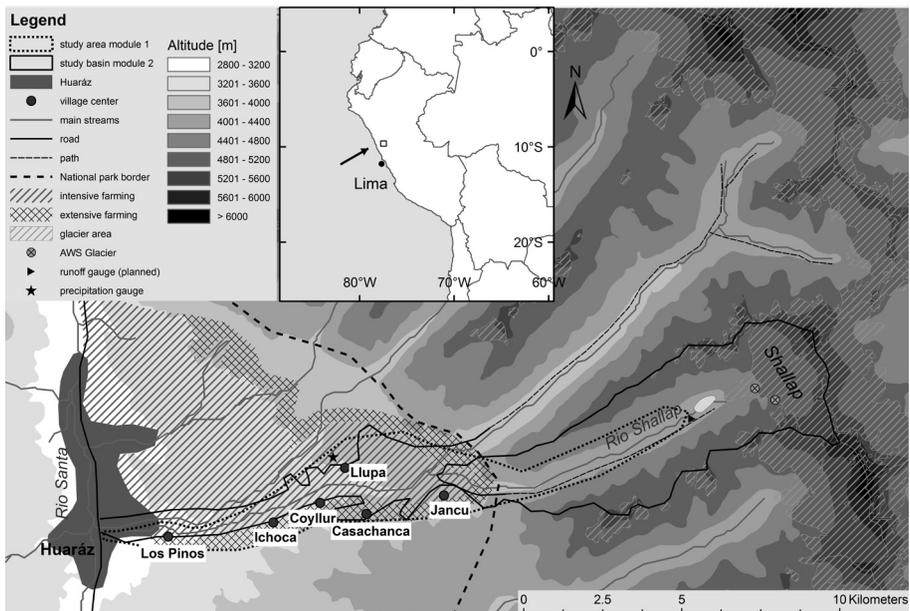


Figure 3: The Quebrada Shallap in the Cordillera Blanca, Peru

Source: Design by the authors

Table 1: The *comités de regantes* in the study region

Irrigation Committee	Irrigation Bloques		Agricultural Area				Parcels		Users	
			Total		Under Irrigation					
	N°	Name	ha	%	ha	%	N°	%	N°	%
<b>Paquishca-Querupampa</b>	5	Paquishca	45,5	1	43,2	1	362	6	258	8
<b>Auqui-Tacllan</b>	6	Auqui-Tacllan	124,5	3	120,0	3	445	7	340	10
<b>Ahaalap-Huapish-Toclla</b>	7	Ahaalap-Huapish-Toclla	2.613,9	63	2.519,6	63	2.657	42	1.355	40
			2.783,9	67	2.682,8	67	3.464	55	1.953	58

Source: Material of the ANA 2010

only provides a strong vertical profile of changing physical parameters and environmental conditions but also a high variety of rural households, their vulnerabilities and mutual interactions. The three *comités de regantes* Paquishca-Querupampa, Auqui Tacllan and Ahaalap-Huapish-Toclla organise the water resources for irrigation in the study area (Figure 4). They have approximately 2000 members and control about 2700 ha of irrigated land (ANA 2010).

The drainage basin of the Río Shallap covers approximately an area of 35 km<sup>2</sup> of which 8.3 km<sup>2</sup> (23%) are presently glaciated. Glacier Shallap is among the few safely accessible glaciers in the Cordillera Blanca but still of a representative size and altitude range. We operate an automatic weather station, AWS, on the south moraine of the glacier (Figure 4) at around 4950 m a.s.l. since 2004, recording temperature, humidity, wind speed and direction, global irradiance and precipitation at hourly time steps. Weekly precipitation sums are measured at Llupa (Figure 2). Since 2010, an AWS is also operated on the glacier (no precipitation, but surface elevations changes). The Río Shallap provides a considerable portion of the water used by the different communities who form part of the human-geographical side of our study. Understanding and modelling water variability in the glacier dominated dry and intermediate seasons will be crucial for defining the range of future impacts on different types of households.

## 5.2 Preliminary outcomes on peasant vulnerability and water availability

First exploratory studies in July 2010 and bibliographic research allowed insights to socioeconomic and hydro-glaciological as well as to human-environmental interaction processes in the Cordillera Blanca. Within the socioeconomic perspective we identified a strong relationship between household vulnerability, community power relations, and

global discourses. In recent years, agriculture continuously lost significance in the peoples' survival strategies by an accelerated process of modernisation in this sector and a subsequent growth in the non-agricultural employment sector, especially in tourism, as well as by the rising number of multi-local households and increasing remittances (MARK et al. 2010; YOUNG and LIPTON 2006 and information from expert interviews). Since the traditional forms of living and working have adapted quite flexibly to these new boundary conditions, the vulnerabilities of each household and the respective scope of action have become more dynamic.

The vulnerability of a single household strongly depends on its particular social, economic and political involvement in the respective community. Small-scale power relations inside the communities and the *comités de aguas* are reflected in the formal and informal institutions and patterns of (legal and illegal) irrigation water distribution (as for example in Chile see BUDDS 2010). These rules are decisive when considering which household gets which quantity of water, where new irrigation canals should be built or where old ones should be continuously maintained or modernised. Another decisive factor of vulnerability is the households' participation in political decision-making processes, especially in water management.

The relationship between global climate-change, shrinking glaciers, and water scarcity can be interpreted as a powerful discourse which is producing and reproducing power relations on the regional, national and international level. As observed during the field trip in July 2010, the climate change discourse is rather omnipresent in the study area due to the long-run attendance of international research teams analysing glacier recession, water availability and peasant vulnerability. Discourse and scientifically produced knowledge about the related phenomena legitimize political decisions on the national and regional level regarding water-management and, at the same time, allow, prevent or criminalise specific irrigation practices and – more generally – certain land use systems at the local level (DEMERRIT 2006; CAREY 2005 and 2010). Thus, dynamics of climate change discourse directly influences household vulnerability.

On the environmental perspective, detailed studies of glaciology and hydrology provide information about the influence of glacier mass balance on runoff in the Quebrada Shal-lap. It is still known that in this region the year-round ablation indicates more constant glacier hydraulics than in mid and high latitudes and that very steep slopes as well as barely existing soil and vegetation cover strongly reduce the potential storage volume and ground water flux from non-glaciated parts. Therefore analyses of glacier melt water production on high spatio-temporal resolutions offer crucial information on different time scales and magnitudes of water availability especially during the dry season.

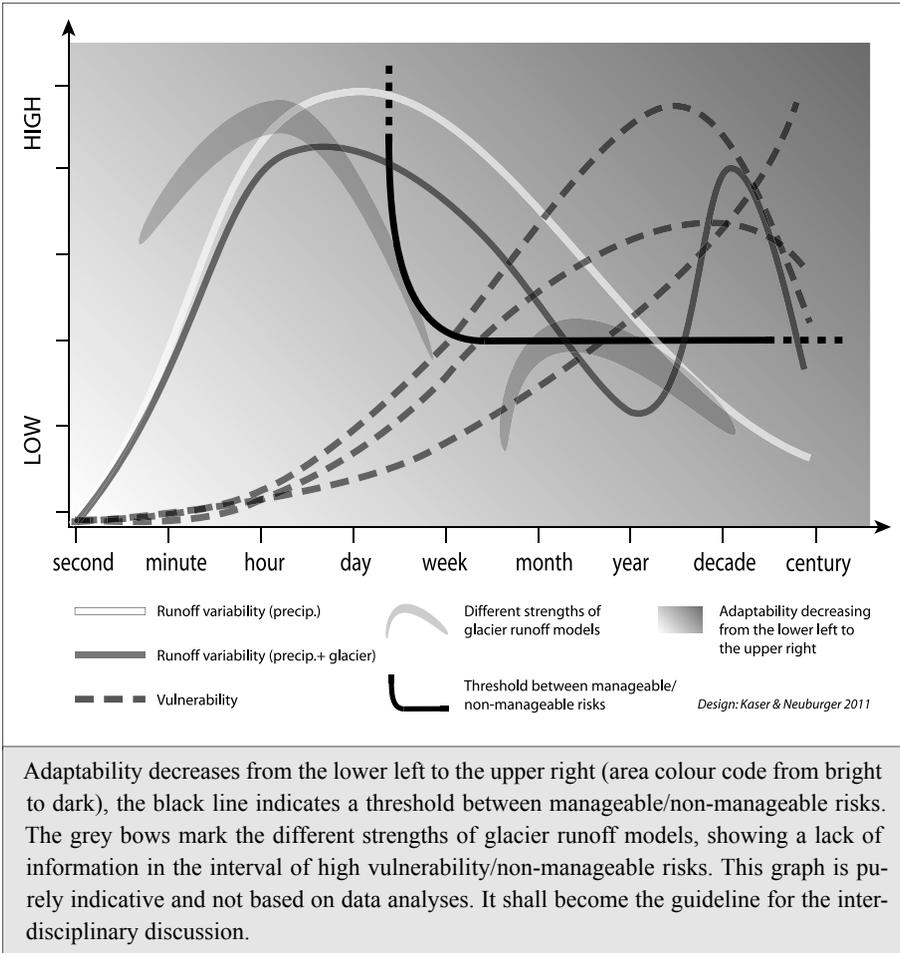


Figure 3: A conceptual approach indicating runoff variability and different user groups' vulnerabilities

Source: Design by the authors

These analyses are done with a process based 2D glacier mass balance model developed by MÖLG (et al. 2003; 2009a; 2009b), which needs topography, glacier outlines, atmospheric variables and vertical gradients (radiation, air temperature, humidity, wind speed and precipitation) as input. By routing the melt water output from the model with typical travel velocities obtained by tracer experiments from the glacier to the valley bottom hydrographs at different points downriver can be estimated. Furthermore, by doing sensitivity runs with the hydro-glaciological model, runoff scenarios for different climate conditions can be calculated.

Looking for a human-environmental framework we observe interdependencies between the impacts of climate change on glacier runoff and water availability, on the one hand, and socially and spatially differentiated vulnerabilities of households and community power relations, on the other hand (Figure 4). Present day variability of glacier runoff at different time scales and differences of demand-versus-availability of water influence traditional and modern strategies to cope with the glacier related variability in water availability/water scarcity. Climate change scenario-based predictions of water variability impact on the present household and community sensitivities and power relations as well as on discourses on water and climate change. At the same time, water engineering works and water distribution systems depending on power relations within communities and discourses modify water availability of each household. Thus, water conflicts are a result of interdependencies between temporally and spatially differentiated data and scenarios of water availability, the ways of communication of and discourses on these data including strengths and insecurities of science, water distribution systems and power relations as well as the specific relevance for stakeholders and user group.

## **6 Perspectives for future research**

Based on these preliminary results, future studies will focus on more details of the interdependencies between peasant vulnerability and glacier fed water provision along the Quebrada Shallap as a typical cross section from the city of Huaráz up to the glaciers above the high pastures in the past, today, and in projected future scenarios.

The following questions still remain unanswered:

- What are the temporal and spatial changes of household vulnerabilities to water scarcity?
- How do regional power relationships as well as national and international discourses on climate change influence water access?
- What are the magnitudes and time scales of climate related glacier runoff characteristics and their changes?
- Which elements constitute the dynamic interplay between household vulnerabilities and glacier fed water availability?

The major challenge will be to jointly explore time scales and magnitudes of glacier runoff variability and the respective relevance for rural families' vulnerabilities in order to identify temporal and spatial interferences of the natural and the societal processes. This shall contribute to understand the complex and heterogenic vulnerabilities of households to climate change and water availability by outlining the threshold between manageable and non-manageable risks. We also aim to identify potential chances and risks in the study area and scrutinise its suitability for extrapolating the findings to similar types of regions.

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## **Factors Affecting the Sustainability of Mountain Municipalities. The Case of the Municipality of Lonquimay, Region of La Araucanía, Chile.**

Carla Marchant (Santiago and Innsbruck) and Rafael Sánchez (Santiago)

### **Abstract**

Although the Andes play an important role in the development of Chile, the state of knowledge about them is scarce and partial. This indicates the need to deepen our knowledge about them from the perspective of sustainability. This research advances along these lines, identifying “mountain municipalities” according to natural and anthropogenic characteristics. The paper focuses on the case of Lonquimay, a municipality located in the region of La Araucanía, in the south of the country. Using a set of thirty indicators of sustainability, it was possible to characterise the social, environmental and economic situation of this municipality. The results obtained allow us to demonstrate that poverty, isolation and high unemployment rates are present in Lonquimay, and that these are challenges that must be locally addressed in order to achieve a better level of sustainability in this territory.

**Key words:** Mountain areas, Chile, Sustainability.

### **1 Introduction**

Mountains are highly sensitive to current global changes (MESSERLI and IVES 1997; MESSERLI 2010). Added to this and particularly in underdeveloped countries, these areas are characterised by their isolation and marginality, implying important challenges for their sustainability. In the Andes of Chile, a mountain range of over 4,000 kilometres, it is possible to find municipalities with varying levels of development, some of which present many negative processes that directly hinder and affect the sustainability of development. Such processes need to be identified.

Highlands account for over 20% of land surface and vary greatly in shape, size, altitude, flora and climate regimes. Mountains are thus highly heterogeneous areas and hold various financial resources. For example, mountain areas are hot spots of biodiversity, possess potentially marketable natural resources, are centres of cultural diversity and provide strategic environmental services (CHAVERRI 2002; BORSDORF 2004; AMÉZQUITA

2006; HÖDL 2006; STOIBER 2008; KOELLNER 2009; KANITSCHIEDER 2010; VIVIROLI et al. 2011; SPEHN and KOERNER 2010).

On the other hand, mountain areas are subject to anthropogenic processes that make them highly vulnerable areas, such as increased temperature levels and changes in the cryosphere as a consequence of climate change, the increase of extreme events of natural and socio-natural origin, the misuse of cultivation techniques, overuse or overgrazing, among others (KÖRNER 2005, 2009; MOSS 2008; DUKES and MOONEY 1999; PARMESAN and YOHE 2003; ROSENZWEIG et al. 2007; STEIGER 2008; BORSODORF and JANDL 2009; STÖTTER and MONREAL 2010; WIEGAND and GEITNER 2010).

Mountain areas in Chile account for over 80% of the country's land surface, and are a key natural factor in shaping the country's territory. The Cordillera is presented as one of the most distinguishing features of the relief of the country, and therefore influences the distribution patterns of human settlements. Also, from an economic perspective its importance for the country is unquestionable, as the mineral wealth it possesses makes it the main source of revenue. Indeed, it has been projected that in 2011 the share of mining in the country's gross domestic product will be around 6%, equivalent to more than 53 billion dollars (COCHILCO 2011).

Despite their importance, the mountains in Chile are sensitive, isolated and marginal areas. Chile is a country of mountains, but that does not seem to include the inhabitants of these territories. The development of the country has not included the small proportion of population living in the highlands, and because of this, these territories show indicators of a lower quality of life to that exhibited by the rest of the population of the country (located in the valleys). This situation turns mountain areas into negative locations for the retention and attraction of human capital and economic development. In this paper we will precisely show the main factors that explain the high level of vulnerability that the municipality of Lonquimay (located in the region of La Araucanía) presents, and that questions its ability to achieve sustainable development in the long term.

## **2 Mountains as a research subject in Latin America**

The Andes present one of the most complex, diverse and interesting orogenic systems on the surface of this planet. Extending over 7,500 kilometres, covering more than two million of square kilometres (km<sup>2</sup>), and shared by seven countries, the Cordillera shelters a rich biological, climatic and human biodiversity. The variety of ecosystems, represented by the moors of Venezuela, Colombia and Ecuador up to the north of Peru, and desert ecosystems, such as the highlands in western Bolivia, northern Chile, Argentina and southern Peru, has fostered the development of various settlement patterns, space utilisation and the exploitation of natural resources (CEPEDA and OYARZÚN 2006).

The research of mountain areas in Latin America has mainly focused its attention on the central and southern Andes, and north-eastern Argentina. The first studies were conducted by Europeans in the second half of the eighteenth century. The leading scientist Haënke Thaddeus, a Czech naturalist, arrived in South America as part of the famous expedition led by Alejandro Malaspina in 1790, and he visited the hills in Cordoba and San Luis. In Mendoza, after collecting more than 600 species of Andean flora, he crossed the Andes towards Chile. Later on, he travelled to Peru, Bolivia and northern Argentina, where he ascended the volcano Misti (5,300 m), quite a challenge for the time. Likewise, he visited Cuzco, Lake Titicaca, and travelled from Potosí to Cochabamba. He is considered a pioneer in the study of Bolivian flora. However, this period reached its zenith when the geographer Alexander von Humboldt explored the equatorial Andes in 1807, as a result of which the work “Reise in die Äquinoctial-Gegenden des neuen Continents” was published, in which he described the relationship between climate, altitude and vegetation that he had observed. This research gave Humboldt the status of a pioneer in the scientific study of mountains.

In the XIX century, many scientists inspired by the legacy of Humboldt sailed for South America. Between 1826 and 1832, the German botanist and zoologist Eduard Friedrich Pöppig made an exploratory trip to Chile, Peru and Brazil. In Chile in 1829 he ascended to the summit of the volcano Antuco (2,985 m) in the region of Biobío. This is considered the beginning of mountaineering in the country. Between 1834 and 1839, the English naturalist Charles Darwin made his exploratory trips to South America, Australia and the Galapagos Islands, where he wrote “A Naturalist’s Voyage”. This work describes the flora and fauna of South America, and tells of his experiences while exploring the mountain range along the coast of Chile, where he ascended La Campana to carry out geological observations.

Contemporary scientists have conducted in-depth studies of these spaces, which has permitted Andean diversity to be characterised in a geo-ecological manner (BORSODORF and HÖDL 2006;), and the subject of the culture and population of the mountains to be addressed (STADEL 1993, BORSODORF 1994, 1997, 2004). During the past decade the interest in climate change studies in the region (HEINE and NILLER 2004, JORDAN 1991, 2003) and risk management (SCHROTT 1996; GÖBEL 1999; ENDLICHER 2006) has also increased. It should be added that the Andes have been considered as a region of work by various international scientific bodies too. The network GLORIA (Global Observation Research Initiative in Alpine Environments), which studies trends and changes in biodiversity as a result of global warming, currently has nine monitoring stations (Ecuador, Peru and Bolivia with two stations in each country, and Colombia, Argentina and Chile with one station each), seven stations are still being planned, and four other institutions have expressed their interest in joining the network.

According to records of the “Forum of the Mountains”, an international network in charge of simulating and spreading the sustainable development of mountains in the world, in Latin America seven agencies are currently involved in active research with regard to mountain areas and are, in turn, affiliated to this interdisciplinary group. These are: Forum of Mountain Areas in Latin America and its email list, Consortium for the Sustainable Development of the Andean Ecoregion (CONDESAN) and InfoAndina, Andean Association for the Protection of Mountains, Network of the Central Andes-Peru, Mountain Jungles, Association for Farm Development and Network of Moors, and Latin American Network of Strategies towards Sustainability. These organisations focus their work on issues related to the rural economy, the innovation of traditional agricultural systems and the improvement of the quality of life of native peoples settled in the mountains (these are concentrated in Peru, Bolivia and Ecuador), as well as on the sustainable use of water resources.

### **3 The Chilean Andes**

In the case of Chile, the Andes have played a major role in the development of the country. From the geomorphological point of view, the Andes represent the most important morphogenetic unit in the configuration of the country, given that they spread over 4,500 kilometres; from a geopolitical perspective, they form the largest existing natural border; from a cultural point of view, they are home to many native municipalities, such as the Aimara, the Atacameños and the Mapuches, and are also part of the country’s heritage. Last but not least, and from a more economic perspective, metals such as copper, gold and silver are present here (SAGREDO 2006; NUÑEZ 2009).

Despite the importance of the Chilean Andes, initiatives, policies and scientific research whether of private or governmental nature remain insufficient and of limited temporal and spatial scope. The highest degree of attention achieved by the Chilean Andes in recent decades has been derived only from the tension occurring in these regions due to them being sources of vast economic wealth (ROMERO et al. 2009).

At present, there exists a diverse and complex set of legal regulations, public institutions and public-private partnerships, which to a greater or to a lesser extent have influence in the mountains. However, these regulations address only one aspect relative to these spaces, many are only of indicative nature, and they lack mutual complementarity. Mountain areas thus do not constitute legally recognised spaces, rendering planning relatively difficult (MARCHANT 2011).

Scientific studies on mountains in Chile are characterised by being addressed according to the theoretical background of each discipline, and are certainly restricted to a given geographical area only. Thus, for example, there exists research devoted to analysing the

geodynamic conditions of mountain ecosystems (SOTO and CASTRO 2003; SOTO et al. 2006; CASTRO et al. 2009), geological processes, tectonic displacement and mineralisation (SEYFRIED et al. 1998; MAKSAEV et al. 2009; NARANJO et al. 2010; MUÑOZ et al. 2010), archaeology, anthropology and ethnography of highland municipalities and the characteristics and diversity of the Andean flora.

Authors such as ROMERO (2002), ROMERO and VASQUEZ (2005), ROMERO et al. (2009) and MARCHANT (2011) have carried out research on mountain areas, and have stressed that the globalisation of the economy, represented by multinationals and their million dollar investments to extract natural resources, foster unresolved debates in Chilean society as to water rights, native communities, protection of the current diversity, weak environmental and territorial reorganisation policies, inefficiencies and clarity of the competences and attributes of government organisations. To the conflicts arising from investments of capital to exploit resources, some other issues are added triggered by a new environmental and cultural appreciation of mountain areas, an appreciation that has encouraged the permanent and sudden movements of population to more unskilled locations. This phenomenon, known as amenity migration, has been recently analysed in the centre and south of the country, and emerging issues related to the loss of land for agriculture, segregation and marginalisation, and conflicts of interests among old and new residents have been detected (HIDALGO et al. 2009; HIDALGO and ZUNINO 2010).

## **4 Sustainability of mountain municipalities in Chile**

### **4.1 Introduction**

MARCHANT (2010, 2011) has shown, from a geographic point of view, that in the mountain areas in Chile it is possible to identify certain tendencies, issues and imbalances related to the development of those municipalities present in this kind of relief. This same author identified 59 “mountain municipalities”, according to the current physical criteria and the effective use of the territory.

In order to identify the degree of sustainability of the development of mountain municipalities in Chile, a set of indicators was defined based on the model of the three classical pillars that make up the concept of sustainability: environmental, social and economic features. This model posits as a starting point that sustainable development can only be achieved if the objectives for each one of these pillars are implemented simultaneously and with the same degree of importance, so that not only do present conditions improve but that they may also be preserved for future generations (TAPPEINER et al. 2008).

Among the set of indicators defined, two types are distinguished according to their function. On the one hand, we distinguish between identification or status quo indicators (useful to determine the current status of a given situation and/or changes of a given

Table 1: Municipalities classified as “mountain municipalities” in Chile

<b>Big North</b>	<b>Small North</b>	<b>Central Area</b>	<b>Small South</b>	<b>Austral Zone</b>
Gral. Lagos	Diego de	Petorca	Curacautín	Aysén
Putre	Almagro	Putaendo	Vilcún	Cisnes
Camarones	Tierra Amarilla	San Esteban	Cunco	Lago Verde
Camiña	Alto del	Los Andes	Villarrica	Coihaique
Colchane	Carmen	San José de	Pucón	Río Ibáñez
Huara	Vicuña	Maipo	Lonquimay	Chile Chico
Pica	Paihuano	Lo Barnechea	Melipeuco	Cochrane
Ollagüe	Río Hurtado	Pirque	Curarrehue	O’ Higgins
Calama	Monte Patria	Machalí	Panguipulli	Tortel
San Pedro de Atacama		San Fabián	Cochamó	Cabo de Hornos
		Antuco	Chaitén	Laguna Blanca
		Alto Bio Bio	Futaleufú	Punta Arenas
			Palena	Río Verde
				San Gregorio
				Porvenir
				Primavera
				Timaukel
				Puerto Natales
				Torres del Paine

Source: Marchant 2010

characteristic over a certain period of time). This is the case with demographic and social indicators. On the other hand, evaluation indicators permit the tracking of progress or the downgrading of a given characteristic of a previously established objective. Likewise, these indicators permit us to determine whether the way in which a certain activity is carried out is sustainable or not.

To have a clearer perspective of the huge amount of data that each one of these indicators shows independently, a factor analysis was carried out with the help of the SPSS programme using the method of principal components, which helps to significantly reduce the number of highly interrelated variables without subtracting or losing relevant related information. This study permitted the establishment of a set of ten key factors, which explain to a varying degree the current state of sustainability in the mountain municipalities in Chile<sup>1</sup>. Bearing this in mind, attention now turns to the main factors that hinder sustainable development in the municipality of Lonquimay.

1 The factors identified are the following: dynamics and structure of the population, tertiarisation on municipality level, accessibility to basic services, access to state services, primary activities, social vulnerability, information technologies, protection of biodiversity by state laws, land degradation, biodiversity protection by the private sector. For more information see MARCHANT (2010).

## 4.2 Lonquimay: a mountain municipality

The municipality of Lonquimay is in the Province of Malleco, in the region of La Araucanía, and is located 147 kilometres from the regional capital, Temuco. It represents the largest communal territory of the region with 3,953.7 km<sup>2</sup>.

Located within the Cordillera de los Andes, its relief has been markedly carved by glacial action. It is located in the sub-basin of the Biobío River which originates from two lagoons: Icalma and Galletué. In this district a rainy cold temperate climate with Mediterranean influences is to be found (Cfsc). It presents high annual temperature variations with precipitation being concentrated in the winter months. The average annual temperature is 8.4°C, the warmest month is January with 15.5°C, and the coldest is July with 1.5°C. Annual precipitation is in the range of 1,850.6 mm, and June represents the month with the heaviest precipitation (325 mm). On average it snows 28 days a year.

According to the latest census (2002), the population of this municipality is 10,237 inhabitants, of whom 33.5% live in urban centres. The main urban community group is that of Lonquimay, founded on January 25, 1897 under the name of Villa Portales, with a population of 3,435 inhabitants (INE - National Institute of Statistics - 2005). The rest of the urban population lives in settlements such as Estación (72 inhabitants), Liucura (187 inhabitants), Sierra Nevada (150 inhabitants) and Troy (281 inhabitants). Most residents are descendants from Pehuenche families, who were, in turn, the native inhabitants of this territory. The geographical features of Lonquimay play a major role in the chances of sustainable development. Due to the climatic characteristics of the area, winters are extremely cold. Precipitation is present in the form of snow, which in some cases accumulates to reach three metres in height, often disrupting and impeding both inter- and intra-community communication<sup>2</sup>. This situation is worsened by the fact that road accessibility to the community is restricted to two tracks only (one paved and one gravel), which merge in the neighbouring community of Curacautín (Figure 1).

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2 Because of the heavy snowfalls, also called “white earthquakes,” Lonquimay is declared as a Zone of Agricultural Emergency almost every year. Given this status, the Ministry of Agriculture may make use of a dramatic increase in resources to coordinate actions and programmes to overcome a given emergency in the short term, for instance by supplying farmers and their families with their immediate needs: food delivery, livestock transportation, forage supply and replacement of infrastructure such as sheds, fences and greenhouses. In the mid-term, the grasslands, the programmes of the National Commission of Irrigation (CNR) and the health campaigns of the Agricultural and Livestock Service (SAG) have time to recover and pests and diseases are avoided. There is also the declaration of Area of Disaster, which allows, in the area of agriculture, the provisioning of medium-size farmers with technical and financial assistance. These financial measures permit interest to be written off and credits to be re-programmed. Last winter the regions of Biobío (Alto Biobío) and La Araucanía (Curarrehue, Melipeuco, Curacautín, Cunco, Lonquimay, Pucón, Villarrica and Vilecún) were declared Emergency and Catastrophe Zones by the national government, while the region of Magallanes (Timaukel, Porvenir, San Gregorio and Laguna Blanca) was only given the status of Emergency Zone.



*Figure 1: Precipitation during the winter of 2007*

*Source: Photos by the authors*

The relative isolation of this community is also evident in terms of its access to goods and / or basic services provided by the state, which are only available in Temuco, capital city of the region. This means that residents must travel over 2.3 hours to get to higher education institutions (universities and technical-professional oriented institutions) and hospitals with complex medical services. Regarding the availability of public transport, there are only two intercity bus companies connecting Lonquimay and Temuco, with three daily departures only (two in the morning and one in the afternoon), and a rural transport company that connects the various villages and hamlets in the surroundings. There is also a local aerodrome for private planes, but this is useless in winter.

From the perspective of the natural resources available to build up an economic base, steep terrains and the quality of the soil hinder the development of intensive agriculture; the area is only suitable for forestry and livestock (PERALTA 1980). In 2007 there were 1,644 farms (314,711.9 hectares), of which 1,476 were used for agricultural practices (262,119.2 ha) and 165 for forestry purposes (52,592.6 ha). As for the size of the farms, 27.3% are of less than 10 hectares each, and 46.9% correspond to farms of 10.1 to 100 hectares, while the rest might well exceed 2,000 hectares. In small farms the labour force essentially comes from the family group. On the rest the use of external help will vary depending on the type of exploitation and season. The techniques and livestock farming technology in use are simple and precarious. A large number of livestock (extensive) and a system of transhumance among the different ecological zones with eight summer pastures or natural grasslands are usually preferred (LÓPEZ 1990).

There are 877 individual farmers and forestry producers of Pehuenche origin, who own a total of 79,448.9 hectares. During the summer months they harvest the pehuén (pinion) which is the fruit of the Araucaria (*Araucaria araucana*), a basic ingredient in the traditional diet and also used as a commercial product.

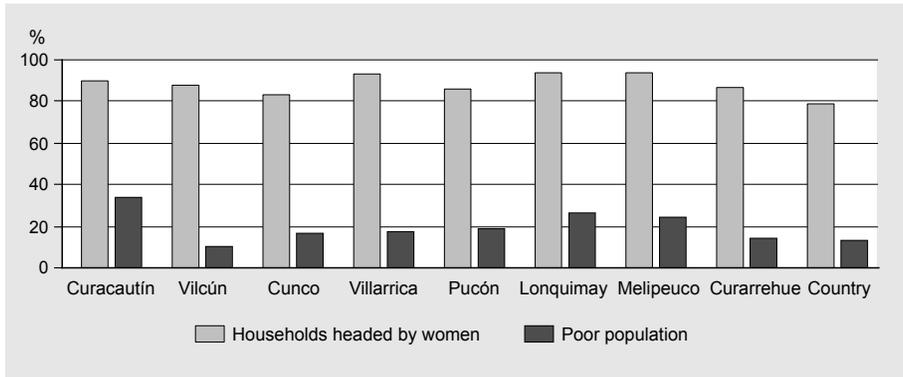


Fig. 2: Percentage of poor population and households headed by women in poor mountain municipalities in the region of La Araucanía

Source: Authors' draft; data base CASEN (Encuesta de Caracterización Socioeconómica Nacional), Ministerio de Desarrollo Social, Santiago de Chile 2006

As for the socioeconomic characteristics of the population, Lonquimay shows quite negative indicators compared to other mountain municipalities in the same region. 25.7% is the percentage of poor population of this community, well above the national average of 13.1%. There is a strong tendency towards a feminisation of poverty, i.e. 93.9% of poor households are headed by a female family member (Figure 2). This is fundamentally disturbing, considering that women have higher unemployment rates in general, lower and more precarious forms of job opportunities and lesser access to property ownership and control of economic resources.

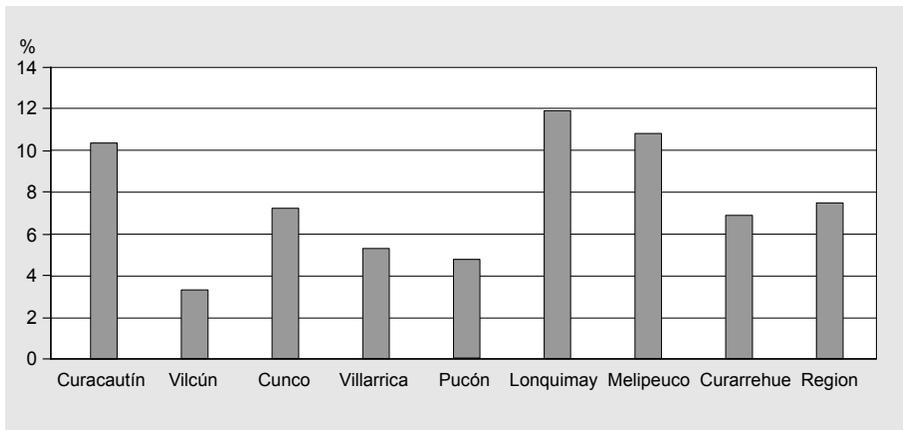


Fig. 3: Unemployment rate in mountain municipalities, region of La Araucanía

Source: Authors' draft; data base CASEN (Encuesta de Caracterización Socioeconómica Nacional), Ministerio de Desarrollo Social, Santiago de Chile 2006

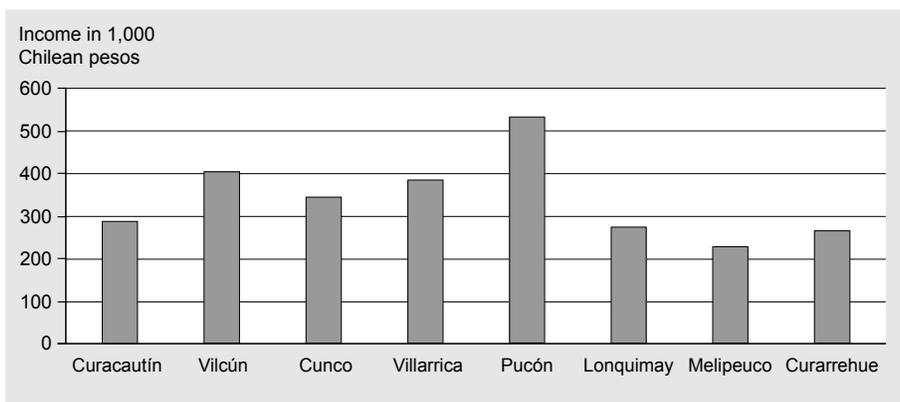


Fig. 4: Autonomous household income in mountain municipalities, region of La Araucanía  
 Source: Authors' draft, data base CASEN (Encuesta de Caracterización Socioeconómica Nacional), Ministerio de Desarrollo Social, Santiago de Chile 2006

Lonquimay leads the unemployment rate among mountain municipalities in the region of La Araucanía (12%), much above the regional average of 7.5% (Figure 3). This situation can be attributed to the farming profile of the area, the population characteristics (mostly of Pehuenche and Mapuche origin), and the forestry and agricultural practices of the region. Given these characteristics (65% rural population), most activities are related to land practices during the spring and summer months. The indigenous population (45% of the total of the community) tends to work in less formal activities, such as the harvest of the piñón (the seed of the pehuén), wood chopping, and other informal activities. Last but not least, due to the non-intensive characteristics of the forestry and agricultural activities, the labour force is practically non-existent and therefore cannot absorb the active population of Lonquimay. This situation, in turn, fosters negative migration processes of permanent (continuation of education, permanent jobs) and temporary nature (land activities).

The situation described above clearly explains why the autonomous household income, which corresponds to the total amount of money that a family obtains in the form of wages, surpluses, salaries, pensions and other sources, is far below average in the community. At regional level this household income amounts to 441,000 Chilean pesos<sup>3</sup>; nationwide the sum amounts to 735,000 Chilean pesos; in the case of Lonquimay, the sum is 277,000 Chilean pesos, i.e., 1.5 times below the regional average, and 2.6 times below the national average (Figure 4).

3 On 25 2011, the exchange rate of the U.S dollar to the Chilean peso was 466.75.

The economic vulnerability of household income is also reflected in the income of the municipality of Lonquimay, given that only 5.3% of all revenues correspond to self-generated income, while the rest comes from the Municipal Fund<sup>4</sup> (51.2%) and from extraordinary grants from state and regional government, many generated following the guidelines of the Area of Agricultural Emergency and Catastrophe laws.

## **5 Conclusion**

Mountain municipalities in Chile have different levels of development and some of them are affected by an important number of processes that become major barriers to achieving the sustainability long desired in these territories. The development of the country has not included the small population living in the highlands, and these territories thus show a lower quality of life indicators compared to those exhibited by the rest of the population (located in the valleys), a situation that makes mountain areas negative spots for the retention and attraction of human capital and economic growth.

In the case of the community of Lonquimay, the combination of physical characteristics (types of soil, climate, altitude, distance) and human characteristics (skills, technology, work opportunities, ethnic groups) generates serious challenges that impact on its development and sustainability.

However, there are also a good number of situations and phenomena that can become relevant when generating projects to foster and take advantage of the strengths and opportunities that the community offers, such as it being a natural border (to Argentina), it possessing an appreciable number of amenities associated with mountain environments, and its enormous fishing potential given the quality and purity of local water resources. Naturally, the existence of weaknesses and threats are challenges to be faced with plans in the mid and long term, in order to eliminate the strong “dependency” of both the inhabitants and the municipality on the regional and national governments. Thus risk management plans for mountain municipalities would enable the socio-natural, natural and anthropogenic threats that affect these territories to be correctly identified, while on-site early detection plans and more proactive mitigation and prevention measures should also be developed. It may well be expected that the government elaborate development policies and provide a legal framework to help the mountain areas of the country to correctly plan their strategic development.

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<sup>4</sup> The Municipal Fund is the main source of funding for Chilean municipalities, and it is defined as a „joint mechanism for redistribution of income among the municipalities of the country“, according to the Constitution of the Republic (Art. 122). This mechanism of redistribution of revenues among municipalities operates through higher contributions coming from other municipalities with more resources to help the operation of those municipalities with less financial stability.

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## **Indigeneity – from Stigma to Capital**

Martina Park (Erlangen)

### **Abstract**

Identity politics in Ecuador today tend to favour those who can claim an indigenous ancestry. As a direct consequence, the racial hierarchy which structured Andean societies since colonial times is increasingly challenged. Still, the stigma of indigeneity has not been completely dissolved. Those belonging or affiliating to an indigenous group claim that their ethnic identity provokes feelings oscillating between shame and pride in them.

The article opens a psycho-social and pedagogic perspective on the concepts of individual and group identity. It stresses the agency of each individual to positively define his or her self-identity and the group identity shared with other group members.

The *cantón* Yacuambi, located in Southern Ecuador, is populated by people who affiliate themselves with three different ethnic groups – Shuar, Saraguro and *mestizo*. This study applied qualitative research methods to gain insight into the relation between ethnic individual and group identities. One of the main arguments of this article is that the stigma of indigeneity partly consists of stigmatizing attributes independent of an indigenous background, for example living in rural areas or not performing a profession that requires formal education. Empirical data show how people living in the Yacuambi Valley attach positive meaning to these formerly stigmatizing elements and thereby are able to positively redefine their self- and collective identities.

### **1 Indigenous people in Ecuador – shedding stigma, controverting discrimination**

Until today, there seems to be a general agreement among social scientists and development practitioners that poverty represents a typical characteristic of indigenous people around the world (cf. EVERSOLE 2005, p. 29; HALL and PATRINOS 2006). The concept of indigeneity includes the experience of marginalization as one of the main criteria to define who is indigenous and who is not. As DAES (1996, p. 22) concludes in a UN working paper, one of the four defining criteria for the concept of indigeneity is the “experience of subjugation, marginalization, dispossession, exclusion or discrimination, whether or not these conditions persist”. The narrative of the poor and unprivileged Indian is also frequently employed by representatives of indigenous peoples themselves: The final document of the Conference on Indigenous People and Racism for example states that

one of the main causes for the on-going marginalization of indigenous people is the fact that non-indigenous people still hold the firm belief that indigenous cultures are inferior to their own (Indigenous Peoples and Racism Conference 2002).

For the Ecuadorian context, the anthropologist CASAGRANDE (1981, p. 260) describes the drastic extent of marginalization of those at the base of the social-racial hierarchy – namely people who are considered indigenous. He concludes that racism in Ecuador “is institutionalized to a degree that would shock many oppressed peoples elsewhere”. He also states in his article that hardly any uprising of indigenous people had taken place in highland Ecuador until the time he wrote his article in the 1980s. Since social inequality was not accompanied by social conflict, he proposes that Ecuador was facing a consolidated form of racism where “Sierra Indians and non-Indians have learned their respective roles of submission and dominance extremely well and almost unthinkingly put them into practice” (CASAGRANDE 1981, p. 261).

CASAGRANDE’s statements show that the social roles of indigenous and non-indigenous people are not essentialistic. They are social constructions and the adequate behaviour within these social roles therefore needs to be *learned* by all of the actors involved. He also implicitly introduces the entangled concepts of stigma and discrimination. Stigma comprehends processes of self-categorization whereas discrimination refers to processes of others who label someone bearing a salient attribute (cf. GEISELHART 2009). Stigma and discrimination are generally seen as interdependent. Both, stigmatization on the side of the bearers and discrimination from the non-bearers, most likely lead to an avoidance behaviour on both sides and therefore to social differentiation.

According to GEISELHART (2009) it is crucial for any kind of identity research to distinguish between identities being shaped on the level of society (= structural and linguistic dimension, often termed as social identity) and identities which evolve from everyday experience of social encounters (= individual dimension). The structural dimension is commonly transported by any kind of representation and is instrumentalized for the use of identity politics. The narratives told with any implicit reference to this structural dimension are sometimes challenged or even contradicted by individual experiences: Through their experiences with social reality and within everyday social encounters marginalized people can develop individual identities that may challenge existing negative images of their respective social groups.

### **1.1 The ambivalence of ethnic collective identities: limiting or enabling?**

Ethnicity is commonly defined as otherness and much traditional work on ethnicity discusses how a person discriminates between “me/us” and “you/them”. These authors try to

understand how people distinguish between what they perceive to be “the same” as them and where there is a difference that needs to be responded to or rather, from where on a boundary is established. BARTH (1969) shows that ethnicity – in its traditional sense – is all about constantly constructing and reconstructing different social groups. This process is commonly translated into space by linking “me/us” with the geographical “here” and “you/them” with the “over there” (GLASZE and MATTISSEK 2009, p. 42).

Much of the work on ethnicity hence produced and received by the scientific community is centred on practices of differentiation including spatial separation and the (re)production of social hierarchies. Within this framework, ethnicity is often part of the discourses evolving around migration, conflict and social inequality (cf. e.g. GEISEN 2009, p. 248). All load the term ethnicity with negative connotations. This can be seen as a cause or consequence of the common assumption that the loss of tradition and the suspension of formerly reliable constancies in an increasingly globalized world inevitably lead to a loss of identity (cf. e.g. HOCHBERG 2004 and critical voices from an economic perspective by DISDIER et al. 2010 and OLIVIER et al. 2008).

Besides the structural understanding of (ethnic) identity, there are – perhaps less well known – concepts of ethnicity rooted in socio-psychology and pedagogy. Authors of these disciplines focus on individual human agency and the importance of each individual’s practical experience. KEUPP argues for example that identity work, which he apprehends as a process in which people search for an understanding of themselves (KEUPP 1997, p. 12) should be conceived as a “risky chance” (ibid, p. 19). To him, the assumption that globalization is inevitably followed by the loss of (cultural) identity does not unconditionally hold true. People can actively create not only their individual identity, but – via the negotiation of common values and standards – also the collective identities they associate with KEUPP’s perspective of identity as a – ever so risky – chance challenges the conventional way of seeing ethnicity as a euphemism for the marginalization and discrimination of (ethnic) minorities.<sup>1</sup> GEISEN similarly stresses the ambivalence of ethnicity as the base of discrimination and disadvantage, but also as a resource for social networks and as highly relevant for the personal development of each individual (GEISEN 2009, p. 248).

KEUPP and GEISEN argue mainly on an individual level regarding self-identities (= the understanding people have of themselves) and individuated identities (= the understanding of an individual by others). The interdependencies between individual identities and identities formed by groups of people are of special interest for the following case study. Similarly to the differentiation between self and individuated identities I use the terms

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<sup>1</sup> Concerning the use of the concept of ethnicity for numerically dominant groups, cf. e.g. SMITH 2004 or HIEBERT in his entry for the Dictionary of Human Geography: “Many use the term [ethnicity] only to refer to minority groups, assuming that people in the majority are ‘normal’ while everyone else is ‘ethnic’” (HIEBERT 2009, p. 215).

social identities for group identities that are constructed by non-group-members and projected upon group members and collective identities, which I define as social identities consolidated by group members with a sense of cohesiveness.

## 1.2 Victims turn into actors – positive ethnic identity redefinition in Ecuador

Extensive literature exists about the empowerment of indigenous people in Latin America and around the world. It has long been acknowledged that ethnicity and indigeneity as two manifestations of social identities have turned into a resource for the respective groups (BÜSCHGES and PFAFF-CZARNECKA 2007). Using ethnicity as a political instrument is by no means a new phenomenon in Latin America: In colonial times a system of segregation based on ethnic differentiation was established (KALTMEIER 2007). Who makes use of ethnic differentiation has however recently changed: Whereas it used to be an instrument in the hands of the majority that served to exclude those bearing certain characteristics and confine them to lower strata of society, it is employed today by members of ethnic minorities to claim collective rights and an acknowledgement of their existence and distinctiveness.

The following case study shows how indigenous people in Southern Ecuador are redefining the meaning and significance of their respective group identities. By this redefinition, they are enabled to:

- combat and successively dissolve the stigma they are bearing and
- insistently defend themselves against discriminating acts of people who are not affiliated with their group and have stereotypes that justify discrimination from their point of view.

## 2 Rural communities, ethnic heterogeneity – a case study

In addition to a variation of landscapes, climates and biological habitats, Ecuador is also characterized by a rich cultural diversity: As the smallest Andean country whose area is approximately the size of Great Britain, Ecuador includes fourteen indigenous nationalities that are officially recognized by state authorities (cf. CODENPE 2012b; INEC 2006). Each has its own language, tradition, history and *cosmovisión*.

After a period when ethnic diversity was widely denied and the introduction of a new identity category called *mestizo* to create equality among all Ecuadorians, Ecuador's recent ethnic politics increasingly demonstrate an appreciation towards the existence of a wide range of discriminable ethnic groups. Politicians and state authorities now officially advocate their recognition and promotion. Against this background, I conducted

an empirical study to gain deeper understanding of the relevance of ethnic affiliation for individuals in rural Southern Ecuador.

I conducted my fieldwork in five communities along the Yacuambi River in the Zamora Chinchipe province.<sup>2</sup> I selected the study site because of its ethnic heterogeneity: people living in the Yacuambi Valley relate themselves to three different ethnic groups.<sup>3</sup>

The **Shuar** are usually seen as autochthonous for the Amazonian lowlands of south-eastern Ecuador and north-west Peru. Their traditional livelihoods were formerly – and to some degree still are – based on hunting, fishing, and gathering, accompanied by subsistence farming of low intensity. The Shuar underwent a remarkable organizational change as an ethnic group: Formerly an acephalous group, they were the first ethnic group in Ecuador to become politically organized (BECK and MIJESKI 2000, p. 121). App. 40.000 people affiliate themselves with the group of the Shuar today (RUBENSTEIN 2005, p. 29<sup>4</sup>). They are organized in *centros* on the community, *asociaciones* on the regional, and *federaciones* on the national level (GERIQUE ZIPFEL 2011). Of the three ethnic groups living in Yacuambi, the Shuar are probably the closest to the romanticized notion of the Amazonian Indian. They are described as “typical forest dwellers, who practice shifting cultivation, mainly with a subsistence economy” (POHLE 2008, p. 26).

The **Saraguro** represent another officially acknowledged indigenous nationality of the study area. They originally inhabited the area around the town of Saraguro in the highlands of the adjoining Loja province, and have started to migrate into the Yacuambi Valley at the beginning of the 20<sup>th</sup> century (MASSON 2005, p. 78). Similar to the much better known group of the Otavaleños, the Saraguro have always been economically quite successful. As demonstrated by BELOTE SMITH and BELOTE (1984, pp. 26), this prosperity has however not prevented the scorn from white or *mestizo* people.

The *mestizos* are the least clearly outlined of the three ethnic groups living in Yacuambi Valley. Since this article does not allow a full discussion of the entangled concept of *mestizaje*, I would like to refer to the pragmatic definition by BECK and MIJESKI (2000, p. 124): “To declare that one is a blanco or *mestizo* is essentially to assert that one is not “un indio”. Blanco and *mestizo* thus remain amorphous and residual categories, bereft of ethnicity and intended in common usage not so much to tell others who you are as who you are not”. They also describe the category of the *mestizos* as “transparent” and “con-

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2 Fieldwork was funded by the German Research Foundation (DFG) to which I owe thanks for the financial and logistical support.

3 I am aware of the epistemological trap I run the risk of falling into when naming and describing ethnic groups. I however chose to give in to this form of essentialism because I believe it is a necessary prerequisite for understanding the setting of this study.

4 Numbers by CODENPE (Consejo de Desarrollo de los Pueblos y Nacionalidades del Ecuador) are much higher and state the Shuar count 110.000 people (CODENPE 2012a, data from 1998).

tentless” (ibid.). This statement is confirmed by POHLE (2008, p. 31), who observes that *mestizos* in Southern Ecuador “have little tendency to identify themselves as a distinct ethnic group of regional culture”.

## 2.1 Empirical data: Qualitative Interviews and Grounded Theory

I mainly conducted individual guided interviews to gather empirical data. Fieldwork was divided into three phases: August/September of 2007, February/March 2008 and September to November 2008. I accordingly classified the interviews into three different “generations” which differ by focus, my interviewing skills, and the amount of information and knowledge already gained about the region and its inhabitants.

I conducted, electronically recorded, and transcribed a total of 35 interviews and analysed them using the ATLAS.ti™ software. For 27 interviews I employed the following formal outline:

- conducted individually,
- along a written guideline,
- with interview partners permanently living in one of the studied communities.

Additionally, eight expert interviews were conducted with persons having special insights into aspects of ethnic affiliation in the study area.

## 2.2 Elements of stigma: Accumulating “backwardness”

There are many historical aspects that have created an ethno-social stratification in Ecuador which placed people of non-European ancestry at the bottom of the social hierarchy. In this article I would like to introduce the idea that nevertheless indigeneity does not “naturally” lead to stigma and discrimination. There is however a variety of stigmatizing elements that are often combined in the life world of many indigenous people, not only in Ecuador. Among these elements are:

- the fact that most people who are considered to be indigenous live in the countryside, which is itself considered a reservoir of backwardness,
- the general lack of formal education combined with not practicing a profession that requires specific job training, and
- the dedication to subsistence activities such as small-scale farming, hunting, fishing, and gathering.

In the following part of this article, I will focus on two of these stigmatizing elements. I will describe people’s actions and efforts to re-label these elements and demonstrate how their effectiveness on the creation of stigma and discrimination is thereby reduced.

### 2.3 The geography of ethnicity: White cities vs. indigenous rural-ness?

Identities are constructed in constant engagement with one's social and physical environment. Places and their symbolic meanings – assigned by individuals or groups – are often part of self- or collective identities. This is especially true for ethnic identities: WADE (1997, p. 18) noted that ethnicity and culture mainly use a language of place. The perception of sameness and difference is often based on the question “Where are you from?” which WADE therefore refers to as the “‘ethnic question’ par excellence”.

Likewise, the togetherness of national identity and territory is often unquestioned. According to the territorial concept of nation states, a certain citizenship guarantees free access to certain spaces. Outside the national territory, access is controlled by bureaucratic acts like visa or agreements between states (cf. e.g. RADCLIFFE and WESTWOOD 1996, p. 108; BAUERKÄMPER 2004, p. 33). The question whether territory is also a *sine qua non* for ethnic groups, is increasingly challenged by authors within the field of cultural studies (cf. e.g. the concept of deterritorialisation by GARCÍA CANCLINI (2005, p. 229), who describes the “loss of the ‘natural’ relation of culture to geographical and social territories”). The identity/territory nexus is nevertheless still existent from the emic perspective of indigenous groups in Ecuador, especially in the Amazon (PERREAULT 2001).

One of the most convincing means to display the identity/territory nexus are thematic maps that show ethnic groups and their respective territories. PEQUEÑO BUENO (2007) used these ethnographic maps for her analysis of the representations of indigenous women in Ecuador. RADCLIFFE and WESTWOOD (1996) came to similar results when they interviewed Ecuadorians from different ethnic backgrounds about where they think certain ethnicities live in the country. Their findings illustrate Ecuadorians' imaginative ethnic geographies via mental maps: even though the Ecuadorian population is locally diverse, “there are persistent stereotypes about where different groups are located in the nation” (RADCLIFFE and WESTWOOD 1996, p. 112). RADCLIFFE's and WESTWOOD's results are consistent with the findings published by PEQUEÑO BUENO (2007) that the classic rural-urban dichotomy is effectively translated into an ethnicised geography: White people are commonly expected to live in the major cities, whereas indigenous people are imaginatively spatialized in rural areas and communities.

Even though there are more and more people of indigenous affiliation that internally migrate to urban agglomerations (DEL POPOLO et al. 2007), the association of indigeneity and rurality is often stated as a matter of fact by scholars and development practitioners: As KORZENIEWICZ (2000, p. 58) summarizes the studies by PSACHAROPOULOS and PATRINOS (1994) and the World Bank Group (17.04.1995): “The indigenous population is predominantly rural, often living in relatively inaccessible or marginal areas”.

Another common association linked to rurality is poverty. On the one hand, supra-national and national developmental organizations dedicated to the so-called third world claim that there have been remarkable advances in the reduction of economic poverty. On the other hand, they stress that what is left of poverty is often located in rural areas. According to the World Development Report of 2008, “75 percent of the developing world’s poor live in rural areas whereas only 58 percent of its population is rural” (The World Bank 2008, p. 45).

RIGG (2008) summarizes information gathered and published by THOMPSON (2003; 2004) and strikingly contrasts the implicit assignations of meaning of rural-ness and urban-ness: Not only do THOMPSON’s studies confirm the above named assumption of rural areas being received as agriculture-focused and subsistence-orientated, but the rural identity he extracts from his empirical work is described as “[b]ackward-looking, ignorant, uneducated, lacking motivation”, whereas urban-ness supposedly produces identities that are “[f]orward-looking, aware of the world, sophisticated, disciplined; educated” (RIGG 2008, p. 115, table 5.7). As RIGG rightly observes, THOMPSON implicitly equates urban-ness with modernity (RIGG 2008, p. 116).

Even though THOMPSON worked in a Malaysian context, his findings are interesting for the research question followed here: What consequences do such unscrutinized, implicit but quotidian meaning systems – in this case the linkage between indigeneity, rurality, poverty and backwardness – have for the ones directly affected? Rather than asking if it is “true” that a great percentage of indigenous people live in rural areas or if a majority of them is poor, the important question is how these beliefs affect their self and collective identities. In other words: Does the common notion of rurality as structurally disadvantaged and poor because of “the unequal land distribution and [...] the uneven power system” (KAY 2005, p. 318) necessarily affect how people in rural areas construct their identities?

### **3 Experiences from the field: Rural imaginatives in the Yacuambi Valley**

For the analysis of interviews I used the term *el campo* to have a closer look at how people of the Yacuambi Valley – a clearly rural area – feel and think about rurality. The concept of *el campo* ranges much further than the English *countryside*. Derived from Latin *campus*, it originally referred to cropland or fields. Even though it has maintained a strong sense of agriculture, its connotations in the studied area are diverse and sometimes contradictory. My interview partners mainly referred to the concept of *el campo* in three meaning systems:

- *el campo* as a place, opposed to cities or other more densely inhabited areas,

- *el campo* as a resource, a base for livelihoods and for self-employment, accompanied by a set of typical agricultural activities and physically strenuous work,
- *el campo* as a way of living and a space of freedom.

The first meaning, *el campo* as an opposite of the city, does not seem surprising. Even though the dichotomy rural-urban has long been replaced by the concept of a rural-urban continuum, it certainly keeps structuring the imaginations of our everyday life. It is interesting however which characteristics are assigned to either the countryside or the city by the people living in the Yacuambi Valley.

One interview partner was concerned about the disappearance of differences between city and countryside<sup>5</sup>: He affiliates life in the city with the presence of well-off people and worries to become a victim of their bad treatment and to be at their free disposal if the assimilation between countryside and city progresses. He indirectly associates life in rural areas with safety, liberty, and self-determination, whereas “the city” means repression and exposure to arbitrary treatment.

As mentioned above, scholars and development practitioners generally assume that “the rural world is an agricultural one where farming predominates and where land is the most critical resource” (RIGG 2006, p. 180). Different interview partners also referred to *el campo* in the sense of *land* as the base of livelihood. The concept of *el campo* as a resource includes the assumption that if land is available to a person, it lies entirely in his or her hand to make a living from it. The following statement was given by a Shuar woman:

“Si decimos: ‘soy pobre’, sería pobre porque soy vago. Eso sí. El Shuar no es pobre. El Shuar es rico. Por todo lo que tiene: la naturaleza, el campo, el aire libre, el agua libre. Todo. Somos ricos.”<sup>6</sup> (PD<sup>7</sup> 06: 021).

With her idea of wealth she clearly counters the implicit but ubiquitous idea of rural agricultural areas being poor.

The third concept of *el campo* as a lifestyle includes the idea of rural areas as being healthier than densely populated places. The countryside is seen as quiet and peaceful, al-

5 “Será que tal vez aquí en el campo vaya ser como en las ciudades grandes, dicen que también, sí, ya existe, porque el humilde siempre es manejado por los millonarios, humillado, lo tratan como les parezca, le hacen trabajar en.. como un esclavo con un sueldo bajo.” (“Maybe here in the countryside it will be like in the big cities, they say that it already exists, because the humble ones are always manipulated by the millionaires, humiliated, they treat one as they like, they make one work... like a slave with low wages.”) (PD 15: 102).

6 “If we were to say: ‘I’m poor’, I would be poor because I am lazy. That’s it. The Shuar is not poor. The Shuar is rich. For all he has: nature, land, free air, free water. Everything. We are rich.”

7 PD stands for Primary Document. It refers to documents which are derived from transcribed interviews and are integrated into a hermeneutic unit of the qualitative data analysis software ATLAS.ti™.

lowing for self-determined work, and featuring ample space and time. One Shuar woman commented:

“Porque nunca veían enfermedad, eso en gripe, tos, nunca veía el Shuara. En campo vivía Shuar sano.”<sup>8</sup> (PD 20: 74).

Similarly, wild fruits and vegetables – as opposed to commercialized products, even though they are not processed – are commonly named with the adjunct *del campo*. One interviewed person from the group of the Shuar drastically sketches the consequences of the consumption of “unhealthy” food bought in the market:

“Si más comemos del campo, tendríamos más vida. Si comemos de los mercados, poca vida. Porque es ... todo es veneno del mercado.”<sup>9</sup> (PD 10: 178).

“Natural” food from the countryside is thus perceived as the epitome of health and spiritual purity. Interview partners mentioned several times the opportunities they felt to have in the countryside, which wouldn’t be offered to them the same way if they lived in urban areas. Among them were animal husbandry, the possibility to work self-determinately and free access to resources such as water. As the above citations show, people from the Yacuambi Valley identify themselves with the place they live in or with the life in a rural area in general. One interview partner was quite outspoken about his “rural” identity:

“Mi vida es estar en el campo.”<sup>10</sup> (PD 10: 139).

But instead of the implicit assumption that rural-ness is intertwined with backwardness, disadvantage, and restricted opportunities (*Lebenschancen*), interview partners associated positive features such as health, freedom, security, and resource accessibility with living in a rural area.

### 3.1 The education-progress link – reinterpretation by people with an indigenous background

The firm belief that formal education improves life chances is deeply rooted in people around the world and has been present in the Americas for at least 150 years (REIMERS 2000, p. 10). It was also frequently expressed in the interviews of this study.<sup>11</sup>

8 “Because they never saw illness, anything of flue, cough, the Shuar never saw any of that. In the countryside the Shuar lived healthy.”

9 “If we eat more from the countryside, we will have more life. If we eat from the markets, little life. Because it is... everything from the market is poison.”

10 “My life is to be in the countryside.”

11 There was an interesting accumulation of combined use of the expressions *prepararse* (get prepared), *salir adelante* (moving ahead in the sense of progressing) and *educación* (education). Interview partners often expressed the wish that their children receive a formal education in order to lead a less strenuous and physically demanding life.

Like with the other elements of stigma, the conventional portray of indigenous people in Latin America or Ecuador is not favourable regarding education: their image strikingly lacks the endowment of formal education. This portray is again confirmed (and maybe to some part created) by the reports of supra-national institutions: The study on indigenous opportunities in Ecuador by BORJA-VEGA and LUNDE, which is part of the Worldbank Report on “Economic Opportunities for Indigenous Peoples in Latin American” (PATRINOS and SKOUFIAS 2007), states lower endowments of human capital (health and education) for indigenous households (BORJA-VEGA and LUNDE 2007, p. i). The article by LARREA and MONTENEGRO TORRES includes a table of the number of years of schooling for different income quintiles in Ecuador. The authors conclude that “indigenous individuals were consistently worse off than the rest of the population” (LARREA and MONTENEGRO TORRES 2006, p. 77).

In some cases, authors seem to find it difficult to bid farewell to the conventional portray of the uneducated Indian: In an elaborate study on the correlation between education and ethnicity in Ecuador, GARCIA ARACIL and WINKLER (2004, p. 55) comment on the long-lasting association of indigeneity on the one hand and poverty and lack of education on the other. Even though their results do not indicate statistically significant differences between urban and rural schools or between indigenous and non-indigenous schools, the authors assert that both rural and indigenous schools have negative effects on their students’ life chances (GARCIA ARACIL and WINKLER 2004, p. 84).

### **3.2 Education and its Role in Identity Politics**

Historically, formal education has been instrumentalized in Latin America by political elites: One form of institutional discrimination was implemented by the Ecuadorian suffrage law, which named literacy as a requirement to vote until the late 1970s and hence practically excluded indigenous people from the ballot (DE LA TORRE 2006, p. 249; cf. also STRÖBELE-GREGOR 2004, p. 4). Another, maybe unexpected and highly controversial way of instrumentalization, is the role of education in processes of nation building: DE LA CADENA drastically describes how in Peru formal education served to “civilize” the illiterate and incorporate the “retrograde rural dwellers” and Indians, who were regarded “the quintessential illiterate population” (DE LA CADENA 2005, p. 271), into the national community.

DE LA CADENA (2005, p. 271) draws on a Peruvian adult literacy book that was published in 1950 by the Ministry of Education. The protagonist of the book, a man named Pedro, is illustrated with features that easily recognize him as a peasant of indigenous background. She successfully captures the image that is co-transported by this kind of illustrations and that usually “goes without saying”: “Pedro, and all Indians like him [...] are presented with the backwardness, difficulties, and discomfort of their traditional material life. They

are nice, hardworking people, yet they live in misery, they are told. They lack education” (DE LA CADENA 2005, p. 271).

### 3.3 Getting prepared to design the future

People in the Yacuambi Valley generally hold education in high regard. No difference between the ethnic groups regarding their appreciation of formal schooling could be identified from the interviews. One interview partner even stressed that all three groups of the *cantón* participate equally in “getting prepared”:

“Tanto el Shuar como el mestizo se están preparando. Shuar, el indígena, el mestizo. Están preparándose ya. Se ve más bien dicho ya en las aulas tanto de los colegios de aquí del cantón como los otros de la cabecera cantonal, de.. de Zamora también, como el colegio de Guadalupe, que hay Shuar, indígena y mestizo. Que están involucrados.”<sup>12</sup> (PD 09: 65).

Another interview partner describes his efforts to attend school: Long distances required a strong will and great stamina in order to graduate (cf. PD 08: 98).

“Getting prepared” (*prepararse*) is an idea frequently mentioned in the interviews. It is in some cases connected to an altruistic approach: Some of the younger interview partners enunciated the wish to leave home to receive high quality education in one of the major cities Loja, Cuenca, or Quito. This was however always connected with the idea to come back to let the home community profit from the individual gain in skills and knowledge:

“De ahí seguir estudiando y prepararme para poder servir a la sociedad.”<sup>13</sup> (PD 08: 70).

### 3.4 Bilingualism – part of human and social capital

Bilingual education has been established in Ecuador since the early 1990s (cf. HORNBERGER 2000, p. 180). Within the study area, there are three different types of primary schools: hispanic, bilingual for Shuar, and bilingual for *quichua*. In some of the study communities, two or more of the different school types operate. This leads in some cases to quarrels with an ethnic coloration between the inhabitants.

12 “The Shuar as much as the *mestizo* is getting prepared. Shuar, indígena [Saraguro], the *mestizo*. They are getting prepared already. You can see them, in other words, in the classrooms of the canton’s colleges like in the ones of the canton’s capital, of... of Zamora also, like in the college of Guadalupe, that there are Shuar, indígena [Saraguro] and *mestizo*. That they are involved.”

13 “From there on go on studying and prepare myself in order to be able to serve society.”

Language represents the most frequent ethnic marker in the interviews (along with dress and hair-do for the Saraguros). The importance to know an indigenous language (in the case of this study Shuar for the Shuar and *quichua* for the Saraguro) was expressed frequently in interviews and informal conversations. Indigenous language skills are not only seen as human capital in the sense of knowledge, but are an important part of social capital, too: One interview partner, who works as a nurse, stated that she feels that people “from the countryside” trust her more easily than her *mestizo* colleague because she speaks *quichua*:

“Poder hablar quichua, ellos también relacionan conmigo y... y hablan. Especialmente la gente de campo. Ellos hablan dos idiomas, castellano un poquito y quichua más. Entonces yo cuando voy a la comunidad siempre... este... hablo quichua, entonces en donde ellos tienen más confianza hablar conmigo.”<sup>14</sup> (PD 23: 57).

In another case, indigenous language skills opened job opportunities in a bilingual kindergarten run by a Saraguro institution in one of the communities:

“Es de habla quichua y tenemos que entrar uno que sepa quichua. Ya, yo hablo quichua. Entonces, ellos no supieron la lengua quichua, ya pues, era imposible que entren allí a trabajar. Entonces, por eso tuve apoyo y... estoy trabajando hasta ahora.”<sup>15</sup> (PD 10: 71).

CANESSA (2005, p. 4) describes for a Bolivian setting how the knowledge of an indigenous language is rated differently for indigenous and non-indigenous people: “In Bolivia today the ability to speak an indigenous language is highly valued among educated urban people as it is a useful passport to a job with an NGO; speaking an indigenous language as a rural and uneducated person serves as a marker of one’s inferior social status”. Similarly, interview partners in the Yacuambi Valley expressed shame as well as pride for speaking an indigenous language. In one case, the interview partner illustrated his personal turn in the appreciation of his native tongue: As a boy, he often felt ashamed for his parents and grandparents when they spoke an indigenous language (Shuar in his case) in public. Later, on a trip to Morona Santiago, where the Shuar population is far bigger than in Zamora Chinchipe, he encountered girls who spoke Shuar and who laughed about him when he insisted that he also belongs to the group of the Shuar. Because of his poor knowledge of the Shuar language they did not believe him. For the interviewee, the

14 “Being able to speak quichua, they also relate with me and.. and talk. Especially people from the countryside. They speak two languages, a little Spanish and more quichua. So, when I go to the communities, always... I speak in quichua, so with that they have more trust to talk to me.”

15 “It [the institution] is quichua speaking and someone who knows to speak quichua had to enter. So, they [*mestizo* competitors] did not know the language quichua, so, it was not possible for them to enter there to work. So, for that reason I got support and... I keep working until today.”

shame to speak an indigenous language turned into the shame *not* to speak an indigenous language. This experience evoked the wish to learn his native tongue(cf. PD 05).

I cannot make any statements on the quality of formal education within the study area or on the differences in school enrolment and achievements of the different ethnic groups based on the empirical data gathered for this study. What can be noted though, is the increasing value indigenous people in the *cantón* Yacuambi attach to language skills which they exclusively derive from their respective collective identities. The most self-confident even argue that because of their language skills, they are superior to those who just speak Spanish:

“Eso quiere decir que [...] el alumno que está preparandose en la escuela bilingue es superior a lo de la hispana.”<sup>16</sup> (PD 10: 67).

#### 4 Conclusions

Many Ecuadorians of different ethnic backgrounds still believe in the existence of a stable social hierarchy with white people at the top and black and indigenous people at the bottom (cf. ANDRÉS 2008, p. 12). They typically assume that “[t]he Indian wants to be a *mestizo*, the *mestizo* wishes to be white, and the white yearns to be a gringo” (DE LA TORRE 1999, p. 108, cf. also DE LA CADENA 2005, pp. 260, where she cites from a census report in Cusco). This view is however contested by an on-going and increasing institutionalization of indigeneity in the country.

The “political awakening” of indigenous groups in Latin America and Ecuador has been described and analysed in numerous publications (e.g. LARREA and MONTENEGRO TORRES 2006, p. 68; YASHAR 2005; LANGER and MUÑOZ 2003; WARREN and JACKSON 2002; MADER and SHARUP 1993). As BECK and MIJESKI observe, these political movements represent an attempt by indigenous groups to “gain some control over ‘definitional rights’” (BECK and MIJESKI 2000, p. 134), after a long period of colonial powers and their successors defining who is indigenous.

In the process of indigenous groups (re-)gaining power over the definition of their social identity individual members are given a broader scope of action (*Handlungsspielraum*) to redefine their self-identity positively. How they put this newly gained agency into practice depends on personal traits and the way the respective social groups as a whole deal with it. Some people might not feel the need to get involved with questions of ethnic identity but are virtually forced to do so because of the intense involvement on the level of their respective social groups. These people might perceive this agency as a burden

<sup>16</sup> “This means that the pupil who is preparing him/herself in a bilingual school is better than the one from a hispanic school.”

and feel that they are risking losing the game of re-defining their identities. Others, again, seem eager to seize the favourable opportunity to counter stereotypes and prejudices that have been applied to their group. From my perspective, this issue is well captured in KEUPP's notion of a "risky chance" (KEUPP 1997, p. 19).

The above paragraphs described how people in Southern Ecuador are challenging existing stereotypes that have stigmatizing effects and contribute to the image of the poor, uneducated Indian. In addition to the collective benefits of the successful mobilization of indigenous political groups and the increasing recognition and implementation of indigenous rights, individuals also profit from new possibilities to re-define their individual (ethnic) identity and the ability to develop a more positive understanding of themselves. LOURY (2002) and HOFF and PANDEY (2005; 2006) showed that stigma and negative self-perception have an enormous impact on the self-confidence of people and thus perpetuate marginalization, low educational attainment, and poverty. The opposite is however also true: Positive identities – on an individual as well as on a collective level – enable people to activate their accessible assets or even gain access to new resources and to thereby strengthen their livelihoods.

In order to benefit fully from the newly gained scope of action for redefining identities, it is however crucial to prevent that new stereotypes are created that counter the old ones: BECK and MIJESKI note that there is a certain risk of indigenous organizations taking "the place of the state in ascribing appropriate identities, values, and actions to indigenous peoples, allegedly in the interest of these groups" (BECK and MIJESKI 2000, p. 122).

In the Yacuambi Valley of Southern Ecuador, I recognize the willingness and ability of people of different ethnic affiliation to face each other with the required openness and good will that, in spite of still prevailing prejudices and stereotypes, could prepare the ground for more equality: As one *mestizo* interview partner put it:

"Pensamos en que todos aquí en el cantón somos iguales. Porque para mi no le veo que es diferencia de que uno lleve pantalón largo y el otro lleve pantalón corto."<sup>17</sup>  
(PD 09: 41).

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17 "We think that all people in the *cantón* are equal. Because I don't see a difference whether someone wears long pants and the other wears short pants [the traditional dress of the male Saraguro]."

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<sup>18</sup> PD = Primary Document in a Hermeneutic Unit of ATLAS.ti™ with serial number. Date of interview. Location of interview. Specifications of interview partner (sex; declaration of ethnic affiliation).



**Sustainable Development, Governance of Resources and Resource Conflicts**



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## **Potentials for Reforestation and Forest Conservation under CDM and REDD+ in the Atlantic Forest of Rio de Janeiro, Brazil**

Udo Nehren (Cologne/Leipzig), Toa Loaiza Lange (Cologne/Göttingen),  
Sandra Alfonso (Cologne/Innsbruck), Friederike Naegeli (Leipzig),  
Joyce Monteiro (Rio de Janeiro), Sabine Schlüter (Cologne)

### **Abstract**

With the Federal Law N° 12.187/09 Brazil created the legal framework to regulate its National Climate Change Policy. Article 12 of the document defines the target to reduce the country's greenhouse gas (GHG) emissions of 36.1 to 38.9% until 2020. To achieve this goal, forest conservation, forest management, and reforestation play an important role, as maintaining existing and creating new carbon pools is a cost-effective way to reduce GHG emissions. Although the forest related action plans in Brazil currently focus on the Amazon and Cerrado biomes, there is also a high potential for forest conservation and reforestation in Brazil's second largest forest area and biodiversity hotspot: the Atlantic Forest (Mata Atlântica).

In this article we discuss the opportunities and barriers for implementing reforestation projects under CDM (Clean Development Mechanism) and REDD+ (Reduction from Deforestation and Forest Degradation) in the Atlantic Forest of Rio de Janeiro, based on studies in the municipality of Cachoeiras de Macacu. The research was carried out in the German-Brazilian DINARIO/MP2 project from 2008 to 2011. We conclude that there is a high reforestation potential particularly on pasture land, which is often degraded due to overexploitation. However, implementing reforestation projects under CDM is difficult due to small-scale land tenure, high transaction costs, and the difficulty to prove additionality. We assume that REDD+ could be promising as the mechanism also considers the aspects of sustainable forest management, biodiversity conservation, and participation of smallholders. However, a binding legal framework and methodology for REDD+ has not yet been developed. Therefore, one of the main challenges is to establish a national REDD+ regime, which brings together the targets of climate change mitigation and nature conservation.

## **1 Introduction**

Deforestation and forest degradation are responsible for approximately 12 to 20% of global green house gas (GHG) emissions and are thus the second largest anthropogenic source of CO<sub>2</sub> in the atmosphere only surpassed by fossil fuel combustion (IPCC 2007; VAN DER WERF et al. 2009). Therefore, forest conservation and reforestation play an important role in the discussion of climate change mitigation as a cost-efficient strategy to reduce GHG emissions through maintaining existing, restoring lost and creating new carbon pools (STERN report 2006; IPCC 2007; ROBLEDO and BLASER 2009).

Tropical forest ecosystems have been identified as particularly important due to their high carbon stocks and carbon sequestration potentials on the one hand, and globally high deforestation rates and extended areas under increasing land use pressure on the other hand (AMTHOR et al. 1998; IPCC 2007; RUESCH and GIBBS 2008; FAO 2010). According to the STERN report (2006), deforestation is responsible for an estimated release of 5.8 billion tons of CO<sub>2</sub> equivalents each year, of which 96% are emitted by developing countries of the tropics (IPCC 2007). Reducing these emissions and creating new carbon pools through reforestation would significantly contribute to keeping atmospheric CO<sub>2</sub> concentrations under the critical level of 450 ppm and stabilizing global temperatures at a maximum 2°C increase, as stated in the IPPC Fourth Assessment Report (2007) and incorporated in the Copenhagen Accord COP 15 (UNFCCC 2009a).

Consequently, forest management and reforestation were on the agenda of the international climate policy. They were already included in the Kyoto Protocol (United Nations 1998) in the context of LULUCF (land use, land use change, forestry) under the Clean Development Mechanism (CDM). Article 12 of the Kyoto Protocol (1997) defines a CDM to assist industrialized and emerging countries (Annex I countries) in achieving their GHG emission limitation or reduction commitments under Article 3 of the Protocol and to support developing countries (non-Annex I countries) in achieving sustainable development. The mechanism is based on the implementation of emission-reduction projects in developing countries, which can earn tradable certified emission reduction (CER) credits. The CDM allows for projects which contribute to a removal of GHG from the atmosphere and its storage in terrestrial ecosystems. However, LULUCF projects are limited to afforestation and reforestation (A/R) according to the definition of the Marrakesh Accords (UNFCCC 2001), and do not include forest conservation and management projects. They are considerably under-represented compared to other types of CDM projects. Currently A/R projects represent less than 1% of all CDM projects worldwide (UNFCCC 2011a).

At the UNFCCC 11<sup>th</sup> conference of the parties in Montreal, 2005 (COP 11 and CMP 1), the “Coalition for Rainforest Nations” requested the agenda item “Reducing emissions from deforestation in developing countries: approaches to stimulate action“, which di-

rected the attention to the high deforestation rates in developing countries and called for scientific, technical, and political action. Since then, policies related to deforestation and forest degradation, which had been excluded from the Kyoto Protocol due to difficult measurements and monitoring, were back on the political agenda. In 2007, at the UNFCCC 13<sup>th</sup> conference of the parties in Bali (COP 13 and CMP 3), Reduction from Deforestation and Forest Degradation (REDD) became formal in the Bali Action Plan (Decision -/CP.13). REDD directly aims at forest conservation, sustainable forest management and the enhancement of carbon stocks. Considering these aspects of nature conservation, REDD goes far beyond A/R projects under CDM.

In the REDD discussions at the UNFCCC climate talks in Bonn in June 2009, more attention was given to the participation of local communities and indigenous peoples in the management of tropical forests as well as enhancing existing forests and increasing the forest cover through reforestation. This strategy is defined in point 6 of the Copenhagen Accord (Draft decision -/CP.15):

“We recognize the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD+, to enable the mobilization of financial resources from developed countries.” (UNFCCC 2009b).

The mobilization of financial resources for initiatives – now under REDD+ – was an important result of the UNFCCC 15<sup>th</sup> conference of the parties in Copenhagen in 2009 (COP 15 and CMP 5), and one year later at the UNFCCC 16<sup>th</sup> conference of the parties in Cancún (COP 16 and CMP 6), where the Cancún Agreements (Decision 1/CP.16) provided countries with guidance on REDD+ readiness (Figure 1).

The tropical forests of Brazil play a central role in the REDD+ process, as Brazil is the tropical country with the largest forest area (520 million ha, FAO 2010, p. 47), and deforestation and forest degradation accounted for approximately 57.5% of Brazil’s national CO<sub>2</sub> emissions in the year 2005 (Federal Republic of Brazil, Ministry of Environment 2009). Against this background, in 2007 the Brazilian government launched the National Plan in Climate Change (PNMC) which includes under point 4 the objective to “seek for sustained reduction deforestation rates, in all Brazilian biomes, in order to reach zero illegal deforestation”, and under point 5 the objective to “eliminate the net loss of forest coverage in Brazil by 2015” (Interministerial Committee on Climate Change, Government of Brazil, 2008).

In 2009, at the 15<sup>th</sup> Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change (UNFCCC) and the 5<sup>th</sup> Meeting of the Parties (MOP 5) to the Kyoto Protocol in Copenhagen, the Brazilian delegation announced the decision

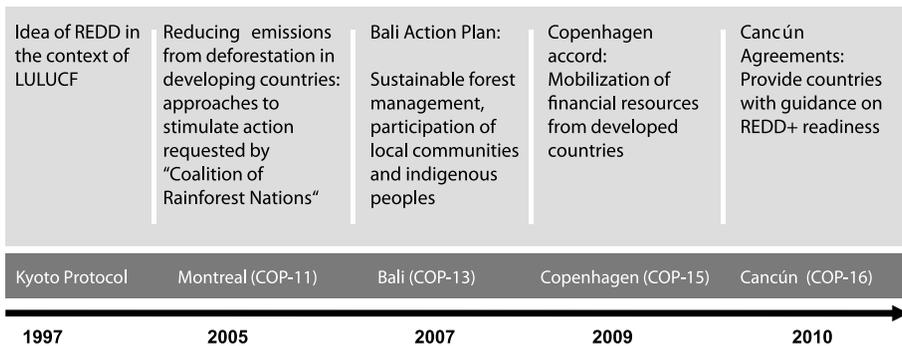


Figure 1: The milestones of the REDD/REDD+ process

Source: Own compilation

to reduce the national domestic GHG emissions 36.1-38.9% below business-as-usual (BAU) by 2020. These emissions reduction targets are part of Brazil's "National Appropriate Mitigation Action (NAMA)", which has been anchored in the National Policy for Climate Change (NPCC), Federal Law N° 12.187/09.

According to Article 5 of the Brazilian Presidential decree N° 7.390/10, land use changes have the highest GHG reduction potential with 1,404 million t CO<sub>2</sub>e until 2020, followed by the energy sector (868 million t CO<sub>2</sub>e), the agriculture sector (730 million t CO<sub>2</sub>e), and the industrial processes and waste sector (234 million t CO<sub>2</sub>e). Therefore, forest conservation, forest management, and reforestation have been pointed out as particularly important to achieve the reduction target. By the end of 2011, twelve sectoral plans with reduction targets for 2020 shall be implemented. Two plans focus on the reduction of deforestation rates in the Amazon and Cerrado biome, with reduction targets of 80% and 40%, respectively. With respect to agricultural land use and forestry, six targets have been defined:

- the recovery of 15 million hectares of lands degraded by cattle farming,
- expanding the integrated farming, forestry and cattle raising by 4 million hectares,
- expanding direct seeding by 8 million hectares,
- expanding biological nitrogen fixation by 5.5 million hectares,
- expanding forests by 3 million hectares, and
- using new technologies to produce additional animal manure of 4.4 million cubic meters.

The other sectoral plans are related to the energy and steel sector (Portal Brasil 2011).

Although forest and land use related action is strongly focused on the Amazon and Cerrado biome, several studies assume that there is also a high potential for forest conservation

and reforestation projects in the other biomes, in particular in the Atlantic Forest (SPVS 2009). The Atlantic Forest (Portuguese: Mata Atlântica), one of the main biomes in South America, extends from Ceará in Northeast Brazil to the southern state of Rio Grande do Sul and further inland to Paraguay and Northeast Argentina. The potential natural forest area is estimated at 1.0 to 1.5 million km<sup>2</sup> (GALINDO LEAL and DE GUSMÃO-CÂMARA 2003; Fundação SOS Mata Atlântica and INPE 2009), but only a small percentage of the former forest now remains as a consequence of historical deforestation and degradation processes (NEHREN 2008). Due to different research methodologies, this percentage is estimated at 5.0-9.0% (FONSECA 1985; RANTA et al. 1998; MORELLATO and HADDAD 2000; OLIVEIRA-FILHO and FONTES 2000), or 11.4-16% (RIBEIRO et al. 2009), respectively. Despite its historical destruction and fragmentation, the Atlantic Forest contains forest remnants with a very high level of species diversity and endemism. The outstanding biological diversity and the ongoing anthropogenic pressures on the forests are the reasons for considering the Atlantic Forest as one of 25 hotspots of biodiversity worldwide (MYERS et al. 2000), and number five of the most threatened biodiversity hotspots (Conservation International 2011).

With the “Lei da Mata Atlântica”, Federal Law N° 11428/06, and in accordance with the National Forest Code, Federal Law N° 4771/65, the Brazilian government defined objectives and principles for the conservation, protection, and restoration of the Mata Atlântica biome. Against this background, we raise the question how the principles of nature conservation go together with the national climate change mitigation strategies. In this context we focus on the potentials for CDM and REDD+ projects for climate change mitigation and nature conservation. Our studies were carried out in the municipality of Cachoeiras de Macacu, northeast of Rio de Janeiro city. In the following sections we give an overview of forest projects in the international carbon market (2), the CDM and REDD/REDD+ environment in Brazil (3), and the study area (4), before we present and discuss our results (5) and come to the conclusion and outlook (6).

## **2 The role of CDM and REDD+ projects in the international carbon market**

Carbon markets have become an increasingly important instrument for GHG mitigation, and one of the fastest growing markets in the world. On July 6, 2007, the New York Times ran an article titled “In London’s Financial World, Carbon Trading Is the New Big Thing”, and Louis Redshaw, head of environmental markets at Barclays Capital, made the optimistic prediction that “Carbon will be the world’s biggest commodity market, and it could become the world’s biggest market over all.” At the time this statement was made, the total value of the carbon market was estimated at USD 31.2 billion. Until 2009 the market grew rapidly to reach USD 143.7 billion in 2009, but in 2010 the market slightly shrank to USD 141.9 billion (The World Bank 2011).

In 2010, the international carbon market was dominated more than ever by the European Union Emission Trading Scheme (EU ETS) allowances, which accounted for 84% of the total market value. Together with secondary CDM transactions – this term refers to CERs that are resold from a marketplace – the share rose to 97% (The World Bank 2011). However, compared to the robust absolute growth in previous years, the European carbon market cooled down with a slight growth of only 1.0 percent from 2009 to 2010. At the same time, the values of other allowances, such as the U.S. Regional Greenhouse Gas Initiative (RGGI), as well as primary CDM decreased significantly, resulting in a stagnation of the international carbon market (The World Bank 2011).

Within the global carbon market, forestry projects only play minor roles, measured by market share and economic benchmarks. The EU ETS did not even include the forest sector when it was launched in 2005 as a major instrument of the EU climate policy (Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, Annex I, The European Parliament and the Council of the European Union 2003). Although the second trading period (2008-2012) after the pilot phase (2005-2007) introduced CDM and Joint implementation (JI) credits on the legal basis of the EU's "Linking Directive" (Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004), LULUCF activities were explicitly excluded. The main argument against considering forest activities were the risks of forest fires and diseases that could destroy vegetation and release the stored carbon (HYVÄRINEN 2011).

Finally, Article 26 of the Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 provided the legal basis for implementing LULUCF activities in the EU ETS:

"The Union should work to establish an internationally recognised system for reducing deforestation and increasing afforestation and reforestation, supporting the objective, within the UNFCCC, of developing financing mechanisms, taking into account existing arrangements, as part of an effective, efficient, equitable and coherent financial architecture within the international agreement on climate change to be reached in the Copenhagen Conference on Climate Change (COP 15 and COP/MOP 5)."

However, it may take some time and effort to integrate forest-based credits in the third trading period (2012-2020).

At present, the market for forest conservation and reforestation projects provides different mechanisms outside the EU ETS, namely A/R under CDM, REDD+, and other voluntary markets. The CDM, defined in Article 12 of the Kyoto Protocol, has two main objectives: to support industrialized countries to meet their GHG reduction targets under the Kyoto Protocol and at the same time to stimulate sustainable development in developing countries. The central element of this flexible and project based mechanism is a trade of

Certified Emission Reductions (CERs), commonly known as carbon credits. The CDM includes 15 sectoral types of emission-reduction projects, of which energy industry projects play by far the most important role with currently 67% of all projects (UNFCCC 2011a). Forestry projects under CDM are limited to afforestation and reforestation, but do not include conservation and management activities. Currently the CERs under Kyoto only account for 1-2% of all certificates, and afforestation and reforestation projects represent less than 1% of all CDM projects (see section 1). The main reasons for the low acceptance must be seen in the difficult procedure and high implementation costs. Moreover, the lack of post-2012 regulatory clarity led to a rapid decline of the primary CDM market value from 7.4 billion US\$ in 2007 to 1.5 billion US\$ in 2010 (The World Bank 2011).

REDD+ comprises five main types of activities:

- reducing emissions from deforestation,
- reducing emissions from forest degradation,
- forest conservation,
- sustainable management of forests, and
- enhancement of forest carbon stocks (The World Bank 2011).

In contrast to A/R projects under CDM, the REDD+ mechanism has no clear methodologies and still controversially discussed in Post-Kyoto meetings. Despite this, the Copenhagen Accord (COP 15, UNFCCC 2009a) underlines its significance and the Cancun Agreements (COP 16, UNFCCC 2010) include an agreement on REDD+, which provides more details and guidance for the target countries. In the near future, the Subsidiary Body on Scientific and Technological Advice (SBSTA) is expected to give further advice concerning reference emission levels as well as measurement, reporting, and verification systems (MRV).

Another open question is the funding mechanism for REDD+. For Phase I (development of national REDD strategies and capacity building), and Phase II (implementation of strategies and demonstration activities) finances are available through public and private funds, bilateral grants and multinational assistance, such as UN-REDD, the Forest Carbon Partnership Facility (FCPF), the REDD+ Partnership, or Norway's International Climate and Forest Initiative. For Phase III, the development of result-based activities that are measured, reported, and verified, the type of financial support is still left open (The World Bank 2011).

Nevertheless, in 2010 the numerous smaller REDD+ projects that had been developed by private and public entities had a market share of 29% of the voluntary over-the counter (OTC) market (Ecosystem Marketplace and Bloomberg New Energy Finance 2011). Of various standards for accounting for GHG emission reductions, the Verified Carbon Stan-

dard (VCS) evolved as the most important one. However, although the voluntary carbon market grew in 2010, its fraction is still very small with only a volume of 0.02 and a value of <0.01 of the total global carbon market (Ecosystem Marketplace and Bloomberg New Energy Finance 2011). With respect to the future development of REDD+, UNFCCC and EU ETS are potential candidates for its integration in the international post-2012 carbon market, but also California's cap-and-trade system, which is expected to become operational in 2012 (The World Bank 2011).

### **3 The CDM and REDD+ environment in Brazil**

Worldwide, Brazil is number three in expected average annual CERs from registered CDM projects (UNFCCC 2011a). However, the country's market share is only 4.5% of the total average annual reductions, as China holds by far the largest share of 63.7% and India another 10.7%. As of 1 Sept 2011, Brazil hosts 228 CDM projects, of which only two are A/R projects. In contrast, 133 projects are in the energy industry sector and another 84 projects in the waste handling and disposal sector. These figures illustrate that Brazil has a good climate and overall capacity for CDM projects, but it also shows that the A/R sector is clearly underrepresented. The very small proportion of A/R projects is not a country specific characteristic, but a general phenomenon, as already mentioned before.

Brazil can be designated as the world leader in developing a REDD+ framework, although the country is neither a member of the UN-REDD nor the FCPF program. However, Brazil recently became a pilot country under the Forest Investment Program (FIP) of the World Bank. In 2008, Brazil was the first country in the world that implemented a national voluntary mechanism to reduce deforestation rates, the Amazon Fund (Fundo Amazônia; Amazon Fund 2012). The Amazon Fund was created by presidential decree on 1 August 2008 and receives USD 1 billion from the Norwegian government over the 2009-2015 time period and further donations from Germany. The fund currently supports 17 projects related to forest management, nature conservation and in particular the reduction of deforestation in the Amazon. Another 15 projects are submitted and 26 projects are under analysis (date 1 Sept 2011).

In December 2009, the Brazilian government presented the national REDD strategy at the 15<sup>th</sup> UNFCCC Conference of the Parties in Copenhagen (Federal Republic of Brazil, Ministry of Environment 2009). The key points are the voluntary target of an 80% deforestation reduction in the Brazilian Amazon and the statement to use the Amazon Fund to finance REDD activities in the Amazon. Already three years before, the Public Forest Management Act (Federal Law N° 11.284/06) had been established to regulate the access and exploitation of public forests.

Up to now, Brazil does not yet have a national legal framework to regulate REDD+ activities. However, already in 2010 the Law project N° 5586/09 (Projeto de Lei 5586/09) aimed at the establishment of a national system of reducing emissions from deforestation and forest degradation, conservation, sustainable forest management, maintenance and increase of levels of forest carbon stocks (REDD +), and other measures. Recently the bill was reintroduced as Law Project N° 195/11. Also in 2010, working groups were created to discuss the main elements of a national REDD strategy with participation of governmental and non-governmental institutions (The REDD desk 2011).

Figure 2 gives an overview of the legal REDD environment in Brazil, without claim to completeness. It outlines the four decision levels of the REDD/REDD+ process: international, national, subnational, and project levels. With respect to the national level, it shows that a national REDD+ system has not yet been established (Law projects N° 5586/09 and N° 195/11), and moreover, that several other laws are directly related to REDD. Some of them, namely the National Plan on Climate Change, the National Policy for Climate Change, the Public Forest Management Act, and the Lei Mata Atlântica (with respect to the Atlantic Forest) have already been mentioned. Also of particular importance are the other laws shown in the figure: the National Plan for Deforestation, the National System of Protected Areas, the National Water Resources Policy, the Definition of the National

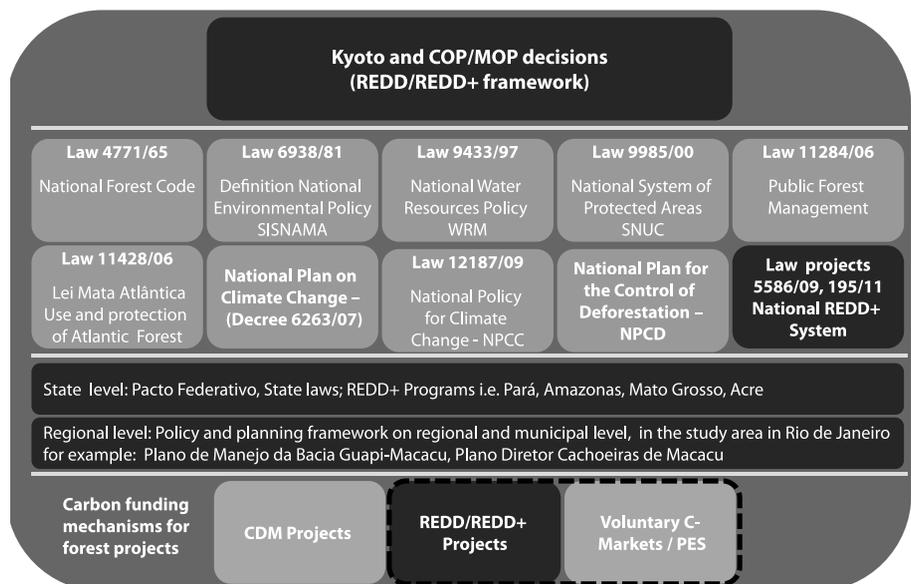


Figure 2: The legal CDM and REDD/REDD+ environment in Brazil with special consideration of the Atlantic Forest of Rio de Janeiro

Source: NEHREN, LOAIZA LANGE and ALFONSO 2011, modified

Environmental Policy, and the National Forest Code. The National Forest Code, as the oldest of the REDD related laws, is currently under revision and not yet ratified.

At the subnational level, some federal states of the Amazon have already established REDD+ legal and institutional frameworks. This applies for the states of Amazonas, Pará, Mato Grosso, and Acre. Additionally, five of the nine Amazon states participate in the Governors' Climate and Forests Task Force, which supports states in developing subnational systems. Outside the Amazon, no federal state has yet implemented a REDD+ framework. Apart from this need, the main challenge on the subnational level will be to bring REDD+ to the municipalities, in particular to foster public participation, clarify land ownership and ownership rights, and integrate REDD+ in the regional planning processes. Moreover, indigenous rights must also be considered in the Amazon. Currently REDD+ consists of numerous isolated projects that are mainly located in the Amazon and funded by different donors. Therefore, the key challenge for the whole REDD+ process is to integrate REDD+ projects and subnational programs in a national system, and link this system to the international carbon market.

Equivalent to the formal mitigation strategies, other mechanisms like Voluntary Carbon Markets (VCM) and Payments for Ecosystem Services (PES) are also available in the carbon markets for developing forestry and reforestation projects. These frameworks are especially common in forestry projects where flexibility, replicability and higher social and environmental standards account for their recognition. At present there are more than 100 initiatives merely in the Atlantic Forests that promote forest restoration, protection or carbon stocks enhancement (MAY 2011). In 2011, the extensive document "Pagamento por Serviços Ambientais na Mata Atlântica – Lições aprendidas e desafios" was published by the Brazilian Ministry of Environment and other institutions (Ministério do Meio Ambiente et al. 2011). It gives a comprehensive overview of the Payment for Ecosystem approach and the ongoing initiatives in the Atlantic Forest.

#### **4 The study area in the Atlantic Forest of Rio de Janeiro**

Within the Mata Atlântica biome, the "Serra do Mar" biogeographic corridor represents relatively extensive remnants of the Atlantic Forest in the states of Rio de Janeiro and São Paulo as well as smaller patches in Minas Gerais and Northern Paraná (Figure 3). These forests stretch along the Serra do Mar mountain range, which extends over about 1,000 km from Santa Catarina in the South to Rio de Janeiro in the North. Historical deforestation and forest fragmentation within the last 500 years resulted in a transformation from a natural to a cultural landscape that is dominated by pastures and agricultural land dotted with numerous small forest patches today. However, due to the steepness of the Serra do Mar and its difficult access and usability, larger rainforests remained in the Serra do Mar mountain range and also in part of the coastal mountains and islands.

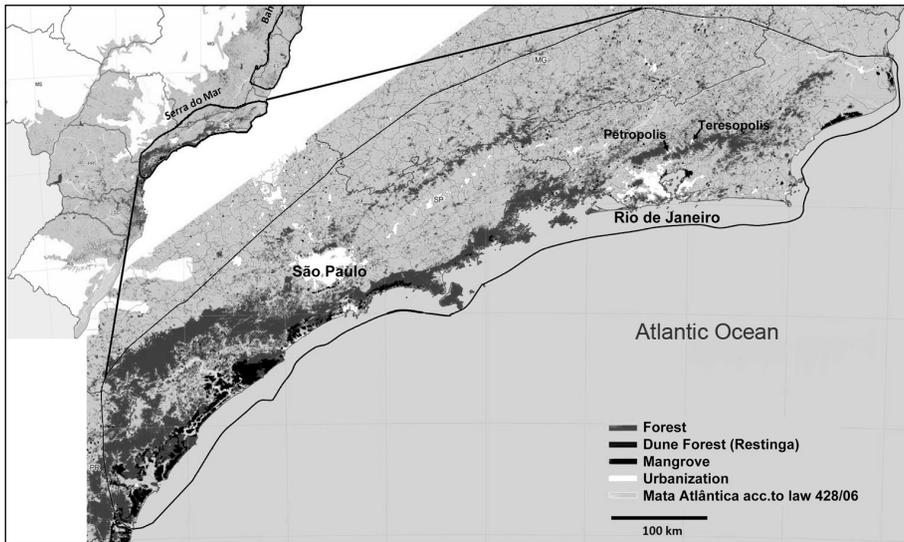


Figure 3: Forest patches in the biogeographic corridor of the Serra do Mar  
 Source: Fundação Mata Atlântica 2009, modified by SATTLER

As an integral part of the research project DINARIO, funded by the German Ministry of Research and Education (BMBF), and the Brazilian partner project MP2 (EMBRAPA Solos, Rio de Janeiro), we investigated the potentials for the implementation of CDM and REDD+ in the municipality of Cachoeiras de Macacu. Figure 4 shows the DINARIO project area with the municipalities of Petrópolis, Teresópolis, Nova Friburgo, Bom Jardim, Guapimirim, and Cachoeiras de Macacu, located northeast of Rio de Janeiro city and representing the northernmost branch of the “Serra do Mar” mountain range. The whole project area covers 4,200 km<sup>2</sup>.

According to NEHREN (2008), the study area can be geographically divided in three main units:

- the central mountain range of the Serra do Mar (in this section named “Serra dos Órgãos”) with extended rainforests,
- the highly fragmented foothills and coastal zone in the municipalities of Guapimirim and Cachoeiras de Macacu where pastures and agricultural land predominate, and
- the mountainous hinterland of Petrópolis, Teresópolis, Nova Friburgo, and Bom Jardim with a mosaic of pasture lands, plantations, agricultural land with a high proportion of vegetable cultivation, and forest fragments of different sizes and shapes.

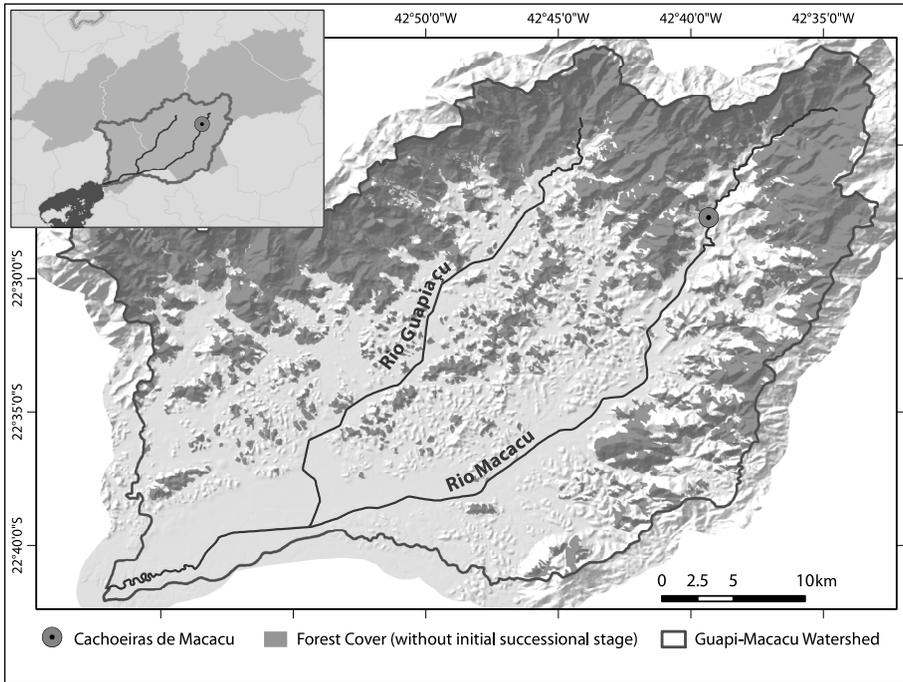


Figure 4: Study area of the DINARIO project (left) with the Guapi-Macacu Watershed  
 Source: EMBRAPA Solos; DINARIO; Cartographic Elaboration by Naegeli 2011

The rainforests of the central mountain ranges are part of a conservation corridor with the National Park “Serra dos Órgãos” and the State Park “Três Picos” as central conservation units (Figure 5). Outside the conservation units, the Lei Mata Atlântica is the legal basis for the protection of forest fragments. According to the remote sensing based forest monitoring of Fundação SOS Mata Atlântica and INPE (2008, 2009, 2010), the deforestation rate in the state of Rio de Janeiro was moderate between 2000 and 2010, with deforestation rates of 0.07% in the 2000-2005 period, 0.13% in the 2005-2008 period, and 0.04% in the 2008-2010 period. The absolute forest loss in that time period was around 2,000 hectares. Table 1 shows the original forest cover, the forest cover in the year 2010, and the forest losses for the 2005-2008 and 2008-2010 periods in the six municipalities of the DINARIO/MP2 project. The Table states that the forest cover changes in that time period were moderate in the study area, too.

The municipality of Cachoeiras de Macacu covers the largest part of the Guapi-Macacu watershed and contains an above-average proportion of rainforest area. These forests are mainly submontane and montane rainforests of altitudes between 100-200 and 2,000 m a.s.l. In contrast, the lowlands are dominated by pastures and agricultural land, and



Figure 5: Rainforest of the National Park “Serra dos Órgãos” (left) and forest fragments on half oranges in the agricultural landscape of Cachoeiras de Macacu (right)

Source: Photos by Nehren

forests are limited to small fragments mainly located on cone-shaped hills called “meias laranjas” or “half oranges” (Figure 5). Towards the alluvial coastal plain these hills are less frequent and the proportion of forested land considerably lowers. In the flatlands, where the river beds of the Macacu and its main affluents are channelized, the dominance of pastures diminishes in favor of agricultural land.

NAEGELI (2010) studied small-scale losses and gains for the period 2003-2010 in the upper Guapi-Macacu watershed in the municipality of Cachoeiras de Macacu based on high-resolution SPOT 5 images. Forest losses in the upper Guapi-Macacu watershed are predominately located in the agricultural landscape of the lowlands, caused by small-

Table 1: Original forest cover, forest cover 2010, and forest losses 2005-2008, 2008-2010 in the six municipalities of the DINARIO/MP 2 project

Municipality	Original forest cover in ha*	Forest cover 2010 in ha	Original forest cover in %	Forest loss 2005-2008 in ha	Forest loss 2008-2010 in ha
Bom Jardim	38,589	5,549	14.4	0	0
Cachoeiras de Macacu	95,678	41,394	43.3	5	3
Guapimirim	36,168	9,548	26.4	0	0
Nova Friburgo	93,174	40,602	43.6	21	12
Petrópolis	79,320	24,661	32.0	0	5
Teresópolis	77,057	23,053	26.1	5	3

\* acc. to Lei da Mata Atlântica

Source: Fundação SOS Mata Atlântica and INPE 2009, 2010



*Figure 6: Eroded landscape in the Guapi-Macacu watershed*

*Source: Photo by Nehren*

scale expansion of agricultural land, settlements, and road construction. In contrast, gains are mainly observed in the submontane zone, where former forest gaps closed, due to natural forest succession on abandoned pastures and agricultural fields. These small-scale changes cannot be detected with Landsat 7 imagery used by Fundação SOS Mata Atlântica and INPE for the large scale monitoring of the Mata Atlântica.

The hilly landscape of the lower mountain range in transition to the lowlands is dominated by pastures. In wide parts of this zone, severe erosion damages due to overgrazing can be observed (Figure 6). From a landscape ecological perspective these lands offer great potentials for reforestation, as slopes and river banks would be stabilized, ecological corridors expanded, and climate change mitigation efforts supported. Therefore, CDM, REDD+, and other voluntary markets need to be discussed as possible finance options for reforestation projects.

Of utmost importance for the development of the whole region are the petrochemical complex COMPERJ (<http://www.comperj.com.br>) and the planned motorway ring road “Arco Metropolitano”. COMPERJ, owned by PETROBRAS and other investors, is located in the south of Cachoeiras de Macacu and the northern part of the bordering municipality of Itaboraí. The factory, currently under construction, will be connected to the new motorway ring road. These large projects will have a major impact on the infrastructural development and land use/land cover of the region, and likely cause further landscape fragmentation due to suburbanization processes and increased traffic. On the other hand, compensation measures such as a planned ecological corridor may compensate or at least minimize these negative effects.

## **5 Potential analysis for CDM and REDD+ projects in the study area**

The overall potential analysis for the implementation of A/R projects under CDM in the municipality of Cachoeiras de Macacu was carried out following the “Procedures to demonstrate the eligibility of lands for Afforestation and Reforestation of the Clean Development Mechanism Activities” (IPCC 2001) and according to the definition of forest by the Designated National Authority (DNA) of Brazil (Resolução No. 2, 10/08/05, Art. 3) in the most coherent manner.

In the UNFCCC Decision 16/CMP.1 “Land use, land-use change and forestry“, Annex A, the terms forest, afforestation and reforestation are defined as follows (UNFCCC 2010): Forest refers to “a minimum area of land of 0.05 to 1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10 to 30 per cent with trees with the potential to reach a minimum height of 2 to 5 meters at maturity in situ.” Afforestation is “the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources”. In contrast, reforestation is “the direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human-induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land.” Eligible lands for reforestation should not contain forest on 31 December 1989.

Potential areas for reforestation in the municipality of Cachoeiras de Macacu have been identified by comparing a land cover map obtained from satellite images of 1985 (Landsat 5 TM 217/75; Landsat 5 TM 217/76) (LOAIZA LANGE 2010) with the most recent available land use map for 2007 (COPPETEC 2009) through a top-down regional baseline approach (SUDHA et al. 2007; HARGRAVE et al. 1998) using ArcGIS 9.0. Suitable areas for afforestation could not be considered, because satellite images, aerial views, or land use/land cover maps for the 1960s were not available.

The 1985 LANDSAT images were georeferenced and reprojected. The geometric rectification was done in ENVI 4.3 using ground control points. The land cover classification was processed in Definiens Developer EII Earth (Nearest Neighbour algorithm, bands 1-5 and 7). Methodological problems occurred due to the identification of forests types in the 1985 LANDSAT images, as the boundaries between forest and non-forest (young successional stages, bushland) could not always be clearly identified. Moreover, small losses or gains at the forest edges could not be detected due to the 30 m resolution of the LANDSAT images. Finally, satellite images with an acceptable cloud cover were only available for 1985, but not for 1989. Therefore the 1985 images had to be used.

As a result, about 232 km<sup>2</sup> (27%) of the total municipal area are eligible lands for reforestation projects under CDM (Fig. 7), with about 194 km<sup>2</sup> of pastures, 36 km<sup>2</sup> of agricultural land, and 2 km<sup>2</sup> of exposed soils. The upper watershed has very low potential, because only small land use/land cover changes occurred between 1985 and 2007. Moreover, the upper watershed includes several conservation units, which do not fulfill the requirement of additionality. Other areas have already been reforested or naturally regenerated since 1985.

In contrast, there is a higher potential for A/R projects in the central watershed, particularly along the Macacu and Guapiaçu rivers. However, according to the National Forest Code, Permanent Preservation Areas (APPs) and Legal Reserve Forest Areas (RLFs) include the protection of riverine forests. Therefore any kind of A/R project that will be implemented in these protected areas will also face the difficulty to demonstrate its additionality. Another obstacle for the implementation of A/R projects is that the historically deforested lands of the central and lower watershed are highly parceled and disper-

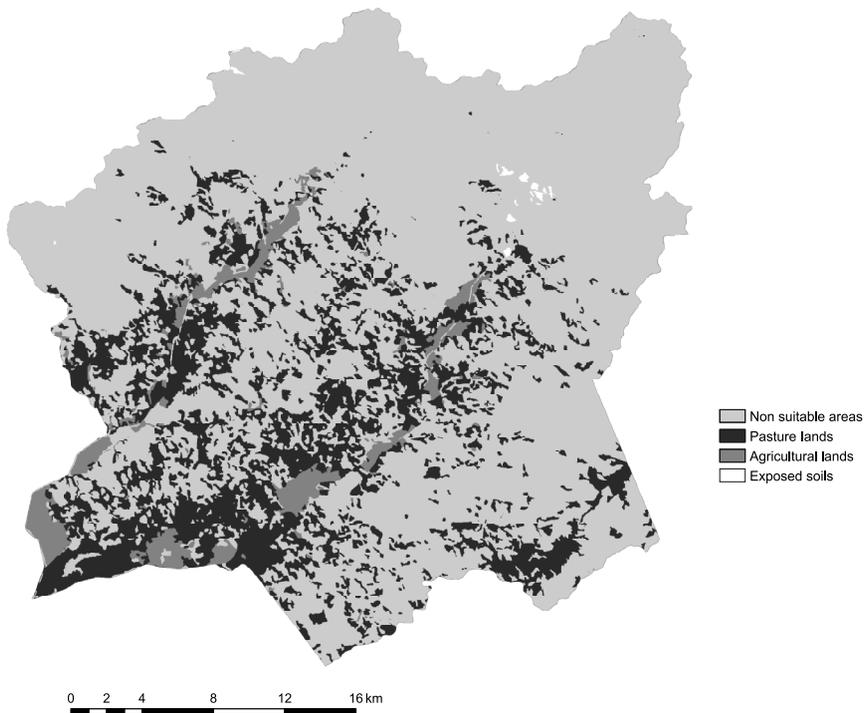


Figure 7: Eligible lands for reforestation under CDM in the municipality of Cachoeiras de Macacu (pasture lands, agricultural lands, and exposed soils)

Source: LOAIZA LANGE 2010, p. 53.

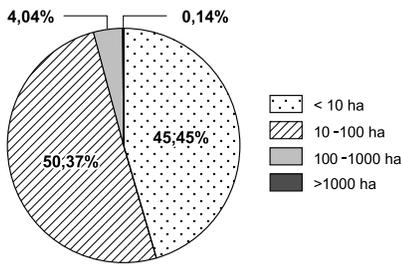


Figure 8: Farm sizes in the municipality of Cachoeiras de Macacu 2006  
 Source: IBGE 2009

sed, with only 4.04% of farm sizes > 100 ha and 0.14% > 1,000 ha (Figure 8). According to MAY (2011, p. 68), the minimum recommended area for carbon sequestration plantations in the Mata Atlântica should be 1,000 ha, otherwise transaction and labor costs will be too high. Low seedling survival rates and difficulties in controlling introduced grasses (particularly *Braccharia* sp.) in pasture lands may increase costs as well. Finally, the agricultural land of the central watershed is highly productive and important for the local market

of agricultural products. Therefore, suitable areas for A/R projects are restricted to pastures. However, the landscape mosaic with protected forest fragments and productive agricultural land in the floodplains as well as the dispersed property structure make it difficult to implement an A/R project.

Other important barriers for the implementation of A/R projects are the high transaction costs during the formulation and implementation of the project, including the need of trained experts for geoprocessing activities, carbon pool measurements and monitoring. In the same way, market fluctuations and temporality of carbon credits from forestry projects are major concerns. Apart from these structural difficulties, LULUCF projects are widely unknown among farmers and local authorities in the project area (Table 2).

With respect to REDD+, this paper focuses on the potentials for reforestation to enhance carbon stocks as one of the five main types of activities (compare section 2). These reforestation activities should go together with the sustainable management of the remaining forest fragments, reducing their degradation, and integrate them in larger reforestation areas. The REDD+ activities “reducing emissions from deforestation” and “forest conservation” are less important in the study area, as (a) the deforestation rates are rather low, (b) the extended rainforests in the Serra do Mar mountain range are already part of an existing network of protected areas, and (c) the smaller forest fragments and riverine forests in the agricultural landscapes are protected by the Mata Atlântica law and the National Forest Code (compare section 4). However, REDD+ projects in the Amazon, such as the Peruvian project “Carbon Emissions Reduction from Avoided Deforestation for the Protection of the Cordillera Azul National Park”, argue that there can also be additionality in already protected areas, even National Parks. This is the case when the REDD+ project fosters an improved management in and around the National Park (COLINI CENAMO et al. 2009, p. 54). With the same argument, REDD+ could create financial incentives to restore and manage Permanent Preservation Areas (APPs) and Legal Reserve Forest Areas (RLFs), although these areas are already protected (Table 3).

Table 2: Main characteristics of A/R projects under CDM and forestry projects under REDD+ with special consideration of Brazil and the Atlantic Forest

	<b>A/R projects under CDM</b>	<b>REDD+</b>
<b>Mechanism</b>	Established under the UN Framework Convention on Climate Change	Not yet established; legal framework to institutionalize REDD+ in Brazil currently under discussion (law projects No. 5586/09 and 195/11)
<b>Methodology</b>	Already 11 approved methodologies for large-scale and 7 for small-scale A/R CDM project activities	Standard methodologies not yet developed
<b>Main criteria for establishment of projects</b>	Eligibility of land (31/12/1989 rule), baseline scenarios, carbon pools accounting, additionality demonstration, leakage mitigation, stakeholder consultation	Not yet defined
<b>Modalities/Types of projects</b>	Afforestation and reforestation	Reducing emissions from deforestation and forest degradation through forest conservation, sustainable forest management, reforestation
<b>Goals</b>	Climate change mitigation and sustainable development for the host country	Climate change mitigation and other benefits: nature conservation, water and soil protection, improving living conditions of local communities and indigenous peoples
<b>Number of projects: International and Brazil</b>	Dated 01/09/2011: 31 Registered A/R projects worldwide, two large scale projects in Brazil (UNFCCC 2011a )	Numerous projects worldwide; in Brazil several projects under different funding sources, the majority in the Amazon; three projects in the Atlantic Forest by “Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental (SPVS)” (date 1 Sept 2011)
<b>Carbon trade mechanism</b>	Certified emission reductions (CERs)	Several project already under voluntary markets: VERs and others
<b>Investors</b>	Mainly private investors	National or local governments, NGOs, private investors, or a combination of these

<b>Implementation barriers</b>	Difficult to prove additionality High transaction costs and market fluctuations Geoprocessing requires trained experts, costly software and actual land cover data Difficult to find eligible lands in fragmented landscapes Large areas needed	Information, participation and organization barriers: capacity building to improve REDD knowledge needed; participation and benefit sharing mechanisms not clear; social and environmental safeguards missing; institutional structure not yet developed Economic barriers: structure of funding mechanism not yet developed Scientific barriers: lack of MRV (monitoring, reporting, and verification) system and appropriate baseline and reference emissions scenarios Legal barriers: REDD legal framework not yet operational; unclear land and carbon credit rights
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Source: Own compilation

Some of the barriers for the implementation of A/R projects under CDM also apply for reforestation under REDD+, in particular to find sufficiently large areas of at least 1,000 ha within the fragmented landscape mosaic. Particularly in the central watershed, the dispersed property structure and unclear land tenure are barriers for reforestation projects. Moreover, the alluvial plains and floodplains are agricultural lands of high value and productivity. These areas are used by small farmers to provide the local markets with agricultural products. Hence, potentials for carbon stock enhancement are limited to the expansion of agroforestry systems in hilly areas and the restoration of riverine forests. To solve the problem of small properties, farmers could be encouraged to establish cooperatives for reforestation projects.

Based on suggested criteria for the selection of suitable lands for reforestation under REDD+ (Table 3), the potentials in the municipality of Cachoeiras de Macacu are highest in the pasture lands of the upper watershed. From the perspectives of landscape integration, biodiversity conservation, and land use structure, the often degraded pasture lands with small forest fragments could be (partly) reforested and integrated in the existing conservation corridor along the Serra do Mar. Even if the forest cover in the municipality of Cachoeiras de Macacu is comparatively high (Table 1), there is a potential for reforestation and forest conservation. In other municipalities with lower forest cover, this potential may be even higher.

Table 3: Suggested criteria for the selection of suitable areas for reforestation under REDD+ in the fragmented landscapes of the Atlantic Forest (Mata Atlântica)

Category	Criteria
Socio-economic aspects	Cost-opportunity criteria
Landscape integration and biodiversity conservation	Areas should be selected with respect to landscape and forest connectivity, under consideration of habitat networks and protected areas Prioritization of degraded lands for reforestation, in particular pasture lands
Legal aspects	Compliance with all relevant legal regulations and property rights Clarification in how far protected areas can be included in REDD+, especially Permanent Preservation Areas (APPs) and Legal Reserve Forest Areas (RLFs)
Regional and sectoral planning	Harmonization with the regional development goals and sectoral plans (settlement planning, traffic and transport, energy, agriculture, water, etc.)
Land use structure	Consideration of the fragmented landscape matrix: sufficiently large areas for reforestation, highly productive agricultural lands should not be used for reforestation
Public participation	Involvement of communities, farmers, and public authorities in the planning process, encouragement of farmers' cooperatives for reforestation projects

Source: Own compilation

However, for a final statement and the proof of feasibility, detailed studies on property structure, land tenure, and profitability are required. A cost-benefit analysis for reforestation under REDD+ and a comparison to other forms of land use require a clearly defined standard methodology and criteria for the establishment of projects (Table 2). As long as the regulatory and methodological framework does not exist, REDD+ projects cannot prove their economic efficiency. Hence, Table 3 should only be understood as a suggestion for the development of general criteria for a selection of suitable lands for reforestation. These criteria need to be further specified.

In the case of the Guapi-Macacu watershed, forest conservation and reforestation could create several environmental and economic benefits apart from the target of carbon stocks enhancement. This applies particularly for biodiversity conservation, erosion prevention, and the protection of the watershed, which ensures the water supply for the São Gonçalo and Niterói urban populations with more than 2 million inhabitants. These targets cannot be achieved equally with reforestation projects under CDM. Although CDM also provi-

des the opportunity to reforest with native species, the aspects of biodiversity conservation, forest management, and community involvement are not addressed.

For the economically efficient, socially acceptable, scientifically verified, and legally secured implementation of REDD+, several barriers have to be resolved (Table 2). With respect to public participation, capacity building to improve REDD knowledge is required, as well as an involvement of communities, farmers, and public authorities in the planning and implementation process. Some main points of criticism of REDD+ are directed to a lack of transparency, a centralized top-down forest management, as well as unclear benefit sharing and carbon rights. This criticism can only be met by transparent multi-level stakeholder involvement in the REDD+ planning process.

Currently numerous initiatives in the Atlantic Forest promote forest restoration, protection or carbon stocks enhancement under Payment for Ecosystem Services (compare section 3). Apart from carbon stocks enhancement, PES include other environmental services with respect to water quantity and quality, biodiversity and landscape beauty, which can also be combined. At present it is not foreseeable in how far PES initiatives can be integrated in an overarching REDD+ framework. We cannot even issue a final opinion if it is useful to put reforestation and forest conservation initiatives that are currently under PES under the REDD+ umbrella. At this stage, REDD+ is a patchwork of single projects under different funds. Nevertheless, some projects have already created a financial return in form of carbon credits sold on the voluntary carbon market (COLINI CENAMO et al. 2009). It also remains uncertain if carbon credits generated by REDD+ projects will be traded at the international carbon market in the near future.

## **6 Conclusions and outlook**

The municipality of Cachoeiras de Macacu in the Guapi-Macacu watershed, northeast of Rio de Janeiro city, has the potential to implement reforestation and forest conservation projects under REDD+ or Payment for Ecosystem Services. These projects could be beneficial for enhanced carbon storage, and moreover for biodiversity conservation, erosion prevention, and protection of water resources. We assume that areas with a similar landscape matrix in the fragmented Atlantic Forest of Southeast Brazil have comparable potentials. In regions with a lower forest cover, these potentials are probably even higher. However, this assessment only derived from the criteria of landscape integration, biodiversity conservation, land use structure, and possibilities for restoration of degraded land. Other important criteria, in particular property rights, land tenure, and socio-economic impacts need to be analyzed as well. With respect to REDD+, no standard methodologies have been developed so far, so that implementation costs could only be calculated on basis of the reforestation activity itself, without consideration of transaction and monito-

ring costs. Therefore at this stage, it is not possible to prove if a project is economically efficient.

In contrast to REDD+, several methodologies for different types of reforestation projects under CDM have been developed. Based on the “Procedures to demonstrate the eligibility of lands for Afforestation and Reforestation of the Clean Development Mechanism Activities” (IPCC 2001) and according to the definition of forest by the Designated National Authority (DNA) of Brazil (UNFCCC 2011b), this study comes to the conclusion that eligible land under the A/R CMD methodology is only available in the central watershed. However, the implementation of a reforestation project in the central watershed will be difficult, because the productive agricultural land is used by small farmers and moreover, there may be conflicts with infrastructure and settlement development. Reforestation in the upper watershed, where degraded pastures could be reforested, is not possible under CDM, as the requirement of additionality cannot be proved, some areas have been deforested after 31 Dec 1989, and others are already naturally regenerated. Apart from this, the application of A/R methodologies is expensive and difficult. Therefore we conclude that A/R under CDM is not suitable for the region.

Both mechanisms, REDD+ and PES, could be used for reforestation and restoration of degraded pasture land in the upper Guapi-Macacu watershed. In contrast to CDM, these mechanisms not only focus on carbon sequestration, but also on other ecosystem services. In case of PES with respect to the Mata Atlântica (Ministério do Meio Ambiente et al. 2011), these are criteria related to water quantity and quality, biodiversity and landscape beauty including tourism activities. Another advantage of both mechanisms over CDM is that local stakeholders, particularly small farmers, can be involved in the planning and implementation process more easily. The possibility of mixed financing for small farmers, combining income from agriculture and carbon certificates and/or Payment for Ecosystem Services, is ensured by both mechanisms. We recommend building cooperatives to provide larger areas for reforestation for small farmers. Furthermore, forest conservation and restoration efforts under the Mata Atlântica law (APPs, RFLs) should be supported. However, it remains open if the main targets of climate change mitigation and environmental protection can be better achieved under the REDD+ or the PES umbrella.

In case the Brazilian government goes forward with the creation of a national REDD+ framework, many barriers have to be overcome. This applies particularly to:

- the development of standard methodologies for REDD+ in rural, peri-urban and urban areas,
- information, participation, organization in the planning and implementation process,
- the structure of the funding mechanism including criteria for the generation of certified REDD+ emission reductions,
- monitoring, reporting, and verification,

- baseline and reference emissions scenarios, and
- the legal structure.

Moreover, risks and uncertainties, such as the problem of carbon leakage, land speculation, land grabs, and risks of crime have to be minimized. If these barriers, risks and uncertainties can be handled, REDD+ may be an adequate instrument for climate change mitigation and environmental protection at national, subnational and regional scale. In any case, the isolated REDD+ projects need to be replaced by a national REDD+ regime. It may be that the current uncertainty will be resolved shortly with the adoption of a national REDD+ system, currently discussed under Law projects 5586/09 and 195/11.

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## **National Policy, Local Impacts: Development of Wind Branches in Northeast Brazil**

Alice Nataraja Garcia Santos (Tübingen)

### **Abstract**

This paper aims at reflecting on the local impacts of Brazilian wind energy policies implemented by national government since 2002. Since then, wind energy has become the second cheapest renewable energy source in Brazil and its percentage in the national energy mix is expected to increase substantially in the next years.

The government's discourse that wind parks have little impact and stimulate regional and local development is here called into question by an empirical evaluation of a local experience. This article provides the case-study of the small community Cumbe in the municipality of Aracati, state of Ceará (CE), situated on the northeast coast of Brazil. In this place, significant socio-ecological and economic effects of wind parks have been affecting especially underprivileged groups and have led to heated conflicts between the wind firm Bons Ventos S.A and members of the local community.

Based on the theoretical approach of political ecology, our first goal is to analyze those mechanisms that produce and reinforce social and spatial inequalities and environmental injustice on behalf of the expansion and profitability of the wind energy sector in Brazil.

Our second task is to go beyond a critical view of wind energy regulation policies, and present some alternative instruments of economic management which target local development in the Cumbe community, showing that an economic approach may extend beyond the perspective of economic growth.

The main problems related to environmental injustice in the northeast of Brazil in general, and in the Cumbe community in particular, are inefficient environmental agencies, deficits in the political power of local communities and a lack of compensation policies for the areas affected by the wind parks.

## **1 Introduction**

This paper aims at reflecting on the local impacts of Brazilian wind energy policies implemented by national government since 2002. Since then, wind energy has turned into the second cheapest renewable energy source in Brazil and its percentage in the national energy mix is expected to increase from 1% in 2012 to 5% in 2014 (NZZ 2012).

The government's discourse that wind parks have little impact and stimulate regional and local development is called into question by an empirical evaluation of local experiences. Those experiences give rise to the following questions: what are the goals and strategies of the wind energy policy and what are its effects on different places and on different groups of interest?

This article provides the case-study of the small community Cumbe in the municipality of Aracati, state of Ceará (CE), situated on the northeast coast of Brazil. In this place, the significant socio-ecological and economic influence of wind parks has been affecting especially underprivileged groups and has led to heated conflicts between the wind firm Bons Ventos S.A and local community members.

Inspired by the interdisciplinary approach of political ecology, we prioritize an institutional analysis of this issue. We try to understand the regulative framework of the wind energy sector – on its global, national and regional scales – and its interactions with this conflictual social, political, economic, and environmental local context. In this sense, our first goal is to analyze those mechanisms that produce and reinforce social inequalities and environmental injustice on the behalf of the expansion and profitability of the wind energy sector in Brazil.

A second task of this paper is to go beyond a critical view of wind energy regulation policy, and present some alternative regulative and management instruments that may actually be beneficial toward local development in the Cumbe community. Here we use the methodological approach of THEO RAUCH, who, based on long experience with development cooperation programs, presents some relevant management instruments to aid local development (RAUCH 2009, p. 119). Although his approach considers the economic, the environmental, the political and the socio-cultural dimensions, we have selected the economic dimension, showing that the economic approach may go beyond the scope of economic growth.

The following two sections focus on the theoretical and methodological basis of the research. The fourth section provides an outlook on the wind energy policies at different scales of analysis. The fifth section then presents some instruments of economic management, targeting especially underprivileged groups affected by the wind parks, which

could help tackle conflicts involving wind parks in northeast Brazil. In the sixth section our final considerations are presented.

## **2 Theoretical approach**

Political ecology appeared during the 1970s as a new theoretical approach to environmental problems, no longer seeing them as a result of population growth, inefficient management or inappropriate technology, but as a social phenomenon that originated from the unequal distribution of political and economic power over resources (WATTS and PEET 2006a, p. 7).

Since then, this interdisciplinary research field has paid attention to environmental struggles, analyzing them along the lines of the concepts of power, governance and justice. About thirty years after the appearance of political ecology in the academic debate, WATTS and PEET (2006a, pp. 3-43) looked back at what had been done since, suggested some new directions and emphasized the role of political ecology in the political struggle against neo-liberal capitalistic systems – more specifically by analyzing the mechanisms that allow the concentration of power and privileges under neo-liberal institutions and market agents (WATTS and PEET 2006b, p. xv).

As the authors point out, these mechanisms work basically through new forms of confinement, which means control over resources, over knowledge and over manpower, leading to a dispossession of rights for the majority of people (WATTS and PEET 2006b, p. xvi). This perspective is extremely relevant to the present discussion as it analyzes the relation between economic growth and its impact on the environment. The importance of the role of institutions when it comes to managing such relations is our main focus.

According to WATTS and PEET (2006a, p. 4), political ecology has to acknowledge two processes involved in capitalist evolution during the last three decades. One is the intensification of environmental problems, due to growth in the technology sector, expanding industrialization in developing countries and deregulation of the economy (WATTS and PEET, p. 4). The second one is a greater social concern with the environment resulting in the appearance of a number of green discourses.

As the authors explain, these two processes are related to an important contradiction within neo-liberal capitalism (WATTS and PEET 2006b, p. xiv). On one hand there is the inevitability of economic growth. All social classes depend on it as it creates jobs, income and consumption. Politics depends on it, because it concerns popular interest and because parties' campaigns tend to be financed by big economic corporations, meaning that political parties from both the left and the right are growth-oriented.

On the other hand, neo-liberal capitalism is affected by the inevitability of the environmental consequences of unregulated economic growth. This is where environmental discourse plays a key role. Several strategies to find a way out of this contradiction emerge from state and governance institutions and from environmental movements and civic society. The main strategy is the creation of ideas and concepts that would conciliate growth and the environment such as the notion of sustainable development (WATTS and PEET 2006b, p. xv). Its mainstream conception defines development as economic growth that enables employment and consumption, which are seen as the main sources of mass contentment.

According to this conception, sustainable would mean “the necessary social, cultural or environmental consequences of an even more necessary growth process” (WATTS and PEET 2006b, p. xv). So there is a tension in society when it comes to agreeing on the level of tolerance for these consequences (WATTS and PEET 2006b, p. xv). We must bear in mind that the exposure and vulnerability to such environmental consequences, as well as the (political) ability to keep them from affecting one’s daily life malevolently, vary greatly and to the disfavour of the underprivileged (ACSELRAD 2010, p. 111).

A second strategy to solve this system’s contradiction is a rearrangement of the regulatory framework, giving more power to global governance institutions – such as the World Trade Organization or WTO and the International Monetary Fund - under the pretext that they are able to ensure economic growth while keeping to environmental regulations (WATTS and PEET 2006b, p. xv). The authors talk about “masking devices”, saying that the WTO’s role is more about taking control over economic decisions, claiming environmental concern and calming down social critics, while ruling against environmental restrictions. With the WTO being one of the most powerful institutions of the global economy, signing its agreement has almost become a *sine qua non* for participating in the global economy. Moreover, multilateral agreements concerning environmental issues, which the WTO encourages, are not being enforced. Still, even this strategy has opened space for social protest against global mechanisms that concentrate power in some places and on some groups of interest (WATTS and PEET 2006b, p. xv).

On this basis, WATTS and PEET define two discussions as being central to political ecology studies (WATTS and PEET 2006a, p. 4). One is about the distribution of power over resources and how this has been affecting the environment and livelihoods especially of underprivileged groups. The second one, particularly relevant for geographers, is about how environmental conflicts and regulations present themselves globally, nationally, regionally and locally and require a multiscale approach from researchers (WATTS and PEET 2006a, p. 4). Analyzing the institutional scenario behind environmental conflicts and discourses is one of the main challenges of political ecology, on which we shall engage in this article.

One case study that was very inspiring for developing our case study is the one brought by DUBASH in the same book edited by WATTS and PEET in 2006 (DUBASH 2006, pp. 3-43). DUBASH offers an example of how political ecology may approach problems of resource management showing that a lack of or a mistaken market regulation reproduces social exclusion and unbalanced power relations (DUBASH 2006, p. 219). His approach focuses on a more historical and local view of how such markets are shaped in order to understand their functioning and socio-economic and environmental impact. Presenting the case of water markets in western India, he shows how these markets are influenced by different processes such as the creation of political institutions, social practices, natural characteristics and historical circumstances, on global, national, regional and local scales (DUBASH 2006, p. 218). The author argues that this procedure, firstly, questions the view of the market as an abstract, efficient and independent mechanism of regulation, highlighting its relations to the social and political realms. Secondly, it considers the influence of ecological processes – in relation to social processes – on the shape of markets (DUBASH 2006, p. 219).

DUBASH does not stand out for or against the private management of resource markets, but for a higher commitment of economic regulation and activity to social issues (DUBASH 2006, p. 222). He believes that this is the main goal of political struggles over water. Although initially based upon local and national movements, international society networks and institutions such as the World Commission on Dams were also created. These institutions have never achieved their goal to ensure consideration of the rights of underprivileged groups when planning the use of water and, more broadly, to “re-embed economic decisions in social life” (DUBASH 2006, p. 223). Nevertheless their establishment has opened up debate and brought new ideas to the political arena of water, making space for local movements.

WEISS (2010, pp. 21-36) presents a similar perspective from the side view of the energy market. He shows how the energy market is more a result of social and political processes such as interest struggles, and also a result of concrete factors such as the availability of infrastructure, resources and manpower, than a result of abstract economic processes of market regulation. He also emphasizes that these markets are built up not only on a global scale, but also on lower scales, involving mutual influence between context-based processes and global ones.

The author has analyzed the development of the renewable energy sector in developed countries, based on regulation theory (WEISS 2010, pp. 21-36). According to him, especially in the 1990s and 2000s scarcity, high prices and the environmental costs of fossil resources reduced the profits of the energy sector. Two responses to this crisis were the liberalization of the energy market and the development of renewable sources, enabling new profits and reducing environmental pressure (WEISS 2010, pp. 29-30).

Opinions, however, diverge on the question of what the main forces driving the sector of renewable energy are. Some talk about a centralized model according to which big and traditional firms own the renewable sector, centralizing decisions (WEISS 2010, p. 27). Their main strategies are scale effects and the reduction of political barriers to the implementation of big energy projects. Other authors talk about a decentralized model according to which profits and decisions are decentralized among smaller firms (WEISS 2010, p. 26). In this picture, economic efficiency, environmental balance and participative policies tend to meet.

Here it is relevant to underline that according to WEISS these models should not be seen as simple adaptations to production factors but viewed in a deeper sense as the result of complex processes of negotiation among actors (WEISS 2010, p. 28). According to the author, these two models might also coexist. Effectively, in each place the industry adopts differentiated strategies to profit from the particular social, economic, political and environmental framework.

Interdisciplinary studies on environmental justice have been addressing the fact that the environmental costs of economic activity are unequally distributed among countries and among social groups, reflecting unequal economic and political power to avoid environmental costs and damages (ACSELRAD 2010, p. 109). Polluting activities usually migrate to developing countries where environmental laws are weaker or easily circumvented (ACSELRAD 2010 p. 113). The same logic can be observed within countries and cities (ACSELRAD 2010 p. 114).

Based on the theoretical contributions presented above, we have formulated some hypothetical ideas. We observe that the wind sector in Brazil has developed based on big firms, with projects for big parks being financed by the federal government. This process is accompanied by a discourse: the promise to offer local development based on the generation of a clean source of energy with low impact. Nevertheless, although it is effectively associated with positive images of environmental concern in developed countries, the wind branch in Brazil is emerging in a different economic, ecological, social and political framework. Consequently, wind power companies adopt other strategies, profiting from the lesser power of environmental institutions and of environmental movements in Brazil.

In this sense, this paper aims at: 1) understanding how the wind power sector has been managed and regulated at global, national, regional and local scales; 2) analyzing some of its ecological, economic and social impacts from a local point of view; 3) finding instruments of management of the wind sector that may ensure more fair and sustainable local economic development.

As mentioned, due to space limitations we prioritize an economic approach to local development, based on ideals of environmental sustainability, democratic participation and

poverty reduction. These three aspects are key factors to economic development according to RAUCH (2009, pp. 137-204).

### **3 Methodological approach**

THEO RAUCH published a book on developing policies in which he is mostly concerned with the creation of strategies and instruments for a more effective management of political, economic, social and environmental problems, especially in developing countries (RAUCH 2009, pp. 119-354). He bases his arguments on his vast personal experience with development cooperation programs as well as on a theoretical analysis of the social challenges that his experiences have shown (RAUCH 2009, p. 119).

His theoretical approach tries to achieve a synthesis of two main currents of sociology theory, that is, structuralism and social action theory (RAUCH 2009, p. 126). He looks at the relations between manoeuvring space for social actors and the social and economic conditions which deny or offer them opportunities. He sees such relations as not being determined by main structures such as the rule of the global market, nor by social action such as local social movements or consumer choice, but as resulting from historical and context specific circumstances. In each context structure or actors' choices will influence each other in a different way (RAUCH 2009, p. 127).

He thus believes that in each studied case the economic, the institutional, the social and the ecological framework have to be considered, as well as the different scales influencing them. Regarding the economic framework, the global scale tends to play a major role. In the institutional, the national scale is the one enforcing decisions. In the social cultural, regional or international groups justify norms and values in terms of ethnic, cultural or religious identity. In the ecological framework, all scales play an important role in establishing and enforcing environmental laws (RAUCH 2009, p. 127).

He goes further, pointing out that the dimensions keep influencing each other. A second important claim is that most local actors have no access to or influence on the higher levels of political or economic action such as competitive regional markets (RAUCH 2009, p. 127). Development policies should therefore always consider all scales and dimensions, even if there is one main scale of influence. In the case of accessing income possibilities for poor farmers in developing countries, it is not enough to create fairer rules for global trade between countries if farmers do not receive the financial and technical support to enable them to offer better products suitable for the global market. Such support should come from national and regional governments. Also, farmers should be locally empowered to represent their interests through social civic organization.

With this in mind, this article will focus on the local impact of wind energy policies, considering a multi-scale approach to the role of institutions in creating, or not creating,

the conditions for sustainable economic growth oriented toward poverty reduction. As mentioned, it presents an economic analysis that must be further integrated into the ecological, institutional and socio-cultural analyses of the topic. Due to the initial state of the research, we use primary results based on the qualitative analysis of various sources such as literature, secondary data, interviews with specialists and the observations of initial field research.

Our methodology involves firstly a literature survey of the institutional framework of the wind energy sector. It begins with a historical review of the main social, economic and ecological factors influencing the emergence of a wind energy market and therefore of a global institutional framework concerned with its regulation. Our survey goes on to relate this context to the development of a wind energy market in Brazil. Then we focus on the regional management of the wind energy sector in the northeast of Brazil and its contribution towards sustainable economic development. Finally, the local view leads us to a more accurate analysis of the impact of Brazilian wind energy policies on local development.

Our second methodological step is analyzing regulation and management instruments that could help to ensure that the wind energy sector indeed contributes to more sustainable local development in the Cumbe community. Using the instruments described by RAUCH (RAUCH 2009, pp. 137-204), the analysis of related literature, the analysis of three interviews and of initial field research, some strategies of resource management that could apply to the case study will be described.

Before getting into the analysis itself, we would add that this paper considers local development as a process based on the reduction of environmental damage, the participation of local actors in the management of resources, and strategies for poverty reduction. These principles are constantly present throughout RAUCH'S analysis described here (RAUCH 2009, pp. 137-354).

## **4 Recognizing context: wind power policies**

### **4.1 Global context**

Looking at the global scale, some events affected the environmental agenda significantly, drawing attention to the development of renewable sources of energy. In 1972 the United Nations Conference on the Human Environment in Stockholm pointed out the need for a common outlook of measures to protect and improve the human environment (UNEP 2011). After 1986 the role of atomic energy in the world's energy mix was revised. If it had been seen as a source that, besides being renewable, was free of GHG emissions, after history's worst atomic accident in Chernobyl its social and environmental safety was starting to be questioned (DUTRA 2007, p. 9). In Europe and in the United States, series

of environmental movements arose between 1980 and 1990 pressuring governments to invest in alternative, renewable energy sources (DUTRA 2007, p. 9).

In 1998 the United Nations Environment Program created the Intergovernmental Panel on Climate Change to collect and provide recent research on climate change to governments (IPCC 2010). Their first report, the Panel Climate Change in 1990, unequivocally showed the urgency of facing up to climate change. This was the motivation for the creation of the United Nations Framework Convention on Climate Change. This Convention plays a key role in the international control of climate change. Its second report of 1995 settled the basis for the adoption of the Kyoto Protocol in 1997 (IPCC 2010). This Protocol created certain commitments between participating countries (UNFCCC 2010). Since 1990, this context has stimulated the creation of policies for the development of renewable sources of energy in Europe (DUTRA 2007, p. 18).

As mentioned here before, the so called greening of global governance must be seen with some degree of criticism. On the other hand, this is exactly the context in which the policies for the development of renewable sources of energy started being created and enforced (DUTRA 2007, p. 18).

DUTRA analyzes renewable energy policies for the wind sector from the perspective of energetic planning, showing how important public policies are for the success of this branch (DUTRA 2007, p. 159). Based on the examples of experienced countries such as Germany and England, he also shows that the environmental benefits that wind energy can bring are many, as it is an energy that generates no waste, gas pollution or radioactive waste (DUTRA 2007, p. 9). In addition, the sector's technology has been developing rapidly and increasing its efficiency and profits (DUTRA 2007, p. 11). Taking into account environmental rules and landscape planning, wind parks can also exist close to populated areas (SCHWAHN 2000, p. 60).

A further advantage is that their structure allows small farmers to maintain ownership of their land, get fair leases and make profits (Agentur für Erneuerbare Energie 2011, p. 17). It also stimulates their involvement with the negotiation of energy issues and ecological issues affecting their surroundings (Agentur für Erneuerbare Energie 2011, p. 17). Finally, the new wind farms create several temporary and stable jobs in infrastructure construction, equipment maintenance and in some of the industries and services which are part of the wind energy value chain (Agentur für Erneuerbare Energie 2010, p. 5).

Nevertheless, some factors of a different nature count against wind energy in some countries (DUTRA 2007, p. 5). Although it is renewable, it depends on the oscillation of winds and is difficult to store. Secondly, if not planned carefully, the towers can increase the mortality of bird species. Finally, the turbines' presence in the landscape is striking and

often annoys residents or agents who make a living out of the tourism industry. Nevertheless, in some countries with accumulated experience like Germany, efficient planning constantly finds new solutions (SCHWAHN 2000, p. 60).

As we shall see, the advantages and disadvantages of wind power exploitation in Brazil are significantly different, as they are subject to distinctive geographical, institutional, economic and socio-cultural contexts. Initiatives encouraging renewable sources of energy on a global scale started having greater, concrete consequences on the Brazilian energy system especially from 1992 onwards (DUTRA 2007, p. 160).

## **4.2 National context**

The first major Brazilian impulse toward the production of renewable energy occurred in the 1970s, but was still limited to economic intentions. At that point the federal government created a policy for fuel alcohol, wishing to protect the national economy from the high oil prices that followed the oil crisis of 1973 (XAVIER and GUIMARÃES 2009, p. 199). This public policy was called Proalcool<sup>1</sup>.

A further landmark for the energy system in Brazil was the creation of the National Agency (ANEEL) in 1996. The country ran a wave of privatization, affecting, among other things, the energy sector, and created regulatory agencies through which the state was to exert a regulative role, instead of an executive one (XAVIER and GUIMARÃES 2009, p. 177). In 1997 a new policy, the National Energy Policy (Plano Nacional de Energia) defined the goal of diversifying the energy mix, for the purposes of achieving universal access to electricity and sustainability (XAVIER and GUIMARÃES 2009, p. 12). The concern with energy scarcity and climate change started to be integrated into energy politics in Brazil.

As already mentioned, the global environmental agenda started to have greater influence on Brazilian politics after the ECO 92, albeit slowly. After hosting the second United Nations Conference on the Human Environment in Rio de Janeiro in 1992, Brazil set up the first pilot projects on solar photovoltaic energy and wind energy, based on agreements for the adoption of German and North American technologies (DUTRA 2007, p. 160).

It took some time, though, until the first successful policy on renewable energy was implemented. The so called PROINFA (Program to Promote Alternative Energy Sources) was published only in 2002 and is the main mechanism for encouraging renewable energy, specifically wind power, biomass (mainly from sugar cane, rice hulls, traces of wood and landfill gas) and small hydroelectric plants (DUTRA 2007, p. 183). The Brazilian Go-

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<sup>1</sup> Programa Nacional do Álcool Combustível<sup>1</sup>, 1975 (XAVIER and GUIMARÃES 2009, p. 199).

vernment was trying to diversify its energy mix through fiscal and financial incentives and guarantees.

The percentage of new renewable sources in the national energy mix is low when we refer to small hydroelectric plants, wind power, biomass and photovoltaic. Traditional big hydro-power plants are responsible for roughly 71.2% of the national power production (ANEEL 2008, p. 35). Despite being a renewable source, hydropower shows significant territorial impact and is subject to the unreliability of rainfall (ANEEL 2002, p. 45). Droughts have already brought the country to power rationing crises. Another relevant aspect of the Brazilian energy system is the fact that many citizens lack access to electricity, particularly in rural areas (CRESEB/CEPEL 2001, p. 10).

In this context, the main goals of national energy politics are: 1) the expansion of the power generating capacity in the country, including diversifying the energy mix, 2) universal power supply in rural areas, 3) increasing interconnection of the electricity transmission systems. (CRESEB/CEPEL 2001, p. 10).

From 2007 the PROINFA received extra funds from the Growth Acceleration Program of the federal government, the so called PAC. Since 2009, public auctions have replaced the PROINFA as a new regulatory instrument for the sector.

According to DUTRA (interview, 22 July 2011, Rio de Janeiro), a researcher of the CEPEL, Centro de Pesquisas de Energia Elétrica (Research Centre for Electric Power/Department for Special Technologies), the auctions create competitiveness and guarantee stable contracts for roughly twenty years with power distribution companies. All firms who wish to participate must submit their projects to the Empresa de Pesquisa Energética (Energy Research Company). On the other hand, following DUTRA, this system also guarantees that projects fit certain technical requirements such as: efficiency, accordance to demand and a percentage of use of national products and services.

In 2009 and 2010, the ANEEL, Agência Nacional de Energia Elétrica (National Agency of Electrical Power), held two public auctions for renewable energy, where wind power gained prominence by offering the majority of projects at the most competitive prices (EPE 2010, p. 2). Investments in wind power plants are growing rapidly. This is what the value of loans granted for wind parks by the BNDES shows: 353 million dollars in 2010 and roughly 2.4 billion dollars in 2011 (SUDIC 2011).

From a regional perspective, the focus of investments is in the northeast, where the wind speed reaches 7 m/s along the coast (DUTRA 2007, p. 190). A further advantage of the northeast of the country is that in the months when wind is abundant, the reservoirs of hydroelectric plants are in deficit due to seasonal droughts (DUTRA 2007, p. 6). The in-

verse situation occurs during the rainy season, when winds become less intense. The wind potential in the region has been exploited with the direct support of the BNB, Banco do Nordeste do Brasil (Development Bank of the Northeast) – an executing agency of public policies aimed at regional development (Diario do Nordeste 2011).

This region has the lowest indices of human development of the country (BNB 2009, p.41). In addition, the interior portion of its territory is marked by an annual long dry period. Irrigation mitigates the problem and requires energy. The goals of BNB's policy of supporting wind energy are to reduce the energy dependence of the northeast, generate employment and improve the qualification of manpower in the region (Diario do Nordeste 2011).

### **4.3 Sub-regional context**

The state of Ceará offers one of the highest wind speeds in the northeast region. This state has a low water potential, and imports more than half of its energy. Therefore, since the 1990s the government has been adopting strategies to diversify its energy mix. Nowadays, CE accounts for 55% of the installed capacity of wind power in Brazil (ANEEL 2011).

The high wind potential of the state led in the early 1990s to an agreement between state companies and a German research institute, with the goal of identifying the wind resources available and the most favourable areas for the deployment of parks (LAGE 2001, p. 124). Later, a partnership between public companies and the financial support of the German government resulted in the first wind farm in Brazil, in Porto Mucuripe (LAGE 2001, p. 101). According to LAGE, this park is part of the Sustainable Development Plan of Ceará of 1992, which was created to diversify the energy mix, reduce energy dependency and expand energy access to rural areas for irrigation and water pumping (LAGE 2001, p. 75).

LAGE's Master's thesis evaluated the sustainability of the project for wind power in this state (LAGE 2001, pp. 1-157). At that time, beyond the pilot project, only two private parks were in operation. His research concluded that the sustainability of the wind projects was unquestionable (LAGE 2001, p. 115).

Only two exceptions were made: 1) the projects did not include the development of research and technology in the state, 2) society's participation in the discussion of the projects was disregarded or reduced to a survey of people's expectations (LAGE 2001, p. 125). However, in terms of economy, society, ecology and space, LAGE identified a very positive scenario that includes: preservation of traditional economic activities, respect for local ecosystems and creation of work places (LAGE 2001, p. 129).

LAGE (2001) seems to have analyzed a nascent stage. Since then, the installed potential of CE has increased from about 12 MW to 518 MW (ANEEL, 2011). Nowadays, the negative ecological and socio-economic impact of wind parks in CE has been reported to the press by local communities (Diário do Nordeste 2010) and studied by researchers like LIMA (2008, pp. 1-16) and MEIRELLES (2008, pp. 1-7).

Another relevant factor, beside the larger amount of wind parks, is the expansion of other activities which exploit the resources of the coast of CE as well, such as tourism and shrimp farming, generating further relevant impacts. This aggravates ecological and socio-economic problems for the communities (LIMA 2008, p. 1).

#### 4.4 Local context

Aracati is a municipality situated 149 km from the capital Fortaleza. Two companies control the wind sector in the municipality. The Rosa dos Ventos/SA maintains the farms Canoa Quebrada RV and Lagoa do Mato. The enterprise Bons Ventos Generators SA maintains the farms Canoa Quebrada BV, Enacel and Bons Ventos. Together all these wind farms have a power of 152 MW (ANEEL 2011). For 2012, two new investments are expected (Aracati em Foco 2011).

Aracati has about 69,000 residents, 64% of whom live in urban areas (Governo do Ceará 2000). Its most important economic activities are tourism, the export of fish and shrimp,

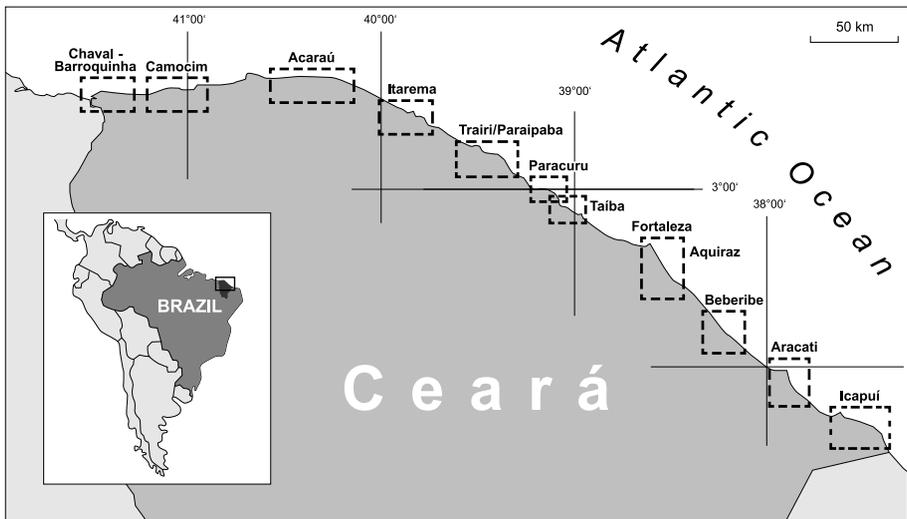


Figure 1: Zones with wind parks on the coast of Ceará

Source: MEIRELLES, 2011, modified

and the production of leather footwear (BNDES/REDESIST, 2010). In 2008 MEIRELLES compiled a report on environmental impact related to the future construction of the wind farms by Bons Ventos S.A in the area (MEIRELLES 2008, pp.1-7). The main findings will be presented here.

In general, the installation of wind turbines on the top of dunes involves three measures of significant impact: 1) the construction of access ways between towers and controlling and administrative houses; 2) protecting towers and roads against the sand; 3) installation of transmission cables below the surface. The ecological systems mainly affected are: 1) mobile and fixed dunes, 2) fluvial-lake systems; 3) mangroves. The reported occurrences are: 1) compaction, fragmentation and fixation of dunes (Figure 2 shows these three actions); 2) buried lakes (Figure 3 shows a lake partially buried due to the construction of a road); 3) degraded mangroves. The main consequences are: 1) unbalance in the chain of interdependence between the ecosystems, 2) threats to the local fauna and flora; 3) erosion of the beaches; 4) groundwater damage. These processes were observed: a) during the period of implementation; b) during the operation of the farms.



*Figure 2: Fixation of dunes in Cumbe*

*Source: Photograph taken by the author during field research, 19 July 2011*



*Figure 3: Partially buried lake in Cumbe*

*Source: Photograph taken by the author during field research, 19 July 2011*

The socio-economic impact on the communities is critical. These are: 1) privatization of public spaces (Figure 4 shows that the beach was closed for inhabitants of Cumbe); 2) closing access to the rivers and the sea, used by fishermen; 3) threats to the hydrostatic equilibrium and water availability in Aracati; 4) disturbance with the large numbers of big trucks passing through villages threatening the structure of the houses; 5) threats to houses due to the beach erosion and sea advance; 6) landscape degradation, affecting the potential of ecologic tourism (which is a source of income for the community) and the use of the area for didactic and scientific purposes.

Three further aspects were noted: 1) cumulative impact on the area due to previous economic activities and further wind farms; 2) threats to environmental systems of contention of climate change effects as established by the IPCC of 2007; 3) degradation of archaeological sites with loss of scientific information.

As presented here, MEIRELLES's report identifies the existence of a set of mutually influencing social, ecological and economic factors (MEIRELLES 2008, pp. 1-7). He underlines



*Figure 4: Gateway to the Wind Park Bons Ventos*

*Source: Photograph taken by the author during field research, 19 July 2011*

how important it is for projects to be preceded by serious impact studies that contain alternatives to the project (MEIRELLES 2008, p. 2). When interviewed by a local media agency, he affirmed that problems like the ones encountered on the coast of CE could be avoided if the location of parks took into account not only economic benefits but also the environmental and social impact of projects (UOL Online Noticias 2009). Areas with wind speeds of 6m/s behind the dunes – a velocity that still meets profitability patterns according to DUTRA (DUTRA 2007, p. 223) – would cause less negative impact to the site, but were neglected in favour of the areas on the top of dunes, where wind reaches more attractive speeds of 8m/s.

His statements show us how the decision about the position of parks depends on a conflict of interests where the decision making power of the actors differs considerably.

To deal with this complexity of interests, the coastal communities of CE have been organizing themselves in defence of a shared management of the coastal zone. LIMA has accompanied this process (LIMA 2008, pp. 1-16). According to the author, the communities of the coast of CE have the following common goals: preservation of the coastal territory, preservation of ecosystems, land tenure security, permanence of traditional economic

activities; incorporation, if necessary, of community tourism; and preservation of the livelihoods of fishing communities and indigenous peoples (LIMA 2008, p. 15).

In the Cumbe community, the main actors involved in the conflict over wind farms are wind companies, local communities, the Environment Council of Ceará (COMAC), the Public Prosecution and the National Institute of Heritage. The licensing of projects has been facilitated by the COMAC. Simplified environmental reports, which disregard many factors and do not present alternatives to the projects, have been accepted (MEIRELLES 2008, p.6). Therefore, affected communities sought to represent their interests directly in front of the federal judiciary – work on the wind park was temporarily suspended due to the verification of serious negative environmental and social impacts on the community (UOL Online Notícias 2009).

As we have seen, the wind sector in Brazil is expanding with large projects funded by federal resources, characterized mostly by little socio-environmental commitment. This context has been generating relevant local conflicts (MEIRELLES 2011, pp. 1-25). A first analysis of the institutional framework supporting, at different scales, the expansion of the wind industry in Brazil shows that, in the case of the Cumbe community, there is a network of interests and actors directly or indirectly involved (global governance agencies, private actors, public organizations and community inhabitants). They act on the basis of different perspectives and spatial frameworks. THEO RAUCH'S approach (2009, pp. 137-204) may thus reach the different scales that need to be considered in order to propose solutions for this scenario of conflicts.

## **5 Search for possible solutions**

### **5.1 Describing the case-study**

In the search for possible strategies to tackle conflict in Cumbe we shall first describe the village. The description is mainly based on local observation and an interview with one inhabitant who participates in the movement to gain compensation for the wind park's impact (interview, Aracati, Cumbe, 19 July 2011).

Cumbe was built between mangroves and dunes. It consists of roughly 150 families and 600 inhabitants, who basically make their living from fishing, sewing crafts, tourism and subsistence farming. It has suffered from severe social, political, economic and environmental impacts brought on by the process of water extraction since 1970 and by shrimp farming since 1996.

It has one primary school and no hospital, but a health assistance facility that functions part time. The arrival of the wind firm was announced in 2008 when a discussion forum took place with community members, environmental agencies, government representa-

tives and wind firm representatives being present. Many promises of work and service amelioration were made but have not been fulfilled, as we will further examine.

Investments in the area are financed by the BNDES, Banco Nacional do Desenvolvimento (National Bank for Development), and the BN, Banco do Nordeste do Brasil (Bank for Development of the Northeast), under the auspices of the PAC, Programa de Aceleração do Crescimento (Federal Program for Growth Acceleration), and the energy national plan that aims for the diversification of energy sources and the increase of energy supply. The energy produced by the parks goes directly into the integrated national system of energy distribution and has no direct influence on the inhabitants of Cumbe regarding their access to energy or the price they pay for it.

The arrival of wind firms in the community has not caused the expected economic benefit for the local community, such as a significant number of jobs, manpower qualifications, or significant infrastructural amelioration enhancing local amenities and elevating standards of living. On the contrary, almost all the job positions were filled by external labour because local inhabitants were under-qualified. No training courses were offered to local manual labourers. A considerable number of local people were hired, nevertheless, for a short period of time, during the period of constructing the roads, for carrying heavy materials.

This population basically makes its living from fishing. With the installation of the parks on top of the dunes and the construction of enclosures, their usual access to the beach was denied to the inhabitants, directly affecting one of their main sources of income.

Other economic losses were due to the construction of a road through the village for the frequent passing of the huge trucks, which damaged the structure of houses. An impact that is still occurring during the rainy season is the accumulation of mud on the road. This makes normal navigation of the road difficult or even impossible for some vehicles. Moreover, the road has been built above the level of the houses and causes runoff of water on houses situated along the road.

Certainly, the source of economic problems for this community goes well beyond the wind power activity. Possible solutions depend on complex factors such as the general difficulty of maintaining traditional livelihood systems in a globalized world. The arrival of shrimp farmers in 1996 who produced more efficiently than the locals, denied the local shrimp fishermen access to the mangroves and to the markets.

If we consider that the wind power activity actually reduces the standard of living for Cumbe's inhabitants, as, on the one hand, their access to the beach is restricted, and, on

the other hand, their qualification level is much below the required standard, a compensation policy could be used to support other economic activities targeting the development of local economic potential.

The main goal of the following discussion is to look for elements of RAUCH's approach to economic development that enable a new view to be taken of relevant aspects of the growth of the wind sector and its local impact in northeast Brazil, and then to point out some possible solutions (RAUCH 2009, pp. 137-204).

## **5.2 Local scale**

The enhancement of the wind industry in Brazil has caused the concentration of wind parks, attraction of related industries and improvement of the infrastructure of power transmission and of transport in the NE (ADECE 2010; Governo do CE 2011). However, as RAUCH explains, normally the enhancement of economic possibilities on the regional scale and the improvement of trade leeway at global and national scales profit stronger economic actors at the expense of underprivileged and marginalized people (RAUCH 2009, p. 198). This is due to the fact that people restricted to local traditional knowledge are often not able to deal with the challenge of a globalized market and to use new opportunities effectively (RAUCH 2009, p. 198).

For this reason, according to RAUCH, a main goal of developing policies on a local scale would be to enable poor groups to profit from the economic possibilities created on a higher level. Nevertheless, RAUCH believes that more powerful economic agents should also be included in developing policies (RAUCH 2009, p. 199). He argues that bigger local agents have the potential to explore possibilities that are too risky for small producers; this may then contribute to regional economic growth, increase employment and market possibilities for others, and improve access to services. In this sense, we believe that the chances of the wind power sector, with its high investment costs in terms of infrastructure and technology, should continue to be supported by public policies. Nevertheless this should involve the reinvestment of part of the profits to the benefit of pro-poor oriented economic development, through development policies.

Another relevant aspect is that such actors are normally influential on the municipal or district parliament and could try to convert or turn pro-poor projects in their favour if their interests as local elite are not considered (RAUCH 2009, p. 199). An effective policy aiming at local development in Cumbe and on the municipal level thus has to consider income potentials both for the poor and local elites.

### **5.3 Regional scale**

The northeast region has some alarming social and political problems such as high levels of poverty, illiteracy, property accumulation and unstable labour relations (DUARTE 2001). Therefore economic gains from wind activity could be reinvested in the region to the benefit of target groups of underprivileged people. Two instruments of regional development described by RAUCH are presented in the next section (RAUCH 2009, pp. 170-198).

#### **5.3.1 Poverty and livelihood-oriented economic program**

The goal here is to identify and create economic opportunities especially for poor populations by adopting a diversified, multi-local livelihood system (RAUCH 2009, pp. 173-174). RAUCH explains that instead of focusing on the efficiency of one source of income, small producers tend to keep their options open in order to face climatic, health, and market risk. Furthermore, when they have an income surplus they tend to help a family member instead of investing in means of production (RAUCH 2009, p. 174). According to RAUCH, the reason for this is that in their situation of being constantly at risk, it is more important to them to be able to rely on their social network for support than to target increased productivity. Relations with patrons, landowners, moneylenders and traders are also part of this protective social network. An efficient intervention in such livelihoods should consider all these conditions (RAUCH 2009, p. 173).

It is pertinent to mention that these social networks were a barrier to spontaneous opposition to the impact of the wind company in Cumbe. The few inhabitants that were employed by the company feared losing their jobs. As the Cumbe community consists of roughly 600 inhabitants from 150 families, this effect may be very strong. Many people prefer to keep quiet instead of putting the job of a relative at risk. This information is based on an open interview with an inhabitant of Cumbe, who participated in the official meetings between Bons Ventos S.A., government representatives and the community, and who also participated in the protest against Bons Ventos S.A. Company in 2009 (interview, Aracati, Cumbe, 19 July 2011).

#### **5.3.2 Systemic competitiveness through regional management**

This instrument focuses on the role of regional actors and on the creation of relevant institutions (RAUCH 2009, pp. 186-193). In RAUCH's opinion the region represents a space for common initiative against the pressure to conform imposed by a globalized world where national governments lose economic-political autonomy. In this sense, the goal of systemic competitiveness analysis is to increase a region's competitiveness in the context of a globalized economy (RAUCH 2009, p. 186).

RAUCH enumerates a few decisive factors: the creation of supportive political and administrative frameworks for entrepreneurship; the spatial concentration and networking of firms and educational/research institutions; and the actors' capability to cooperate. From this perspective, customizable institutional factors are more relevant than the usual location factors of a region (i.e. natural resources and geographical site) (RAUCH 2009, p. 186). RAUCH announces that "[...] Wettbewerbsfähigkeit einer Region ist kein Schicksal mehr, sie ist machbar!" ("the competitiveness of a region is no longer determined by fate, it is achievable!") (RAUCH 2009, p. 187).

Such a perspective is very relevant for northeast Brazil as it allows the questioning of the tenacious prejudice that the natural peculiarities of the region, especially its dry climate, are the cause of its social and economic problems, and facilitates an increased focus on political issues of power and management.

The systemic analysis is based on factors – mostly political-institutional ones – related to competitiveness (RAUCH 2009, p. 187). From one point of view, the northeast region seems to be building an efficient network of private and public actors who contribute to the development of the wind sector in the region. The regional bank (BN) offers financing through the national development bank (BNDS). Infrastructural interventions have been negotiated between governors and private agents (Diario do Nordeste 2009).

There are two important steps concerning systemic competitiveness. The first step is the creation of regular forums for interaction between politicians and public administrators, on the one hand, and the private sector and civil society, on the other. This should develop the habit of consultative processes and the ability to find consensus and engage coordinated actions (RAUCH 2009, p. 190-191).

In the northeast some new forums have been created for the wind power sector. Nevertheless, they include only strategic traders, politicians and public administrators. As an example, in the state of Rio Grande do Norte, a government initiative to create a wind power managing committee intended for the participation of investors (ABEEOLICA 2010), excluded environmental and social organizations. As some testimonials on the web forum of the Coastal Communities of CE (Instituto Terramar 2009) affirm, the civil society and the environmental organizations have been partially or entirely excluded from the decision making processes of wind parks.

The second step concerning systemic competitiveness is the creation of institutions for research development and for the analysis, coordination and moderation of consultative processes (RAUCH 2009, p. 191). In Brazil, we observe that a number of public and private actors are developing research, collecting data and exchanging information regarding wind power on specialized forums, as seen in the three editions of the Wind Forum

Brazil in São Paulo with contributions by global, supra-regional, national and regional organizations. Among partners of the meeting were investors, consumers and research organizations, but no environmental organization, development organization, consumer association or civil society organizations (Wind Forum Brazil 2011). In addition, consultative processes are still missing. Such processes could ensure, for example, that underprivileged peoples' perspectives are included in reports of impact, which would avoid future missteps from the early stages of planning.

Further on, RAUCH underlines that pro-poor growth depends on the regulation of the global market, otherwise the increased chances and competitiveness of regions will indeed tend to fail into predatory competition between the poor (RAUCH 2009, p. 204). The global scale is considered in Section 5.5, after the following consideration of management instruments ensuring sustainable and pro-poor oriented economic growth at a national level.

#### **5.4 National level**

According to RAUCH's approach, sustainable national economic growth involves firstly the support of activities with intensive labour demand – even if they have smaller economic growth potential, as is the case with subsistence farming – as long as there are insufficient alternatives and no better livelihood opportunities for those who depend on them (RAUCH 2009, p. 166).

Building on this for the case of Cumbe, it is relevant to support the access of fishermen, small farmers, sewing crafts and artisans to the market. Programs of further education, advisory measures, and financing should be created that focus on low-income groups (RAUCH 2009, p. 167). Such measures belong mainly to the local and regional scales. Nevertheless, the creation of the legal, institutional, and fiscal conditions for national economic policies oriented towards the poor lies in the hands of the national government (RAUCH 2009, p. 167).

Granting basic standards of quality of life to the population are prerequisites (RAUCH 2009, p. 167). In this sense, working to ameliorate transport infrastructure, water, leisure, health and education in Cumbe is required. This may be considered a social factor as it gives people more leverage for bargaining with the firms. We observe that it is a common practice that firms, in order to get the support of local inhabitants, promise infrastructure investments, which actually involve very little compensation considering their future impact on the communities. ACSELRAD describes this framework as one of the sources of environmental injustice (ACSELRAD 2010, pp. 114).

Secondly, the national level involves granting fair and stable prices and salaries (RAUCH 2009, p. 167). We would add that fair rates for house owners leasing their property to companies for the instalment of transmission lines passing through the houses should be legally ensured. In Cumbe, rates frequently vary according to the economic and political influence of house owners (Information based on interview, Aracati, Cumbe, 19 July 2011).

The economic effects of the wind power sector at national level have been, from one perspective, efficient and lucrative (EPE 2010). According to DUTRA, a researcher of the CEPTEL (Centre for Electric Power/Department for Special Technologies), in an interview (interview, 22 July 2011, Rio de Janeiro), the regulation system based on auction systems has reduced production costs and developed the national industry in line with the principle of the nationalization index. According to this principle, wind firms receive financial support from the Brazilian government only as long as they prove that they use a certain percentage of national products and services.

However, such industries are mostly located in bigger cities where infrastructure and manpower are available (ABEEólica 2011). This means that – for this and other reasons discussed above – the people suffering directly from the negative influences of the wind parks do not partake in the economic benefits of the positive development of the wind sector. In the next section we describe the role played by global institutions in this framework.

## **5.5 Global level**

Looking at the global scale, it is remarkable how the wind power branch has been growing – 22.9% from mid 2010 to mid 2011 – while enhancing the technology and efficiency of turbines and reducing the costs of wind energy (World Wind Energy Association 2011). How can the sector's growth be driven in a more sustainable direction?

THEO RAUCH establishes the creation of additional livelihood opportunities as the main global goal for developing policies (RAUCH 2009, p. 152). Key instruments are market policies to protect and facilitate the access of poor and developing countries to global trade (RAUCH 2009, p. 152). Global governance organizations such as The World Trade Organization (WTO) and Doha Round meetings should focus on work intensive activities that are able to offer large livelihood opportunities and activities with a chance of becoming internationally competitive (RAUCH 2009, p. 153). Tariff protection is one sort of supportive measure, which nevertheless has to be of limited duration and be gradually reduced over time in order to stimulate the achievement of competitiveness (RAUCH 2009, p. 153).

According to RAUCH, it is important to reach more stable economic frameworks for poor countries (RAUCH 2009, p. 158). The goal is to increase control over financial markets in order to reduce the vulnerability of poor countries to capital movements, oil prices and food prices, among others. As RAUCH points out, some authors speak of a globalization of politics and society able to deal with the globalization of markets (RAUCH 2009, p. 159). RAUCH underlines that, although few, some steps such as the increased transparency of financial transactions have already been made at the G-20 Meeting (RAUCH 2009, p. 159).

Fair trade is also a relevant instrument (RAUCH 2009, p. 162). The author explains that the fair-trade seal gives the guarantee that a product was produced and traded under appropriate monetary conditions and the observance of minimum social standards. In this sense, the contribution of critical consumers plays a key role. What we would like to suggest here is the creation of new seals for energy. These would take into account not only the main criteria of global greenhouse reduction, but other relevant criteria as well. The payment of fair leasing to locally affected landowners and investment in compensation for affected communities would be relevant criteria. Once again, the role of well informed consumers is very important.

## **6 Final considerations**

Firstly, we have analyzed the global context of supportive policies for the renewable energy sector in general. Then we have looked at the Brazilian wind policies, goals and instruments. Furthermore the northeast regional policy for wind power has been examined. Finally the local context was considered, with its actors and issues that refer to regional, national and global levels again. The multilevel approach of RAUCH (2009, pp. 119-204) gave us some clues of possible instruments that could be adapted to the Brazilian context, in order to approximate the development of the Brazilian wind branch to poverty oriented sustainable development.

What becomes evident is that, at the global level, policies for renewable energy have mainly the economic purpose of reducing dependency on fossil resources and the ecological purpose of reducing global and national greenhouse gas emissions. They do not grant that renewable energy exploitation: 1) will have little local environmental impact; 2) will not locally contribute to the aggravation of climate changes; 3) will bring local development.

At national level the main goal is economic, pursuing the security of energy supply (including protection against oil high prices and scarcity) and the development of national industry. There is also an ecological goal, which is to reduce national greenhouse gas emissions. The national government has implemented a regulation system to protect the

interests of more powerful economic actors who are investing in a centralized model of energy production. Due to a lack of compensation policies and participation processes, economic advantages do not reach underprivileged populations living in the areas of wind projects.

Regionally, the main goal is economic aiming to reduce energy import, to attract investments and taxes, to develop regional industry and infrastructure and to increase employment. The social goal of improving the living conditions of the population has not been pursued by targeted programs related to the impact of wind exploitation. Therefore, only bigger firms and skilled workers have been privileged. The ecological goal has, also at this level, been limited to the reduction of greenhouse gas emissions. An effective sustainable project for the wind branch has not been undertaken by the regional environmental institutions.

As far as this incipient analysis has revealed, until now the local administration has been limiting its action to the facilitation of the implementation of the government's national and regional prescriptions. No development policies accompanying the arrival of wind power plants have so far been observed. Meetings between wind firms and stakeholders are prescribed by the federal law for environmental licenses. Nevertheless, this usually does not lead to any resolutions that effectively mitigate or avoid the impact of the parks on the living conditions of underprivileged groups.

Some reasons for this may be, as proposed by ACSELRAD, the inefficiency of environmental institutions, the limited power of the inhabitants to represent their interests (ACSELRAD 2010, p. 109), or the lack of a targeted development policy drafted for the support of the wind branch at all levels. Such policies should cover economic, ecological, institutional and socio-cultural aspects of the regions and sites – considering people's livelihood and setting target groups of underprivileged people, who usually are those most affected by the negative effects of wind projects.

Based on our case-study, we affirm that for the Cumbe community in particular, and in Brazil in general, the management of the wind energy sector requires higher commitment to social and environmental issues. As the approach of political ecology elucidates, a main way of achieving this is to analyze the multi-scale mechanisms producing and/or increasing economic and environmental injustice, by bringing relevant instruments of economic and environmental regulation into a critical discussion – trying at the same time, as we did here, to point out some alternative instruments applying to all scales.

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## **Regionalism and Sub-National Governance in the Context of Natural Resource Abundance: the Case of the East Bolivian Lowlands**

Hanneke van der Heijden<sup>1</sup> (Amsterdam)

### **Abstract**

This paper analyses the dynamics between regionalist sentiments and (sub-) national governance in a natural resource abundant region. Within the broad theoretical base of the natural resource curse, a concentration of natural resources in a particular region of a country is thought to trigger regionalist sentiment and, worse, regionalist conflict. The literature focuses mainly on cases of complete secession, obtained or pursued through a violent path of civil war. However, instead of merely focusing on the various traps posed by natural resource abundance, this contribution seeks for a more open approach, assessing the role of natural resources beyond the deterministic notion of countries that are either “cursed” with bad natural resource management or “blessed” with a good one. This paper aims to show there are more “shades of grey” of natural resource fueled regionalist conflict, by presenting the case study of the political conflict in the gas rich east Bolivian lowlands, based on interviews conducted during fieldwork in April and May 2010 in La Paz and Santa Cruz de la Sierra. Furthermore, it aims to go beyond analyzing merely the “rebel point of view” of how regional parties shape and pursue their regionalist claims by including the dynamics between these regional actors and the central government. It therefore takes the recent decentralization policies into account<sup>2</sup>.

### **1 Introduction**

The theorization of the natural resource curse took off when scholars came to the conclusion that an abundance of natural resources could be a mixed blessing or, worse, an outright disaster for a country’s economic development. This paper starts by presenting some of the main implications of this “curse” on economic performance, and how this has played a role in Bolivia. After analyzing the economic challenges of natural resource wealth in the country, this paper precedes with the implications for social and political stability and particularly regionalist conflict, connecting the theoretical framework to the Bolivian case and empirical findings. Bolivia has many natural resources, and at least two

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<sup>2</sup> Any conclusions regarding the analyses of the current wave of decentralization in Bolivia are preliminary, for the decentralization reforms are recently installed and will need more empirical evidence.

of these could play a leading role in the regionalist conflict analyzed here. This contribution however, focuses on one of these, the natural gas reserves. The natural gas sector makes for the country's largest sum of export income. It is a strategic resource and has therefore great significance for the state, while simultaneously it has played an important role in the staggering development of the eastern lowlands, through the unequal distribution of revenues.

As a multicultural country characterized by large internal inequalities, Bolivia has a long history of ethnically based and class related tensions. Even though there have been various struggles and mobilizations of indigenous groups – together forming the majority of the country's population (approximately 62%<sup>3</sup>) – various conservative European and mestizo<sup>4</sup> elites throughout the country have dominated the political domain ever since Bolivia's independence. No ethnic party accomplished real political success until the late 1990s, and the victory of the Movimiento al Socialismo (MAS) in the 2005 elections made Evo Morales the first Bolivian president of indigenous descent. With his appointment, far-reaching policy changes were introduced, which prompted a turning point in Bolivian politics. Just three months into office Morales nationalized the exploration, extraction and transportation of the country's natural gas reserves. And quite soon, other important policy changes followed, such as land reforms in the agricultural sector and the development of a new constitution, all accompanied by a discourse of multiculturalism. The discourse of ethnic-politics dates back from the 1952 Revolution but it was not until the indigenous mobilization in the 1990s that ethnic and cultural claims started to play a crucial role in national politics, of which the success of the cultural-political discourse of the MAS is a clear example. These significant changes in the country's political arena brought new tensions to the table, stressing the division between the departments of the western highlands – the more traditional, conservative and socialist oriented indigenous majority in the altiplano<sup>5</sup> – and the departments in the eastern lowlands, with a more progressive, “western-oriented” attitude, following a capitalist and neo-liberal economic agenda (BILBAO and MURILLIO DE LA VIEJA 2008, p. 15).

Discontent about the administrative and economic policy changes, combined with a revival of regional cultural identities stimulated the demands for departmental autonomy in the eastern departments of Santa Cruz, Pando, Beni and Tarija, also known as the “Media Luna” – the half moon of Bolivia<sup>6</sup>. The four departments in the eastern lowlands form an important backbone of Bolivia's economy; disposing over a productive agricu-

3 Indigenous population above age 15, based on the 2001 census Censo Nacional de Población y Vivienda (VAN COTT 2005, p. 51).

4 Mestizo is a common name for people of mixed European and indigenous descent.

5 Altiplano is a common name for the highlands of the Andes in west-central South America. In Bolivia the altiplano is formed by the departments of La Paz, Cochabamba, Oruro, Potosi and partially Chuquisaca.

6 Media Luna is a commonly used term for the four eastern departments, together forming the shape of a half moon. However, the term is somewhat misleading for it presents this region as a unified and homogenous, while it is in fact a much diversified region. Powerful oppositions in the Media Luna departments however have bundled their strength

ltural sector and the largest natural gas sites. Announced agricultural land reforms and the nationalization of the natural gas sector threatened the interests of the political and economically powerful elites in these departments. Elites can be defined as an organized minority politically dominant over the unorganized and impotent mass, supporting each other through networks of clientalism and based on economic, social and personal interests (PLATA QUISPE 2008, pp. 104-5). This paper focuses solely on the elites in the eastern department. This does not mean however that the conservative Andean elites have no influence in contesting the government as an opposition group (KOHL 2010, p. 119). However, not only the economic and political influential elites opposed the government reforms. Opposition was also strong among lowland indigenous groups, such as the Guaraní and the Chiquitano. Elites and non-elites both felt excluded by the cultural-political discourse of the central government, mainly dominated by altiplano indigenous symbols and vocabulary, directed at the political empowerment and inclusion of Andean indigenous communities. Neither elites nor lowland indigenous communities felt represented by this political discourse, sharing little cultural similarities with highland indigenous groups. Cultural motivations for increasing opposition towards the central government were based on the discourse of regional identity: *cambas* (European and mestizo population) versus *collas* (indigenous campesinos<sup>7</sup>).

This contribution concentrates on the regionalist demands as expressed by the economic and political elites in the Media Luna. Thanks to the various preferential policies and the constant channeling of resources towards the lowlands and Santa Cruz in particular, the economic growth in the department far outpaced growth rates for the national economy during the 1970s (EATON 2007, p. 79; BARRAGÁN 2008, p. 13). This new economic elite had great political influence as well. Apart from the agricultural production, the central state did not have much interest in the governance of the eastern departments. This left much space for the relative well-to-do landowners to set their own political agenda (author's interview with assessor at the Ministry of Autonomy, La Paz, 29 Apr 2010). The recent plea for autonomy of these economic and political elites has been the most forward and successful, and has triggered a strong response from the national government and the international community. This paper does not merely look at the autonomy demands of the elites in the Media Luna, but also analyses the efforts of the central government to deal with the regionalist pressures. The process of autonomy has not been a static one-sided endeavor, but an interesting dynamic between the regionalist movement and central government.

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into a political coalition. Therefore, the term Media Luna is used in this paper to indicate the political cooperation between these departments.

7 Campesino is a common name for indigenous peasants, especially in the western highlands.

## **2 The natural resource curse in Bolivia**

Since the 1980s it became clear that an abundance of natural resources, instead of being advantageous for economic and industrial development, could also have a negative impact on economic performance (ROSSER 2006). Natural resource abundant countries are inclined to concentrate their financial income predominantly on the export of these primary commodities. Particular in cases of state-ownership over natural resource reserves and revenues, this dominance of the export sector can disadvantage a country's economic performance. The "easy money" derived from natural resource export makes governments less dependent on the development and efficiency of the domestic market; known as a rentier state. To compensate for the large exports, import figures are usually also high. Besides, a lack of economic diversification makes a country's economy very fragile; the concentration on one economic sector increases the vulnerability for booms and busts of the global market economy – Dutch disease (SACHS and WARNER 1997).

Since the colonization by Spain, Bolivia's main economic venture has been the exportation of various natural resources, from rubber, tin, silver and gold to soy, coca and natural gas. These natural resources have affected Bolivia in its regional and domestic political stability and quality of governance. The natural richness has stalled economic performance and paralyzed the development of the domestic market. In the mid-nineties new gas fields were discovered in south and east Bolivia, and the country's estimated reserves went up with about 87%. This discovery was a result of the privatization of the natural gas sector in 1994. With the capitalization<sup>8</sup> of Bolivia's oil and gas company, the exploration and production of natural gas increased gradually, affecting the number of gas fields and estimation figures of the gas reserves. Not concerned about national strategic and future use of the natural gas, the international companies stimulated a tremendous production growth of natural gas, leading to a production- and export boom from 2000 onwards (author's interview with hydrocarbon consultant, La Paz, 13 May 2010). Despite the economic risks, Bolivia still depends heavily on the export of primary commodities (Figure 1), of which the natural gas sector is the largest<sup>9</sup> (Figure 2).

Not only did this boom of natural gas extraction contribute to the continuation of Bolivia's economic dependence on export figures, it also affected internal equality. The neo-liberal policies regulating the capitalization of the natural gas granted the multinational corporations in control of the gas production a large share of the profits. The government merely received 18% of royalties, collected 16% tax and took hardly any profits (author's interview with energy specialist IDEA International, La Paz, 27 Apr 2010). A staggering 11%

<sup>8</sup> In Bolivia, "capitalization" is a commonly used term for privatization.

<sup>9</sup> The natural gas sector is somewhat less vulnerable for changing world prices, because export volumes are fixed in long term contracts (ANDERSEN et al. 2004, p. 3). Nonetheless, the revenues are still sensitive to the development of fuel oil prices. These fixed contracts and the fact that there are only few potential buyers also makes the market less flexible (ANDERSEN and MEZA 2001).

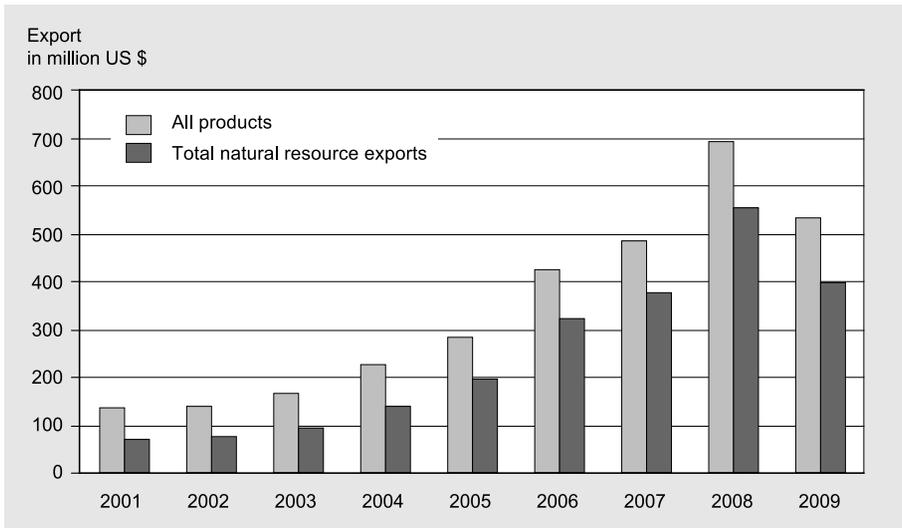


Figure 1: Bolivia's natural resource export

Source: Author's elaboration based on International Trade Centre statistics (International Trade Centre 2011)

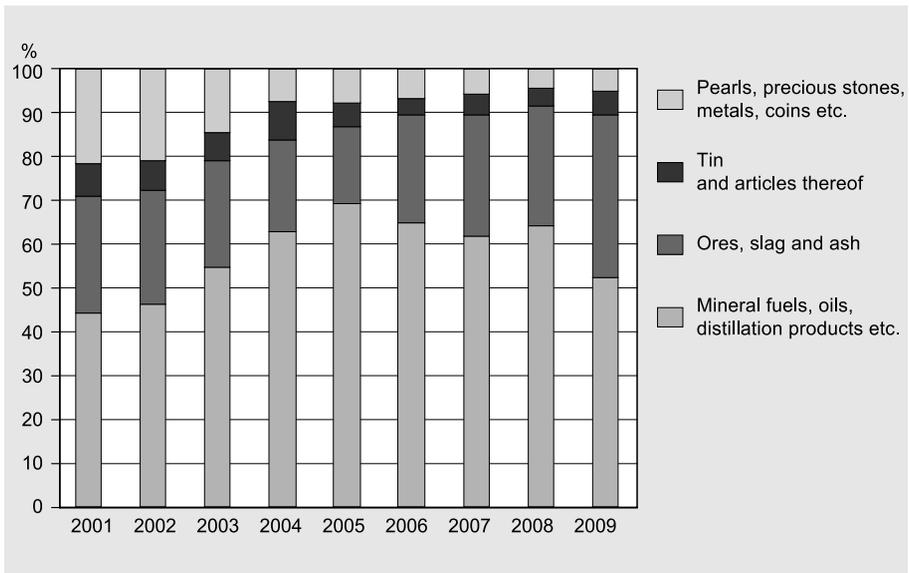


Figure 2: Share of natural gas export

Source: Author's elaboration based on International Trade Centre statistics (International Trade Centre 2011)

of the government's share went straight to the four producing departments<sup>10</sup>. To level this distribution of royalties between producing and non-producing departments, a special tax was implemented; the IEHD tax<sup>11</sup>. However, the IEHD tax stimulated a different type of inequality, namely within the departments. 80% of the departmental share of the IEHD tax was allocated to the departmental level, assuming the departments' responsibility for redistribution of these financial resources among the municipals within the department. Municipal governments worried that the internal distribution would not be fair, favoring the department's capital city over other municipals.

However, not the unequal distribution of the natural gas revenues but the intended plans to build pipelines through Chile to reach the Pacific Ocean and start exporting to the United States, led to a popular discontent about the natural gas management in 2000. Violent confrontations between protesters and Bolivian armed forces – also known as the Gas War – led to the resignation of president Sanchez de Lozada in October 2003. That was the beginning of a political and social unstable period, in which two (interim) governments, of Carlos Mesa and Eduardo Rodriguez, could not stand the pressure of an increasingly strong opposition, led by the MAS. As a result, the Mesa government issued a public referendum on the future of the natural gas reserves in 2004 and a year later, during Rodriguez' term, a new Hydrocarbons Law was implemented. With this law, an additional tax was created, to generate more direct domestic benefits from the natural gas production and to level the regional inequalities from natural gas revenues. This tax, Impuesto Directo a los Hidrocarburos (IDH), increased the taxation base of the natural gas sector from 18 to 32%, and leveled the unequal redistribution of natural gas revenues between producing and non-producing departments (AZEÑAS 2010). Nonetheless, inequality within the departments remained high because of the allocation of revenues primarily at the departmental government bodies. To decrease inequality between municipals and diminish the redistributive role of the departmental prefectures, the MAS administration adopted a Supreme Decree in 2007. So on top of the decreased direct income of the producing departments as a result of the 2005 Hydrocarbon Law, the increased municipals' share through the adaptation of the Supreme Decree even further decreased the direct funds for the departments' prefectures. Apart from these redistributive measurements, the new Hydrocarbon policies of the MAS administration, like the nationalization of the Bolivian gas reserves, also had a symbolic nature. Morales used the results of the 2004 referendum, executed during the Mesa administration, on the future use of country's gas reserves to justify this nationalization (SCHROEDER 2007, p. 110).

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10 The high share of royalties for the producing departments has its origin in the 1938 Ley Bush, in which 11% of the oil production was in favor of the producing departments (LASERNA 2009, p. 32). This was the result of the pressure and lobby of a powerful opposition movement in Santa Cruz (Ibid).

11 Special Tax for Hydrocarbons and Derivatives; this tax was an initiative during the privatization process of the natural gas sector and was meant to stimulate the commercialization of natural gas on the domestic market. The IEHD tax also created a financial buffer to protect the internal market from fluctuations of international market prices (ESPADA 2009, p. 30).

The act of nationalization was broadly supported among the Bolivian people because of the disappointing results of the neo-liberal economic policies and the symbolic meaning and communal ownership of natural resources of the country. It was seen as a “political measure to eliminate an excess of power of foreign investors over the state” (MIRANDA 2008, p. 178). A clear example of this is the case Tarija, the most productive department in natural gas production in south east Bolivia. The gas reserves are divided into four main gas fields: Margarita, San Alberto, Itaú and San Antonio, and are located in the east of the department, part of the Chaco region; a traditional region of the Guaraní spread over the departments of Tarija, Santa Cruz and Chuquisaca (PERRAULT 2008, p. 9). Tarija’s capital is located in the west of the department, in the small province Cercado. The most productive municipals are located in the eastern part of the department, in the Chaco region, such as Villamontes and Yacuiba. However, over the years these municipals felt mistreated and financially disadvantaged by the department’s capital, which got extremely rich because of the gas production in their municipals (author’s interview with technical and regional coordinator DED, Santa Cruz de la Sierra, 3 May 2010). However, even though the distribution within the departments takes the number of inhabitants into account, the distribution between the departments remains a calculation in absolute terms. This means that there is a very unequal distribution of revenues between densely and sparsely populated departments if calculated per capita. The neo-liberal policies in the natural gas sector were accompanied by high expectations about bringing wealth and prosperity to Bolivia. Not only would opening up the market attract Foreign Direct Investments (FDI), but private corporations were thought to be much more efficient and less corrupt in handling natural resource management than state companies. The disappointment was great when these expectations were not met (author’s interview with hydrocarbon consultant, La Paz, 13 May 2010).

### **3 Natural resources and regionalist conflict**

Soon after the theorization of the impact of natural resource abundance on economic performance, scholars started exploring the influence of natural resource wealth on other aspects of society, such as the likelihood for and the power of authoritarian regimes and the risk for social instability. Particularly economic driven greed (COLLIER 2000) or grievances of marginalized groups over bad natural resource management (BALLENTINE and NITZSCHKE 2003) are likely causes for the outbreak of conflict. “There is strong evidence that resource wealth has made conflict more likely to occur, last longer and produce more casualties when it does occur” (ROSS 2004, p. 61). A particular kind of conflict triggered by natural resource wealth is separatism; a conflict over the ownership of a regionally concentrated natural resource between the central government and a regionalist movement. Well known cases such as Aceh (Indonesia), Cabinda (Angola) and southern Sudan, demonstrate regionalist resource conflicts characterized by high levels of violence between state and non-state actors, fighting for either absolute control over resource extrac-

tion or a complete secession of the state. However, not all regionalist resource conflicts can be explained in such absolute terms.

Before the MAS administration, the elites in the eastern lowlands had major influence in central politics. “Throughout the political volatility of the 1960s, ‘70s, and ‘80s, support for either a change of government or change of regime in La Paz (...) was the consistent response by Santa Cruz elites to national governments they did not like” (EATON 2007, p. 78). The presidential term of Banzer (1971-1978) can even be seen as a direct representation and guarantee of the region’s interests through the national government. However, since the popular break-through of the MAS, all traditional, established political parties<sup>12</sup> have lost influence, which accounted for a direct threat to political and economic interests of the elites in Santa Cruz. This explains in part the sudden “quest for autonomy” in the eastern lowlands; the elites were no longer able to exercise their political influence through the institutions in La Paz, because of the “collapse of elite-led party system” (GUSTAFSON 2009, p. 986). Formerly, Bolivian democracy was so fragmented that coalitions were needed to form a majority in the Assembly. With the absolute success of the MAS as a majority party, negotiations with other political parties were no longer needed, and it could govern as single party administration. This has increased the sentiment of “political loss” in the eastern departments; “economic elites in Santa Cruz do not perceive their loss of voice in the national government to be a temporary matter and believe instead that the defense of their interests now requires some sort of autonomy from that government” (EATON 2007, p. 83). The quest for autonomy can therefore be interpreted as a form of resistance to the left-indigenous political power (WEBBER 2008, p. 92).

Despite the increasing social and political tension and polarization between 2006 and 2008, the regionalist demands in the eastern lowlands did not lead to “separatist violence”. The kind of self-governance proposed by the opposition in the Media Luna was “regional autonomy” to increase departments’ administrative, financial and juridical authority; political decentralization at departmental level, and regional control over natural resources, the right to retain control over two-thirds of all tax revenues generated in the department and authority to set all policies other than defense, currency, tariffs and foreign relations (EATON 2007, p. 74). These autonomy demands were maximalist in character, for they claim control over the state’s two major strategic and ideologically charged domains: natural resources and territory (PLATA QUISPE 2008, p. 161 and author’s interview with regional director Fundación Tierra, Santa Cruz de la Sierra, 5 May 2010). This far reaching form of autonomy would have significant impact on the influence of the central government. It could also have a negative impact on local equalities, for it provides little redistributive means to smaller sub-national entities such as municipals and indigenous

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<sup>12</sup> Such as the *Acción Democrática Nacionalista* (AND), *Movimiento de Izquierda Revolucionaria* (MIR) and *Movimiento Nacionalista Revolucionario* (MNR).

communities (EATON 2007, p. 74, and author's interview with professor of sociology at Universidad Autonoma Gabriel Rene Moreno, Santa Cruz de la Sierra, 7 May 2010).

This type of autonomy can be seen as a federalist form of decentralization (author's interview with project coordinator democratic governance, UNDP, La Paz, 11 May 2010). However, the plea for greater regional power was expressed particularly in terms of "autonomy" instead of "decentralization". This can be explained by a wish to disassociate the intended regional reforms with former acts of decentralization. In the mid-nineties decentralization policies were introduced during Sánchez de Lozada's Plan de todos; a sweeping reform package that affected nearly every facet of the state. Two important administrative reforms were the 1994 Ley de Participación Popular<sup>13</sup> (LPP) and the 1995 Ley de Descentralización Administrativa<sup>14</sup> (LDA). The LPP created more than 250 new sub-national governments at the municipal level, transferring 20% of the national tax revenues to the municipalities and various administrative responsibilities (KOHL 2003, p. 156). The most significant consequence of the LPP was the political recognition and inclusion of indigenous communities; it gave way for the foundation of many indigenous organizations and indigenous political parties.

The LDA on the other hand lacked this political decentralization, for the officials at the departmental level were still appointed by the central government. Departmental policy-making remained a reflection of the agenda of the central state. Despite the transfer of finances to the municipalities, the departmental budgets remained large as well, particularly those departments that benefited excessively from the natural gas revenues. Decentralization reforms do not necessarily account for the increase of power at the local level, and thus the decrease of central power (FALLETTI 2005, p. 327). Indeed, it seems if Sánchez de Lozada aimed to uphold the centralized political structure of the state (KOHL 2003, p. 344). "Although the model of [popular] participation has a decentralizing dimension, it is so marginal and dispersed that we can anticipate that the final result will be greater centralization (LASERNA in KOHL 2003, p. 344). However, with his eye on the economic interests Sánchez de Lozada underestimated the impact of particularly the LPP on strengthening the civil society and indigenous mobilization in the mid-nineties. It provided the tools for the mobilization of a successful opposition against the country's dominant neoliberal political and economic order (PERRAULT 2008, p. 7), of which the 2000 water war in Cochabamba and the 2003 Gas War are clear examples.

Clearly, these decentralization reforms of the nineties were not the kind of self-governance the political and economic elites in the eastern departments proposed themselves. The LPP granted most local power to municipalities, while the LDA kept the depart-

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13 Law of Popular Participation

14 Law of Administrative Decentralisation

mental power limited, particularly because of the lack of departmental representation (author's interview with former governor to Santa Cruz' departmental assembly, Santa Cruz de la Sierra, 4 May 2010). Instead, the Media Luna elites proposed a form of self-governance with the department at the center of sub-national power. Therefore, the Media Luna elites were reluctant to adopt this same term; "the equation of decentralization with municipalization encouraged the Pro-Santa Cruz Committee to embrace "autonomy" as its goal and to dismiss "decentralization" as something that had already taken place in Bolivia" (EATON 2007, p. 80).

In the literature on the natural resource curse, it is common to use "secession" when analyzing regionalist resource conflict. All possible different forms of "the search for greater self-government" are put together under the label of secessionist movements (COLLIER and HOFFLER 2002; FEARON 2004; ASPINALL 2007). While secession refers to a very narrow, specific meaning of "a demand for formal withdrawal from a central political authority" (WOOD 1981, p. 110), separatism, in contrast, refers to a wider understanding of a demand for regional autonomy or provincial rights. The most important difference between the two concepts, however, is the acceptance or non-acceptance of the central government as political authority. Separatist movements are still willing to cooperate with the central government, whereas secessionist movements struggle for their own sovereignty, in the form of an independent state. This is the distinction between political integration and disintegration, whereby secession is disintegrative in a fundamental way, for it is the "dismemberment of a territorial state" (Ibid, p. 112). Political integration on the other hand incorporates different political actors, activities and systems under the jurisdiction of one political center.

Indeed in the Bolivian case, the regionalist demands were a proposal for greater self-government within the existing political sovereignty of the Bolivian state<sup>15</sup>. Secession has never been a realistic option. Even though Santa Cruz alone is responsible for 40% of Bolivia's export and 42% of its tax revenue (WEBBER 2008, p. 88), it highly depends on the western highlands for the domestic market. Except for the city of Santa Cruz de la Sierra, the Media Luna region has a low population density; the majority of cities and large communities are in the western highlands. So economically, the two regions are highly interdependent and could not survive on their own (author's interview with former governor to Santa Cruz' departmental assembly, Santa Cruz de la Sierra, 4 May 2010, and interview with project coordinator conflict and resources, Fundación Puente Entre Culturas, Santa Cruz de la Sierra, 5 May 2010). Subsequently, secession would not be a very realistic option because neighboring countries would not support nor recognize the Media Luna as a separate state. All South American governments supported the central government of Bolivia during this regional conflict in 2008 (author's interviews with en-

15 However, some radical right-wing civil society groups, such as Nación Camba and Unión Juvenil Cruceñista (Santa Cruz youth movement of the Civic Committee), did use a discourse of separatist claims.

ergy specialist IDEA International, La Paz, 27 Apr 2010). In September 2008 the member states of the UNASUR came together in Santiago de Chile, expressing their support of Morales' government in the Declaración de la Moneda. In this official declaration the member states express their condemnation of the violence and rejection of the rupture of the institutional order and the territorial integrity of the Bolivian Republic.

#### **4 Regionalist conflict: motivated by greed or grievances?**

Separatist demands are frequently described in terms of economic motivations (Paul Collier, among others). However, these economic agendas are often blurred, intertwined or complemented by feelings of injustice; the interaction between greed and grievances. Greed is rent- or loot-seeking behavior of actors in conflict, emphasizing on the importance of economic agendas as motives for the offset of civil wars. Greedy actors can be both conflict entrepreneurs, driven by personal gain as well as conflict opportunists, who profit from the opportunity posed by conflict (JACKSON 2005). Grievance, on the other hand, is the discourse of a justice-seeking approach, to correct feelings of historical marginalization, economic inequality, political oppression or ethnic or religious discrimination of a specific group in society. Grievances can be the result of inadequate or discriminative resource management, through an uneven distribution of resource revenues, affected livelihoods by extraction industries, wrongful ownership and a demand for traditional land use rights. The actual mobilization within resource rich regions is usually framed in terms of shared history and common identity in the region. "Resource extraction will trigger conflict only if an appropriate collective action frame exists in the cultural toolkit of the group in question" (ASPINALL 2007, p. 951). Collective action lies in the notion of belonging to an imagined community, based on social, cultural, religious background and sharing symbols of this identity such as language and history (ANDERSON 1991).

There exists indeed a geographical and cultural distinction between east and west Bolivia; the western indigenous and traditional highlands versus the gas rich mestizo/white lowlands in the east. However, this distinction is not as definite as is often made to believe. In both east and west Bolivia there is a high level of ethnic diversity. However, both regions experienced different modes and paces of development, have attracted different types of economic production and investments and have different cultural traditions. In the mid-nineties, the cultural mobilization of various indigenous communities in Bolivia began to have unprecedented success, followed by the popularity of Aymara coca-union leader Evo Morales and the powerful cultural discourse in his political campaign. As a response to this "ethnic-politics", the economic and political elite in the Media Luna started to adopt similar cultural vocabulary as was used during the indigenous cultural mobilization, to frame and support their own plea for autonomy. With the adoption of this cultural frame, the quest for autonomy was no longer solely about natural gas (and agricultural

land), but also about cultural and regional identity (FRENCKEN 2010), strengthened by feelings of alienation by the Andean-indigenous politics and symbolism of the central government (author's interview with former governor to Santa Cruz' departmental assembly, Santa Cruz de la Sierra, 4 May 2010). In this context, the opposition in the eastern lowlands gave a new twist to the government's plural-national discourse by "imagining that interculturalism meant that all Bolivians had ethnic particularity and indigenous-like autonomy rights" (GUSTAFSON 2009, p. 994). The cultural discourse of the autonomy movement – particularly the right-wing civil society groups Comité Civico and Nación Camba – has not only adapted elements from the Andean indigenous movements but also got inspired by national liberation movements abroad (ASSIES 2006, p. 99).

The cultural discourse of the two Bolivia's – *camba* versus *colla* – was intensified by the use and misuse of national and regional media. Both the central government as well as the opposition in the eastern lowlands supported media outlets and used news media to gain support for their cause. The central government had received about 2 million US dollar from Venezuela to invest in a government media network of more than 20 community radio stations (CPJ 2009). The economic and political elites in the Media Luna on the other hand, owned or significantly influenced local media. In Tarija for example, the local media provided a steady stream of pro-autonomy, pro strike analysis. The opposition press, controlled by elite interests, "played an important role in cultivating grievance and celebrating regional identity prior to and during this strike" (HUMPHREYS BEBBINGTON and BEBBINGTON 2010). Both sides used the media in deepening their power struggle, resulting in biased news broadcasting (Human Rights Watch 2010) and contributing to increasing social tensions and polarization (author's interview with sociologist and political analyst CEJIS, Santa Cruz de la Sierra, 7 May 2010).

However, motives of economic interests and political control remained strong. "A major obstacle to their efforts is the widespread perception that they are merely seeking to defend their own specific economic interests. To counter this perception, economic elites have sought to repackage their narrow sectoral demands as broader geographic or territorial demands" (EATON 2007, p. 85). The idea of "being different" from the rest of Bolivian society proved to be a very powerful political weapon in the struggle for autonomy, and gives way for the emergence of new feelings of regionalism in Santa Cruz and the Media Luna (PLATA QUISPE 2008, p. 163). Packaging these feelings for greater autonomy in a frame of shared identity stimulated the political mobilization of the support for autonomy in the eastern departments, legitimizing and strengthening the opposition. This is known as politicized collective identity (SIMON and KLANDERMANS 2001); shared identity for a political purpose. In Bolivia however, this politicized collective identity in the Media Luna's quest for autonomy is shaped differently than normally in the "grievance" debate; because in this case it does not concern a marginalized social or ethnic group. Rather, the group seeking more autonomy and control over natural resources, the elites in the eastern

lowlands, had significant influence in Bolivia's politics. The stereotyping of the "self" and "other" therefore does not go through claims of historical repression, exploitation and exclusion. In the creation of the "other" – the colla – the autonomy movement and their supporters express their feelings of unjustness in terms of diminishing profits of the region's economic activity (fBDM Informe Especial 2010, pp. 32-33).

In this regard, the grievance aspect of the Media Luna elites' discourse for autonomy could be seen as a strategy to legitimize "greedy motivations". "Regional identities are viewed as being functional to elite efforts to control resources and continue to dominate regional political economy and society" (HUMPHREYS BEBBINGTON and BEBBINGTON 2010). Because of their functional character, these identities can be part of a consciously cultivated "invention of tradition". The invention of tradition is when practices and symbols attempt to establish continuity with the past, but are in part invented and transform the "tradition" (HOBBSAWM 1983). However, this kind of invention of tradition does not occur in a historical vacuum, but is based on a given geographical and historical context (HUMPHREYS BEBBINGTON and BEBBINGTON 2010) in which identities are not simply created from scratch but rather evolve over time. The country's natural resource wealth has been little beneficiary for the Bolivian population and bad natural resource management has contributed to regional disparities. Even though the Media Luna elites seem less directly disadvantaged, these popular grievances about natural resource exploitation have shaped and influenced their interpretation of recent political changes; "grievances related to these adverse effects of resource extraction have been part of this emergence of identities" (Ibid). So, even though grievances might not play a straightforward role in the Media Luna elite's quest for autonomy, historical and national feelings about bad natural resource management have made an appropriate and recognizable frame, which had part in shaping the demands for regional autonomy.

## **5 Choice of strategies: the political struggle for greater autonomy**

Most of the natural resource literature on conflict and separatism focuses on violent conflicts and the outbreak of (civil) war, in which concepts like "oil wars" and "blood diamonds" are frequently used. In these resource conflicts, actors and conflict entrepreneurs such as greedy outsiders – like multinational corporations –, insatiable insiders – like rebel groups or warlords – or corrupt governments, take the "price of fire"<sup>16</sup> for granted to battle for their cause. However, not all natural resource conflicts are necessarily violent in nature. Bolivia's economy is driven by neo-liberalism, with a high level of interdependency in the international economic and political system, on which Bolivia as a country and the Media Luna as a region have come to depend on. So in the international political arena, the autonomy movement has a great interest not to antagonize

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16 After BENJAMIN DANGL's "The Price of Fire; Resource Wars and Social Movements in Bolivia" (2007).

the other players by using violent and coercive means. They need the recognition of the international community, and therefore it is more likely that they would opt for a political and diplomatic route rather than a violent and coercive strategy<sup>17</sup>. However, the choice of strategies again relates to the mere fact that the group seeking greater self-government had significant economic and political power, which has given them the opportunity to take a political route. In many cases of regionalist resource conflict, the group or movement pursuing greater self-government, is politically marginalized and do not have the same means and opportunities as the east Bolivian elites to battle their cause in a “just” manner, and might turn to violence as a last resort. Hence in the case of the Media Luna elites taking this political path could be a mere consequence of their politically privileged position.

The political entrepreneurship of secessionist leaders – manipulating natural social cleavages, instigating discontent with the status quo and creating popular support for secession – are key in studying the process towards separatism (WOOD 1981, p. 123). Conflict entrepreneurs are “predatory elites who direct, deploy, or influence military strategy in order to maximize personal profit, forcefully colonizing key productive assets” (JACKSON 2005, p. 160). In the case of political rather than conflict entrepreneurs, military strategy can be substituted for political strategy, allowing different approaches for entrepreneurs other than violence. The eastern lowlands have used existing frames of regional identities and political resistance against the post neoliberal regime to find public support for their quest for autonomy. This public support was needed to legitimize and increase the influence of their – political – actions. Also, the media were used to win and mobilize support for greater autonomy. According to Wood, gaining publicity is the most important strategy for separatist and opposition movements. With publicity they seek to win support for their cause and simultaneously break down the support for the government (WOOD 1981, p. 124).

One of the clearest political strategies used by the Media Luna elite was the continuation of drafting the departmental statutes while the central government had opposed the installation of autonomy. In 2006 a national referendum had already taken place for the approval of more political autonomy for the departments. Only four departments – Santa Cruz, Beni, Tarija and Pando – voted in favor of autonomy, respectively with 72, 76, 63 and 56% of the votes. However, the national outcome of the referendum was 44% of the votes in favor of autonomy and 56% against. A simple majority was required in order for the referendum to be approved. So even though the national figures showed a “close call”

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17 This argument is based on assumptions by international relations theories, such as commercial liberalism, which focuses on the benefits of free trade and market economy towards cooperation and peaceful relations between states and non-state actors, driven by a harmony of interests and the anticipation of mutual gains (MORAVCSIK 1997). In practice however, international trade does not necessarily yield peaceful relations, of which the role of MNC's in conflict areas – such as Shell in Nigeria (oil), Drummond in Colombia (coal) and Nokia in the Democratic Republic of the Congo (coltan) – is a clear example.

and the four eastern departments came to a solid majority, the outcome of 56% of the votes opposing autonomy was enough for Morales to end the process and negotiations for autonomy. Yet the eastern departments – all calling for greater autonomy – used their regional victory as a legitimization to continue the process of drafting their departmental autonomy statutes. These statutes were approved through departmental referenda in 2008, even though the central government saw these referenda – and the statutes themselves – as unconstitutional. The fact that the referenda were held anyway can be seen as a strategy of the Media Luna departments to put the quest for autonomy back on the agenda, while the issue was dismissed in the Constituent Assembly (author's interview with sociologist and political analyst CEJIS, Santa Cruz de la Sierra, 7 May 2010). The Media Luna elites could use these overall positive results of the referenda to demonstrate the support for departmental autonomy in the region, legitimizing their plea for autonomy and mobilizing the opposition against the central government (author's interview with assessor at the Ministry of Autonomy, La Paz, 29 Apr 2010).

This mobilization of the opposition continued when the four eastern departments in favor of autonomy started to form a political alliance. Even though the individual statutes were quite different, the four departments did seek mutual support in their challenge against the central government. Opposition parties and civil society groups in the Media Luna also received some international support; US government sponsored programs of the United States Agency for Development (USAID) offered financial support by investing more than \$97 million in projects supporting regional autonomy and the opposition political parties since 2002 (GOLLINGER 2009). However, the strength and influence of the Media Luna elite should not be exaggerated; "elites blocs [were] nowhere near as stable as some of the readings of the elite politics underlying autonomist tendencies would imply" (HUMPHREYS BEBBINGTON and BEBBINGTON 2010). It did however develop in a social-political conflict and the polarity reached its zenith on 10 and 11 September 2008 with the attack on a natural gas pipeline and the violent clash between opponents and supporters in Cobija, Pando. This was a clear signal to the central government that something had to be done to prevent the outbreak of large scale conflict (International Crisis Group 2008), and in October 2008 the process of negotiation started between the government and the Media Luna opposition.

## **6 From a call for departmental autonomy to a four-level construction of decentralization**

After the first wave of decentralization with the 1994 law of popular participation, Bolivia embarks upon a new process of decentralization. The powerful discourse of autonomy and the increased social and political polarization have put sufficient pressure on the central government to start the institutionalization of new decentralization reforms. On 17 July 2010 the Legislative Assembly approved the law *Ley Marco de Autonomías y*

Descentralización (LMAD); a framework law on the regulation of sub-national autonomy, a process which came into being as a result of the country's new constitution (CPE 2009). After the negotiations between the state and the opposition in the eastern departments of Pando, Beni, Tarija and Santa Cruz in October 2009, the new constitution contained a reform of the structure and organization of the state's territory (articles 269 until 305 of the CPE), recognizing autonomy to four sub-national entities, divided into departments, regions<sup>18</sup>, municipalities and indigenous territories. Each of these autonomic levels have their own role within the wider setting of the development of the state, directed at boosting economic and social development, integration of indigenous peoples and assisting the development of rural areas (article 8 of the LMAD). These sub-national entities are organized through autonomic statutes, governed by democratically elected representation and endowed with specific or shared jurisdiction (*competencias exclusivas o compartidas*). The eastern departments designed and approved their departmental autonomy statutes before the new constitution was installed. These four departmental statutes, therefore, conceal many discrepancies with the state's constitution, especially in terms of the level and reach of self-governance by the departmental government bodies (author's interview with director fBDM, La Paz, 26 Apr 2010). Also in regard on the natural resource management, there are various discrepancies between the departmental statute of Santa Cruz and the state's new constitution and law on autonomy and decentralization. With the new law on autonomy and decentralization being approved, the content of these statutes will need to be aligned with the constitution (author's interview with hydrocarbon assessor for the departmental government of Santa Cruz, Santa Cruz de la Sierra, 5 May 2010). However, these departmental statutes are highly significant to the Media Luna elites, and their content will not be cast aside that easily (author's interview with assessor at the Ministry of Autonomy, La Paz, 29 Apr 2010).

Despite the negotiations in the fall of 2008 and consequently the concessions made by the central government, the MAS administration maintained its authority over how to give shape and meaning to the process of decentralization. This resulted in a complex organization of four different sub-national levels, all granted with some degree of autonomy. Questionable is whether or not this kind of autonomy can be considered to be a breakthrough for the Media Luna elites, because it diminishes the direct power of the department. So, instead of a victory for the Media Luna elites, the installation of this four-pillared autonomy can be seen as a strategic response of the central government to oppose the concentration of power at the departmental level, exactly where the opposition in the Media Luna had found its political strength. To prevent further political duality, the four levels of autonomy undermine the direct power and reach of the departments and their governors, resisting federal incentives of some radical opposition movements in these four departments (author's interview with assessor at the Ministry of Autonomy, La Paz, 29

<sup>18</sup> Regions can be either the provinces within the departments or crossing departmental boundaries, such as in the case of the Chaco region.

Apr 2010). With this form of autonomy, the government attempts to divide sub-national powers among various local political actors, and to prevent the formation of regional power blocs at the departmental level (author's interview with professor of sociology at the Universidad Autónoma Gabriel Rene Moreno, Santa Cruz de la Sierra, 7 May 2010).

On the other hand, this four-pillared autonomy might develop in a fragmentation of sub-national power. The four levels of autonomy in all nine departments need to engage in a struggle with the central government over the distribution of sufficient resources and authority to implement their right for autonomic local administration. The state and the regional authorities can become each other's competitors rather than each other's collaborators. "Bargaining with sub-national governments can be an arduous process: the division of oil revenues is a zero-sum game in which every state and local government wants as much as it can get, and there is no magic allocation formula that everyone will think is just" (ROSS 2003, p. 250). Subsequently, the four sub-national levels are not hierarchically organized, meaning that they share responsibility over overlapping areas on an equal base, which makes them each other's competitors over local jurisdiction (article 300.II of the CPE). Neither the CPE nor the LMAD specify the policy areas or executive powers of the four levels of autonomy, and assigning these tasks remains an interesting puzzle (author's interview with regional director Fundación Tierra, Santa Cruz de la Sierra, 5 May 2010). In this regard, political decentralization can decrease local power. The territorial division between these sub-national entities raises serious questions: the autonomy of indigenous territories frequently collides with the autonomy of municipalities and regional autonomy overlaps with departmental jurisdiction, such as the Chaco; an autonomic region spread over three departments. Which authority of autonomic sub-national government body then prevails over the other? The Bolivian term for this overlap of local jurisdiction is macro-regions. When these macro-regions for example cut across departmental boundaries, they may become regional autonomous (LMAD 2010, article 22.III). Therefore these macro-regions are disputed and form a potential risk for the unity and stability of the department (RAQUEL OTÁLORA in *La Razón* 2010). The powers at the sub-national level are so separated and fragmented that it might lead to divided sub-national governments (FALLETI 2005, p. 329).

## **7 Conclusions**

The literature on natural resource abundance and regionalism concentrates particularly on cases of absolute secession and civil war. The Bolivian case however, has demonstrated that natural resources and regionalist sentiments do not have to result in violent conflict. The regional demands in the eastern departments of the Media Luna were in part a result of the diminished power of the traditional political elites and parties. With the installation of the MAS government and the adaptation of various strategic policy reforms, the direct influence and financial benefits of the natural gas sector of these elites decreased vis-à-vis

the central state. As a result, the Media Luna elites pursued greater subnational power at the departmental level in a complex package of motivations and propositions, including profound control and jurisdiction over natural resource management and revenues.

The government responded to the increasing pressures of regionalism by installing a four layered structure of sub-national government; endowing departments, municipalities, regions and indigenous communities with an equal power base. On the one hand, the central government responded with these decentralization reforms to the pressures for greater regional autonomy, relieving social and political tensions and dealing with the state's institutional challenges. However, on the other hand, the MAS administration has found an interesting political balance between coping with these regionalist pressures while upholding a national agenda. The particular shape of decentralization reform prevents the concentration of power on merely one level of sub-national government. The concentration of power at the departmental level would have had a negative impact on the political power of smaller sub-national governments and would have paved way for "elite-capture". However, the current model of four levels of equally based sub-national bodies might result in a fragmentation of local powers, followed by a loss of their political influence and the stabilization of the power of the central state.

Analyzing both the regionalist demand of the autonomy movement in the eastern departments as well as the decentralization reforms installed by the central state provides opportunity to have a closer look at the dynamics between these two actors in the country's recent decentralization process and its continuing struggles over natural resource management. Even though there are some serious discrepancies between the subnational power proposed and pursued by the Media Luna elites and the four-pillared decentralization – the particular shape of the four subnational government bodies does not necessarily satisfy the autonomy demand of the Media Luna elites<sup>19</sup> – the social and political polarization did decrease greatly. The opposition in the Media Luna has lost quite some strength, especially because the ad hoc alliances between the departments and the various pro-autonomy groups fell apart after the violent clashes in September 2008. They lost power and credibility among their supporters, and had no other choice than to leave the matter of regional autonomy in the hands of the central government with the process towards the framework law on autonomy and decentralization (see section 4). However, these compromises with the government can be seen as a strategy of the Media Luna elite to regain strength in a later stage; *perder un poco de ganar mas* – loose a little to gain more (author's interview with project coordinator democratic governance, UNDP, La Paz, 11 May 2010).

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<sup>19</sup> For this four-pillared autonomy undermines the direct power and influence of the departments and departmental governors. Besides, the Media Luna elites' claim for greater regional influence over natural resources is not granted either. The state remains a dominant central actor and keeps absolute control over strategic, non-renewable resources.

The Bolivian government has faced and continues to face many challenges with regionalist sentiments and natural resource management. The country's economy still drives predominantly on exports and natural resource rents, regional inequalities remain high and economic policies are still not directed at sustainable development such as the development of value added production and industries. Despite the many criticisms on the MAS administration from various political corners within the country, the dynamics between opposition and state as described in this paper shows there is hope that something can be done about the paradox of plenty. It shows that even though the debate can be harsh and difficult, dialogue is possible. It shows that countries with regional inequalities and natural resource abundance are not simply prey to the natural resource curse, but can work to find the right balance.

Comparative case-studies can contribute to indicate how and why natural resource abundance and regionalism lead to conflict in one case but not in another. It can also compare strategies for revenue sharing mechanisms and decentralization, and what the effects are for the effectiveness for efficient administration and popular participation. This can lead to valuable insights for the dynamics between the two phenomena. More attention should be paid to the combination of both, for it harbors interesting theoretical intersections and relevant constructions in finding solutions for the challenges of central governments faced with pressures of regionalism and natural resource management.

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## **Regimes and Niches of the Water Supply Governance in La Paz, Bolivia**

Michael Eichholz (Bonn)

### **Abstract**

Water governance regimes in the so-called developing world are in many cases more heterogeneous than the modern central supply systems known in many western countries. In cities of the Global South, central water supply networks often serve only a small, mostly wealthy part of the urban population. On the other hand, the growing slums and informal settlements in often organize their water supply by their own on a community level. Those solutions substantially differ from the modern approach of water supply management and exist in a niche of specific ecological and social conditions. For decades, they were regarded as precarious, backward and underdeveloped by the advocates of progress and modernization. However, in times of the reflective modernity in western science and the claim for alternative concepts of progress and development from the Global South, decentralised and community based supply may have a stake in a future sustainable water management. In this context the paper presents the case of peri-urban water supply in Bolivia. Being one of the poorest countries of South America in terms of GDP but one of the richest in indigenous population and traditions, the marginalized *villas* of its cities provide various alternative ways to organize water supply. The study develops a theoretical framework based on the concepts of societal relations with nature and socio-technical transitions as well as on the theory of practice. By this, the forms of water supply in La Paz are analysed as a negotiated social practice emerging from a field of different actors with specific rationales and paradigms of water management.

### **1 Introduction**

Bolivia is regarded as one of the poorest countries in South America. With a GINI-Index of 57 in 2007 (World Bank 2012), inequality of income and living conditions is one of the highest in Latin America. Especially the big cities, as poles of economic and population growth, are fragmented and segregated along levels of income (BÄHR and JÜRGENS 2009, p. 282), but also, as heritage of the colonial past, along ethnic and class membership. With about 60% of the Bolivian population identifying themselves as indigenous (VERDESOTO and ZUAZO 2006, p. 46), this segregation is part of various spheres of public life until nowadays. The fragmentation and inequality of the society also find their expression in the access to public services and infrastructure, and thus in the provision of drinking water, too.

Access to public infrastructure in most of the so-called developed countries is based on network structures that seek to provide a universal service for all citizens at affordable but cost-covering prices. This model is aligned to modern ideas of rational management of water resources, since the 1990's supplemented with norms of ecological, social and economic sustainability, which depart from the conception of a state that guarantees equal and dignified living conditions for every citizen. Developed and implemented in Western Europe in the 19<sup>th</sup> century, this model is based on a modern understanding of citizenship and (welfare) state, as well as on the modern paradigm of domination of nature by human by means of technology.

However, the situation in the countries of the south is quite different. While state subsidized and often municipal-driven infrastructure networks mainly cover the areas inhabited by the privileged elites, the peri-urban and popular settlements often are not reached by a central service provider. According to BAKKER (2003, p. 337), in many cities of the Global South, the water infrastructure mirrors more the structure of an archipelago than of a network. Nonetheless, water being the most essential resource for life, people outside the core areas of municipal service find a way to organize their supply. Being disregarded for a long time by public and scientific attention, these solutions are generally born from the urgent necessity of the population and embedded in the social and ecologic conditions of their local setting. Their base is in most cases the neighbourhood community. Artisanal and communitarian in their character they seem to be the quite opposite to the modern vision of water supply – a reason why they have been neglected for a long time.

Infrastructure and water supply systems as hybrid geographical technologies (GRAHAM and MARVIN 2008) have been a concern of urban geography from multiple angles, focusing on exclusion and power relations (e.g. SWYNGEDOUW 2004), the transformation of the infrastructures under neoliberal institutional changes (BAKKER 2003; GRAHAM and MARVIN 2008) as well as under conditions of demographic change (MOSS 2008) and the role of users and small technological changes for the restructuring of supply regimes (FURLONG 2010), to name just a few.

The present paper ties in with some of this work in order to distinguish modern and non-modern supply models in the Bolivian city of La Paz and to develop a conceptual framework that makes transparent their underlying paradigms. The focus lies on the interrelation of these systems, their social and ecological context and the general role of infrastructure in the power relations between state and society.

The presented findings are based on the first phase of an ongoing research initiated in August 2009. The study is oriented on a social-ecological approach so that social science as well as hydrological methods and data were used. The first phase (August to November 2009) started with a review of existing literature on water management, urban geography

and anthropology in Bolivia. In the following, 22 interviews with representatives of 17 institutions of the Bolivian water sector facilitated the mapping of the relevant actors and their interaction. In a third step, the communitarian water supply systems of the hill slopes (*laderas*) in La Paz were studied using participatory methods, such as transect walks, group discussions and participatory observation on the one hand, and interviews with 34 users and operators of these systems on the other. Data on the ecological setting were obtained from the National Geo-technical service and the municipal laboratory and were complemented by own discharge measurements.

The paper is structured as follows: Succeeding this introduction, the following chapter presents the setting of the city of La Paz and its fundamental inequalities. The third chapter then describes briefly the water supply system of the La Paz/El Alto area (3.1), introduces to the physical setting of the slopes (*laderas*) of La Paz and describes the people as well as the circumstances under which they settled there (3.2). The next chapter deals with the theoretic framework of the study, which connects the concept of societal relations with nature (BRAND and GÖRG 2003) and the theory of socio-technical transitions (GEELS 2002) to systemize different supply solutions and, in a second step, social theory according to BOURDIEU (1979) to explore their underlying rationalities. Chapter 5 then discusses the forms of water supply with reference to the concept on the three levels. First, focusing on the meso-level of the dominant socio-technical regime of centralized modern water supply (5.1), then, on a micro-level that deals with alternative niche solutions under specific conditions (5.2) and thirdly, concerning general discourses and policies on water supply on a macro- or landscape level (5.3). Finally, chapter 6 gives a conclusion of the findings.

## 2 Urban inequalities: the two faces of La Paz

Fragmentation and segregation are common phenomena in Bolivian cities and date back at least to the arrival of Spanish conquistadores. In colonial times, the quarters of the ruling Spanish elites were separated from those of indigenous population often, as in La Paz, by rivers and walls. The two major revolutions of the Bolivian history, the independence from the crown in 1825 and the National Revolution of 1952, had lacked either the intention or the capacity to diminish the structural inequalities that expressed itself in differential access to wealth, education, political participation and public infrastructure. Although many physical barriers disappeared, segregation according to ethnic and social distinctions remains present in more subtle forms until the present days of the Plurinational State of Bolivia (CRESPO 2009; ANTEQUERA DURÁN 2007). This development can be observed especially in the cities of the *eje central* (central axis) of the country, La Paz-El Alto, Cochabamba and Santa Cruz, which experience an accelerated growth since 1950 (BLANES 2006, pp. 24-26). ALBÓ et al. (1981), who studied in detail the process of rural-urban migration to La Paz and the mechanisms of the migrants of catching up with

the urban life, describe the co-evolution of two parallel social spaces, two faces of the city: La Paz, the town of the traditional white, ruling elite around the old Spanish quarters, and Chuquiago, the town of the Aymara-speaking indigenous masses that reside from the Plaza San Pedro upwards to the slopes (Figure 1).

Although the ruling elites since 50 years tend to move to the residential areas in the lower and warmer South of the city, the old centre remains the place where political and economic power concentrate, the place of the government, parliament and embassies as well as of international cooperation organizations and bank and company headquarters.

The Chuquiago part, in contrast, expanded upwards (VAN LINDERT 1991, p. 448). In several waves, rural migrants filled up the remaining space of the La Paz valley, the steep hill slopes called *Laderas*, starting after the land reform in 1953 (Figure 1). The process of settlement of the slopes was in the hand of land speculators (*loteadores*) and nearly completely lacked municipal planning, especially with regard to infrastructure and supply facilities (BLANES 1999, p. 2). The legal recognition of the fast growing quarters and the land titles of the settlers lasted years if not decades. The reason behind this situation can be found in the gap between the two cities (ALBÓ et al. 1981) that expressed itself in an only sometimes hidden disinterest and incapacity of the municipal authorities to attend to necessities of the mainly indigenous population efficiently. Only when it came to elections, small and selected infrastructure projects were promised and sometimes executed.

Figure 1 shows the process of segregation in La Paz by means of two indicators. First, the percentage of adobe houses as indicator of low income areas reaches its highest values in the peripheral quarters of the city, mainly located in the steep slopes of the valley (dark colours). The percentage of indigenous migrants from the Department of La Paz, in their majority peasants from the northern Altiplano, indicates high values mainly in these quarters (hatched and dotted areas), which confirms the link between low income and high presence of indigenous population.

After the slopes were filled, the urbanization process continued on the Altiplano plateau, where the town of El Alto was growing since the 1970's with more than 9% per year (1976-1992: 9.2%; CODEPO et al. 2006, p. 15). After having reached more than 300,000 inhabitants, it was separated as an autonomous city in 1988. Nowadays El Alto is an important industrial location and hosts strategic communication and supply facilities (e.g. the international airport). Although there is an increasing concentration of wealth among the "Aymara bourgeoisie" of El Alto (POUPEAU 2009, p. 3), especially the population at its margins still lacks access to basic services.

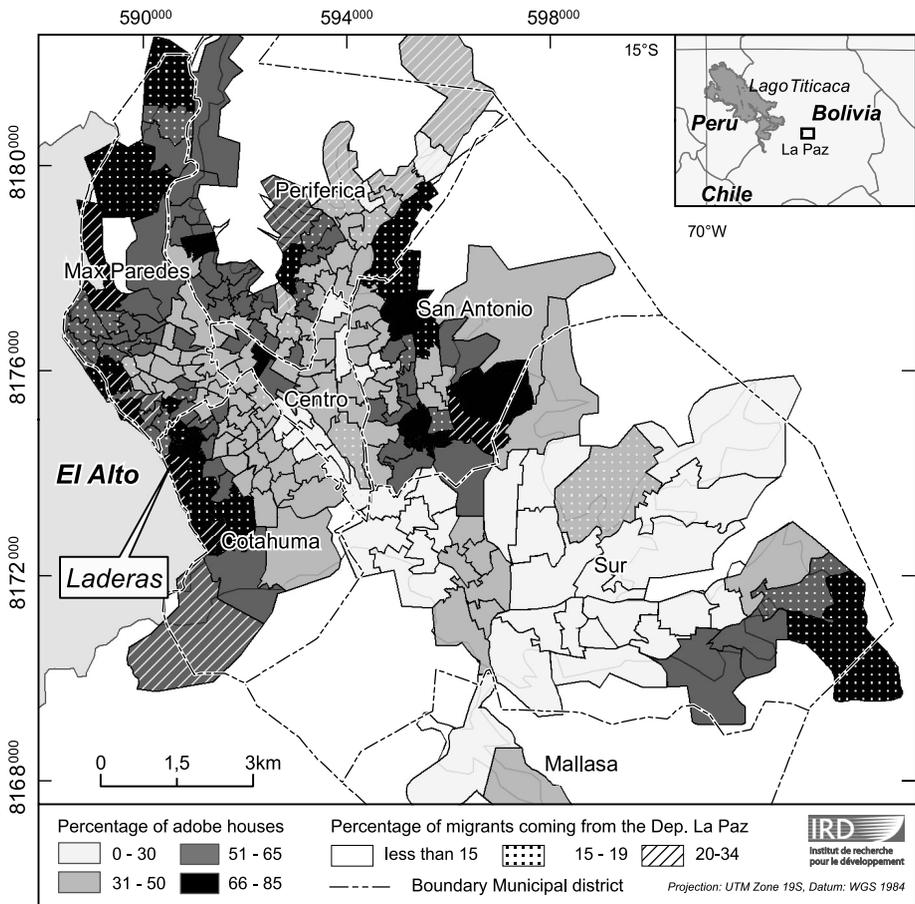


Figure 1: Socio-economic and ethnic segregation in La Paz

Source: Own draft based on data from IRD/Gobierno Municipal La Paz (Censo 2001)

### 3 The water supply of La Paz

The differences of socio-economic situations also translate to aspects of water supply (Figure 2). Although the overall coverage is quite high compared to other Bolivian and South American metropolises, especially the peri-urban and the slope (*laderas*) areas lack a domestic connection. Furthermore, the mean daily water consumption per capita reaches nearly European values in the wealthier areas (Zone Centro: 131.7 l/day/hab. and Sur: 136.9 l/day/hab.). In the following, two different forms of water supply existent in the city of La Paz are described within their social and ecological context.

### 3.1 Central water supply for La Paz

Efforts to establish a central municipal water supply company were triggered in 1965 by a Master plan made by a German consultancy. On the basis of this plan, the old tanks in the hill slopes were abandoned and new reservoirs were constructed in the East of the agglomeration in the Cordillera Real, about 20 to 30 km away from the city in adjacent municipalities. These reservoirs (currently there are nine) save water of the intense rainfalls of the wet season (November to March) as well as glacier runoff in order to release it during the dry season. The reservoirs are connected via adduction tubes to three purification plants (Figure 2) that form the basis for the three subsystems: one for El Alto and the slopes, one for the centre of La Paz and one for the southern districts of La Paz. As in recent years the reservoirs ran critically low especially at the end of the dry season, new reservoirs are currently built to increase the storage capacity. This is a result of both an increasing demand due to population growth as well as altered rainfall and glacier melt regimes due to global climate change (RAMÍREZ et al. 2007, p. 44).

Since its foundation in 1966, the municipal service company (called SAMAPA) received constant financial and technical support from international cooperation agencies and consultancies. The foreign aid consisted in the development of master plans, the design of reservoirs and network extensions as well as in formation of staff in management and

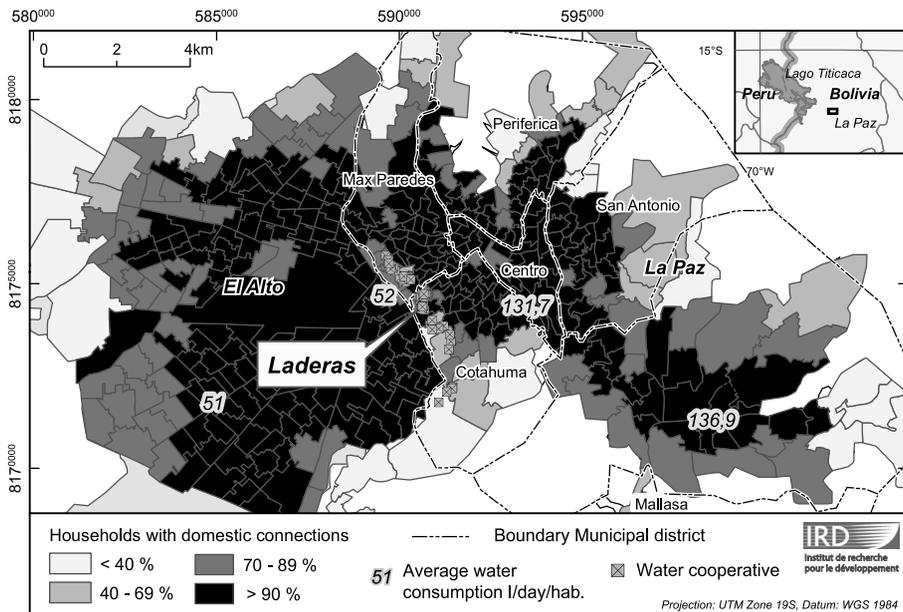


Figure 2: Water supply in La Paz – coverage and mean consumption

Source: Own draft based on data from IRD/Gobierno Municipal La Paz (Censo 2001)

technical issues (BMZ 1988). All systems are managed by one central operator, now called EPSAS, which is in charge of the production and distribution of drinking water as well of the sewage system. However, in spite of the great amount of support that the company received, several scandals of corruption and mismanagement marked the history of the public company. This situation led Bolivia's neoliberal governments of the 1990's to privatize the municipal company in 1998, hoping that private capital and management will cope with the extension of the network and end state subsidies for the company. Nevertheless, not surprisingly, the priority of the French investor was to make profit, which led to an increase in tariffs and connection fees as well as to low-cost network extension techniques not well adapted to the conditions in El Alto (LAURIE and CRESPO 2007, pp. 847-849). These measures provoked heavy protests, especially in El Alto, whose neighbourhood councils finally forced the central government to end the concession treaty with the French company in 2005. Since then, the company is de facto under the say of the municipalities of La Paz and El Alto again, and an inter-institutional commission is working on a structure for a metropolitan company. The commission is composed of members of both municipal governments, delegates of the neighbourhood councils of the cities and a representative of the Water Ministry<sup>1</sup>.

### 3.2 Alternative water supply for Chuquiago

The history of the alternative water supply systems in the hill slopes (Figure 2) is closely linked to the process of settlement of these areas. Migrants arrived to the city escaping from economic crisis in the countryside or mining areas, motivated by the vague hope for a better life but without any financial resources or familiarity with urban life. However, their expectations on improved living conditions and inclusion into the urban society were disappointed in many aspects, as for a long time, state and municipal authorities, for the above mentioned reasons, did not attend the demands of the new quarters in the slopes. In this situation, people recurred to communitarian solutions they practiced for years in their peasant communities in the Northern Altiplano of La Paz. There, the Aymara communities (called: *ayllu*) count on various social institutions for communitarian problem solving. Fundamental decisions are made in a general assembly of all households, which is chaired in rotative order by every member of the community. Furthermore, reciprocity is one of the main pillars of the Aymara communities. Common tasks such as irrigation or flood protection infrastructure are carried out by all community members in common work actions (*faena*) (ALBÓ and RAMON V. 1994). Thus, the rural migrants that arrived to the slopes of La Paz, although left alone by the municipal and state authorities, began to create solutions for their basic necessities relying on ancestral forms of organization. People organized their neighbourhood around one of the plenty fountains present in this

<sup>1</sup> The Water Ministry was established by the MAS-government in 2007 and staffed with people from the social organizations that led the protest against water privatization. The ministry is a symbol of the importance of the water sector for the rise of the actual government.

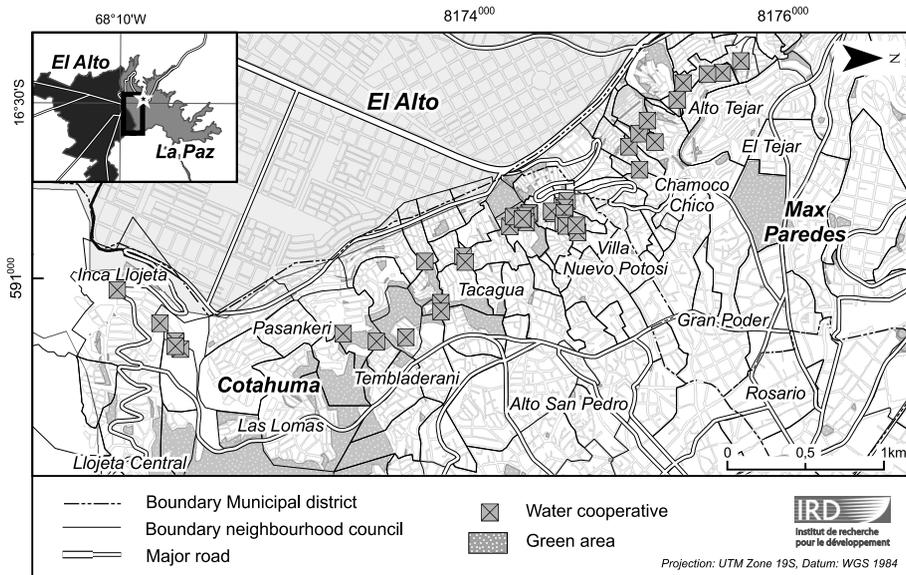


Figure 3: Overview of the communitarian water supply system in the western hill slopes of La Paz

Source: Own draft based on data from IRD/Gobierno Municipal La Paz (Censo 2001)

area, where the water was captured and stored in tanks in order to distribute it afterwards to the homes (Figure 3). Nearly all work and money was put in by the community members themselves with only sporadic support of the municipality and international cooperation. In 2010, after more than four decades, 45 water committees and cooperatives were counted along the western slopes of the La Paz valley (Figure 3, EICHHOLZ 2010, p. 27).

The average of domestic connections of the 45 water cooperatives reaches 109, with 20 being the smallest and 450 the largest number of connections. In total, the communitarian systems serve an estimated number of 23,000 inhabitants (PAS and VSB 2007, p. 21). This represents only 3-4% of the total domestic water connections in La Paz, which is a quite small part compared with other big Bolivian cities (Cochabamba: 48%, Santa Cruz: 33%; Reingeniería Total 2008, p. 8).

The water sources used by the communities of the slope consist in a multitude of fountains that emanate in the area (Figure 3). Their origin is the Pura-Pura-aquifer, located beneath the Altiplano plateau. Its flow direction is towards the Titicaca lake, however as it is cut by the slopes of the La Paz valley, the pressure decline diverts the water towards the springs at about 3900 m.a.s.l. The water is captured via filter sections caved in the soil. Water analysis showed that the quality of the water at its source is quite good (personal communication WHO, October 10, 2009). However, there is a constant risk of chemical

and bacteriological contamination through leaky or inexistent sewer pipes of the city of El Alto, located above the aquifer. Nevertheless, bacteriological contamination already is a common problem of the communitarian water systems, as many of the spring tapplings are not protected against contamination from the surface. Because of interventions by the Bolivian Red Cross in the 1990's and by the WHO since 2007, this problem is tackled by the cooperatives via drop-chlorination units, though the success of this measure varies a lot between the systems. This is due to scarce resources for buying the chlorine or operational and management failures (EICHHOLZ 2010, p. 59).

Most of the communitarian water supply systems have not changed substantially since their foundation and maintain their main characteristics: intense participation of the user in the administration, operation and decision making of the system via assemblies and communal work actions. The financial basis of the systems consists mainly in the entrance fees of on average 500 Bolivianos (~50 Euro) paid by new members. Monthly water tariffs are very low: the majority collects only 2 to 8 Bolivianos (~0.20-0.80 Euro) without measuring the quantity. Nonetheless, for most of the users prices are the main reason for being member of the committees and cooperatives. Apart from that, people value the capital and efforts invested by them or their ancestors as well as the autonomy from the central water supplier.

The legal constitution of the communitarian systems in La Paz varies. Some are connected and administered by the neighbourhood councils (*juntas vecinales*). Others are constituted as water committees, with or without registered legal personality. The majority of the communitarian systems in La Paz however are constituted as cooperatives, a form of a user-owned non-profit entity. Registered legally in the Ministry of Labour, the cooperatives are governed by a law of cooperatives, pay taxes and report balances to the national direction of cooperatives<sup>2</sup>.

Given the big number of independent systems, their conditions in terms of service quality vary. Some struggle with severe problems of water quantity and quality, which motivates some users to look for an additional connection to the central supply systems. Additionally, problems with the administration, accounting and corruption are widespread, and nearly all committees are scarce in financial resources. Notwithstanding there are as well examples of well functioning and even expanding communitarian systems, which proactively seek for support of municipal authorities and NGOs to improve their service and water quality. As the first results of this study show, the main factors for a successful water cooperative are the quantity and quality of their water source and capability of the people in charge of operating the system.

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<sup>2</sup> The cooperative model is common in the Bolivian water sector. The city of Santa Cruz may be considered as the centre of this movement, with the central water supplier being a cooperative serving more than 822,000 persons.

## 4 Conceptual framework

In the following, a conceptual framework is developed in order to analyze the above-described different ways of water supply. The concept departs from a general perspective on human-nature relations on the societal level and in a second step tries to identify the range of practices that form these relations and to discover the sense that is given to practices by different actors.

In general, human societies maintain manifold relations with their biophysical environment, shortly referred to as nature, by which human basic needs, such as eating, drinking, shelter and reproduction are satisfied. Societal relations with nature therefore can be understood as the “constitutive mediation of the societal processes with nature” (BRAND and GÖRG 2003, p. 6; BECKER and JAHN 2003). The concept focuses on processes of economic-technical and linguistic-discursive construction of nature, which in the modern (Western) tradition show a tendency towards a domination of nature (BRAND and GÖRG 2003, p. 8). For the case of water supply analyzed in this paper, this relation can be described according to HUMMEL et al. (2004, p. 2) as mediation between water resources on the natural side and water consumers at the social side. This relation is facilitated by means of technology, practices, knowledge and institutions. In reference to Marx, these means are based on societal labour and relations of production as well as on cultural symbolization, which thereby regulate the societal relations with nature. Accordingly,

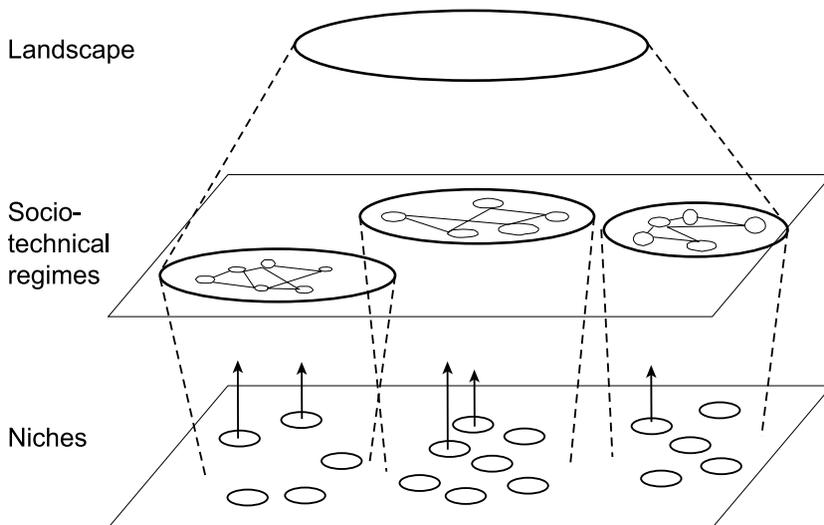


Fig. 4: Socio-technical system according to GEELS (2002), modified

Source: GEELS 2002, p. 261

the term regulation can be defined in this context as “encounter of heterogeneous social practices of different actors, which govern societal relations with nature through a mesh of institutional configurations” (HUMMEL and KLUGE 2004, p. 95, own translation)<sup>3</sup>. The process of regulation leads to a reproduction of the relations and is characterized as a “process without a steering subject” (BRAND and GÖRG 2003, p. 22).

In our case, the mediation between hydrological resources and human water usages includes a range of technologies (e.g. reservoirs, treatment plants and canal networks), practices (e.g. caption, adduction and storage of water resources) and social organisation and institutions (e.g. distribution of work and costs). By naming these activities it becomes apparent that across human history and cultures various forms of how to regulate and organize the provision have emerged (BRAND and GÖRG 2003, p. 8). As our example of the water supply regime in Bolivian cities shows, different forms, with different underlying principles, may exist in the same time and place.

For the analysis of different forms of supply systems, KONRAD et al. (2004) also conceptualize those as social-ecological systems. Furthermore, with reference to theories of technological transitions (GEELS 2002), they distinguish three different levels of social-ecological systems (Figure 4). The landscape level includes slowly-changing, external factors (basic technologies, socio-political structures, hydrological conditions). Within the landscape exist different socio-technical regimes that consist in specific configurations of social, technical and ecological elements, which are linked in order to fulfil a societal function (VOSS 2004, p. 73). Stable socio-technical regimes result in socio-technical trajectories, as engineers and firms inside them share and reproduce similar routines, ways of thinking and of solving problems (GEELS 2002, p. 260). On the micro-level, nested in the regimes, there are small niches which differ from the dominant regime configuration. Niches can be found in specific social and ecological conditions or opened by the use of a novel technology. Changes at the landscape level, for example a changing development model, may provoke changes in the lower levels. However, change can also emerge from bottom up, when successful niche-solutions challenge the dominant regime structure.

While the concept of societal relations with nature allows us to characterize the dominant constructions of nature on the macro-level of the water supply-landscape, the multi-level perspective of socio-technical transitions draws the attention to the range of practices that form these relations and their interrelation. However, in order to discover the underlying rationale of the regime and niche configurations, it is necessary to explain what forms the core of these regulations: everyday practices that aggregate in social institutions and cultural symbolizations. Understanding the socio-technical regime (e.g. the modern centralized water company) and the niche configuration (e.g. small artisanal water committee)

<sup>3</sup> The definition of “regulation” used in this paper differs from the notion of regulation in the sense of governmental supervision of the water sector and should not be confounded.

as social practice opens the opportunity to analyze them in depth with the help of theory of practice. In this study, this analysis is realized using the terms and concepts of PIERRE BOURDIEU's theory of practice (BOURDIEU 1979), as the reception of BOURDIEU's work within development geography and water resource management studies shows some valuable ties (SAKDAPOLRAK 2007; DÖRFLER et al. 2003; WESTERMANN 2007). Concerning the context of our research, three concepts of BOURDIEU's theory are crucial and should be described in the following: the social field, the Habitus and the forms of capital.

A social field is described by BOURDIEU as the arena in which different actors take positions in the competition for resources and power (BOURDIEU and WACQUANT 2006, p. 27; SAKDAPOLRAK 2007, p. 55). A field is constituted of "spaces of societal practices" (DÖRFLER et al. 2003, p. 6), from which the strategies of social actors emerge and which by this, shapes patterns of social practices, in our case forms of regulation of water supply. The rules, norms and institutions that govern the negotiation of practices in the social field are, especially in contexts of a "weak" state, often inconsistent and overlapping, and may include formal (written) and informal rules. Considering our case of La Paz, we will see that the "spaces of societal practices" are also related to segregated physical spaces. The way the different players act within the social field depends substantially on their Habitus. The Habitus forms the basis of the perception and assessment of options of practices by the agents. The Habitus is generated by constitutive structures during the socialization in the social field (BOURDIEU 1979, p. 64). Thereby, individual and collective experiences in a similar environment (e.g. a socio-technical regime or niche) produce a similar set of dispositions for actions (BOURDIEU 1979, p. 72), in such an amount that the Habitus embodies the social structures present in the field (BOURDIEU and WACQUANT 2006, p. 61). This confers the Habitus an important role for the agreement of common patterns of behaviour, which thereby also forms part of the identity of an actor or a group of actors. Social change and transformation may provoke changes in the Habitus likewise, however due to its historicity it often results in a conservative element (BOURDIEU and WACQUANT 2006, p. 164).

BOURDIEU used to compare the social field with a game, with coins that reflect different forms of capital the players invest during the game (DÖRFLER et al. 2003, p. 6). BOURDIEU conceptualized different forms of capital: economic, social, cultural and symbolic capital (BOURDIEU 1983; 1997). Economic capital comprises financial assets or goods that can be converted directly into those; this means assets that are institutionalized via property rights. Social capital describes the advantages that arise from more or less institutionalized relations of an actor to a network and groups; the magnitude of the social thereby depends on the size of his network but also on its quality. Cultural capital can have three different forms: material (possessing the prestigious objects), immaterial (e.g. education, upbringing, knowledge) and institutional (reinforcing the value of material and immaterial capital; BOURDIEU 2005, p. 53). Symbolic capital represents additional

authority given to one of the other capitals by means of a recognized position of superior knowledge, power, or wisdom.

In order to make use of BOURDIEU's concept in the context of social-ecological problems, it is necessary to include biophysical elements in the conceptualization of capitals. While natural resources are often considered as economic capital, governed by rights of property or usufruct, in the case of water this idea is on one hand heavily promoted<sup>4</sup> but on the other also contested (cf. BUSTAMANTE 2010). The way how water is constituted as a natural capital depends on the norms and rules. In Bolivia, the state as formal owner of all water resources has the potential control of all water resources, although its power and willingness to compel full respect for its property rights is, until now, only partially exercised.

Part of the "playing" in the social field is to constantly convert one, abundant or available form of capital against another, scarce or desirable. Exchange of capitals functions under specific modes of conversion, which depend on the forms of capital and on the situational context as they are constantly negotiated between the actors (BOURDIEU 2005, p. 65-75).

The way the different theoretic strands are combined is illustrated in Figure 5. It visualizes that the practices that are aggregated in the socio-technical regime or niche configurations are born from a social field, where they were negotiated between different actors. The actors take positions within the field according to their endowment with capitals and objective power relations that influence the field from the wider societal context. The ecological setting derives from the conditions of the hydrosphere at the local and regional scale that is of course influenced by the conditions and changes at higher scales. The input of these physical elements is conceptualized in the framework as form of natural capital, while the way how water (or nature in general) is perceived by the actors and processed in the conception of their actions varies according to their Habitus and endowment with other capitals. For example, the group of actors that promote the central supply company, engineers of the company, workers of the municipality and water ministry, count with the financial capital, the knowledge (cultural capital), the prestige as engineers (symbolic capital) and the power and willingness to use the water resources (natural capital) from other water basins. This concept of action is translated into practice constructing specific artefacts (reservoirs, treatment plants) and establishing corresponding institutions to operate them.

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4 For example in the 4<sup>th</sup> of the Dublin Principles of the International Conference on Water and the Environment (1992): "Water has an economic value in all its competing uses and should be recognized as an economic good".

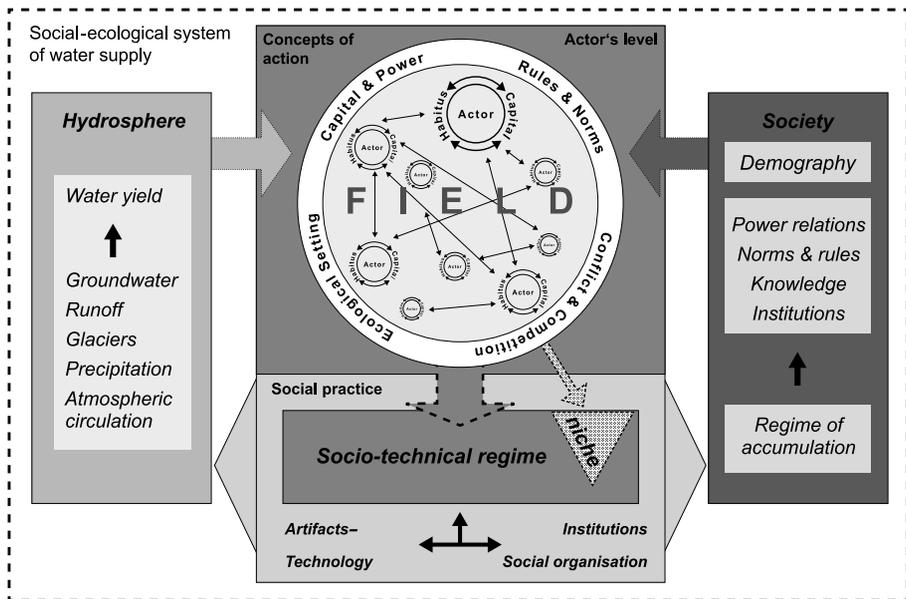


Figure 5: Research framework

Source: Own draft, based on EICHHOLZ 2010, p. 22; SAKDAPOLRAK 2007, p. 55

## 5 Two forms of regulation of water supply

We have identified two different forms of regulation in the city of La Paz, a dominant one and a small, marginal and barely perceived niche solution. In the following, the characteristics of these two forms are analyzed based on the conceptual framework described above. Both forms of regulation correspond to different urban realities, which is why there is either no direct competition between them. However, their relation is not stable and transitions on the landscape level as well as from bottom up may alter this situation.

### 5.1 The dominant socio-technical regime

The central water supply company, at the moment named EPSAS, constitutes the dominant form of regulation, not only because it provides about 95 % of domestic connections, but also because of its discursive hegemony as modern water supplier. The actors that promote this regime are the representatives of the central supplier, parts of the municipal administration as well as staff of the water ministry and international development cooperations, who regard a central company as the technically best, socially most just and finally most modern form of urban water supply.

A centralized supply-network implicates the industrialization of water production according to fordist logics, which aims at providing a standardized mass product of constant quality (BAKKER 2003, p. 332). The artifacts and technologies used in the production of the water resource in this form of regulation are marked by large technical systems (LTS), such as reservoirs and treatment plants. Their operation is oriented on the principles of economic rationality, which demand high technology and specialized, well educated workers, whose number should be in a very smallest proportion to the produced amount of water.

However, the form of regulation has not only a technical side. The fordist logic assumes a steady increase in users as well as a growing demand (SCHRAMM 2006, p. 42), as a consequence of an inevitable process of modernization of the society. Furthermore, it requires certain social institutions, which need to be coherent to secure a proper functioning (FINGER et al. 2005, p. 229). This form involves a certain image of the water consumer and produces a certain relationship with the state (cf. KOOY and BAKKER 2006, p. 269). BAKKER (2003, p. 334) describes the state provided water supply as “material emblem of citizenship”, which serves to “territorialize” the power of state. Accordingly, COUTARD et al. (2005, p. 10) regard infrastructure networks as “socially normalizing devices”, whose development co-evolve with that of the society. The users of central network-based supply systems convert themselves into consumers of a standardized industrial product, into individual clients of a service company and by this transfer the responsibility for provision of fundamental necessity to a, in most cases, abstract third<sup>5</sup>. This delegates the users’ right of decision-making to communal or state representatives that supervise the central company and, in most cases, reduces their participation in the process to the payment of the water bill once a month. This, as part of the process of modernization, strengthens the position of economic capital, this being the form of capital that should be available to the user to get access to drinking water. In order to secure universal access and, thereby, not to delegitimise the socio-technical regime, the state actors often fix the water prices via regulatory institutions.

Apart from the economic issues, the degree of user-participation resulted in one of the most conflictive aspects concerning the implementation of modern socio-technical supply regimes in Bolivia, as the negotiations about the reform of the public water company in La Paz show. While the neighbourhood council of El Alto insists on a strong representation and social control of the company’s management, their opponents claim for a business and technical-oriented administration of the company controlled by the respective organs of representative democracy. As ALBRO (2006, p. 391) notes, there is a widespread distrust among Bolivians in modern, representative forms of organization, which in the republican past too often were (ab-)used by corrupt officials favouring only

5 There are some exceptions, for example the user-owned water cooperative in Santa Cruz, which though being a modern central supply company maintains mechanism of user participation.

the ruling elites. Frequently lamented by the advocates of a Western-style modernization, this distrust, however, is also an expression of the popular and traditional idea of more direct decision making (CARAZAS et al. 2009, p. 51; STRÖBELE-GREGOR 1996, p. 78). For the European context, BARRAQUÉ (2010, p. 30) regards the trust of the consumers in effective and transparent municipal authorities and service companies as one of the pillars of their success. Hence, the lack of confidence towards public servants in Bolivia may explain some of the problems of the Bolivian municipal service companies. In the terms of the research framework, the modern institutions of the dominant socio-technical regime do not coincide perfectly with the ways of social organization of the indigenous customers of El Alto.

Another supporting element for the stabilization of a socio-technical regime constitutes the “internalized beliefs and attitudes” (BOURDIEU 1997, p. 59) that influence also the actor’s concepts of water supply practices. In her analysis of Bolivian water sector, LAURIE (2005) identifies three definitions of modernization associated with water: the ‘technocratic neoliberalism’-idea focuses on institutional change, down-sizing and financial efficiency; the social development agenda stresses community involvement in the maintenance of the supply systems and special strategies for the poor. The techno-fix development idea, according to LAURIE (2005) the most popular among traditional Bolivian engineers, favours technology-oriented big national projects to elevate the society towards a higher development. This idea is prominent in the Water ministry, especially among the mid-level staff (Interviews in the Water Ministry October 2009). The description of these conceptions of modernity confirms the impression gained in the interviews that there is a kind of a techno-fix Habitus among state, municipal and, to lesser extent, cooperation agency’s actors. Many actors that promote the central system of water supply were socialized and educated in the civil engineering colleges in a time when techno-fix solutions were seen as the key to welfare and development and synonym of societal progress. ALLAN (2003, p. 10) describes these kinds of solution as part of a hydraulic mission, whose bases are modern convictions in science, technology and control of nature. Although questioned by concepts related to the reflexive modernity (section 5.3; ALLAN 2005) advanced by some practitioners and cooperation agencies<sup>6</sup>, in Bolivia this paradigm is still highly valued within the local expert community. Furthermore, the word of an engineer is highly respected and often associated to progress and modernity among wide parts of the Bolivian society. Several informal interviews and participatory observations revealed that for many Bolivians, proposals of “*profesionales*” and “*ingenieros*” gain credibility and competence more because of the title of the persons than of the content. By this, in the debate about technical solutions for supply problems, the title can be converted into symbolic capital which can be effectively invested in the social field.

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6 For example the AguaTuya project in Cochabamba supported by the Swedish ASDI.

In conclusion, for the dominant socio-technical regime economic capital plays a major role in two facets: on the supply side, as the technologies (e.g. reservoirs) are capital-intensive, but, as shown above, also on the side of the consumer. In this aspect, the socio-technical regime corresponds also with the logic of the dominant (socio-economic) regime of accumulation, which despite some socialist reforms is still a market economy. Besides this, the regime is based on social capital, which includes the networks of local experts and the staff in Ministries and Municipalities who are convinced of the form of regulation. Moreover, another stock of social capital of this supply practice constitutes the mostly silent approval of the majority of the population of La Paz, which adopted an urban and modern lifestyle and also conforms to a modern, centralized way of water supply. At the end, also the symbolic capital, which consists in the widely shared belief in western-style engineering solutions, should not be underestimated.

## **5.2 The socio-technical niche**

Having the argument of co-evolution of infrastructure and institutions (COUTARD et al. 2005) in mind, it becomes obvious that the form of regulation of the small artisanal communitarian water supply systems differs in many ways from the dominant form. Being small, decentralized systems, operated by the community and based on indigenous organizational values, it appears in many aspects pre-modern and not compatible with the hydraulic mission of modernization. Especially in La Paz it fills a socio-technical niche in the sense of GEELS (2002) that is characterized by the special social and ecological conditions of the slopes described above. Despite the changes in social and living conditions happened since the creation of the communitarian systems in the 1960's, their persistence proves that the social niches may have been changed but not closed. As a World-Bank study of 2007 (PAS and VSB 2007) and the author's fieldwork reveal, the decisive argument for many users of the system is still an economic one. By not buying a complete water service from the central provider, the users of the communitarian systems save scarce financial capital. Instead of money they invest social and human capital, their workforce and a community relation, which by means of the cooperative or committee is converted into a domestic access to water. However, given the (even for low-income households) fairly low monthly contributions, observers from outside relate this argument rather to a culture of parsimony inherent to the Aymaras<sup>7</sup>.

Another factor that may explain the persistence of the communitarian model is, ironically, related to their weak positions in the social field. The disregard they experienced by the official authorities outside the community led to a backlash among the people of slopes

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<sup>7</sup> In this context, the interviewed persons from the Water Ministry, Municipality and Central Water Company provocatively asked why "the Aymara people spend huge sums on alcohol and parties whereas nearly nothing for drinking water" (Author's interview in September to October 2009).

towards their own cultural values (SANDOVAL et al. 1987, p. 48; RIVERA C. 1993, p. 86)<sup>8</sup>. In several occasions, the communities actively defended their rights against intends to end its existence, as it happened during the privatization of the water supply in La Paz and Cochabamba. This experience, still present among the users of the communitarian systems, helped to increase the identification with their committees and cooperatives, who perceive their water supply as something of their own that is worth to be defended<sup>9</sup>. In this context, people are telling that the central supplier “wanted to invade our systems” (Group discussion with cooperative users and directors, 11 Oct 2009). The words they use to refer to this situation demonstrate that space is a category that links their societal practices with the physical environment they inhabit. This also shows that the fragmentation between those down (in wealthier quarters in the valley) and those up (in the slopes) is a distinction still present in the minds.

Another attribute that characterizes the niche configuration in the slopes of La Paz is that they act outside the official regulatory regime. Yet, few systems are registered in the state sector authority. Water quality and operational norms and standards are not observed by most of the systems. This being an effect of chronic financial crisis of the systems, it is certainly related to the low awareness by part of the users. However, although many cooperatives do not make a proper disinfection which results in high concentrations of coliforms at the tap, many users instead of claiming a better (possibly more expensive) central treatment prefer to disinfect the water by boiling it.

Nevertheless, the core of the communitarian model is the participation of the users<sup>10</sup>, in the decision taking on tariffs and extension of the coverage, but also in the operation and maintenance of the systems. The statutes of water committees and cooperatives name solidarity, reciprocity, equity, justice and transparency as their basic principles, with the general assembly of all members being the maximum authority. Concerning these principles, the communitarian systems often make reference to ancestral ‘uses and customs’ (*usos y costumbres*) which distinguish their practices from those of the central system. This reference is backed by a public and academic discourse that under the flag of the good life (*buen vivir*) questions the liberal-modern forms of imagining life in favour of communitarian forms of organization (ZIBECHI 2008; PATZI P. 2011).

The niche solutions were made up with the capital and the Habitus available. As economic capital, including technical and financial capital, was and is scarce in the slopes of La Paz, it was substituted as far as possible by social capital. The communities used their

8 An important figure in the re-valorisation of the popular culture in the 1980’s was the TV and radio-moderator Carlos Palenque, among several other communal radio stations.

9 In interviews water committee leaders told of trials against the municipality and the central water supplier and their active participation in the protest against the privatization.

10 With the words of a committee’s director: “The communal work and assemblies are the soul of our cooperative.” (Interview 8 Oct 2009)

joint work force and knowledge to build their systems, complemented in some cases by the use of some (clientelistic) relations to municipal or state officials in order to get materials or monetary support. The easy access to the natural capital (water) may be characterized as an enabling factor, as the search for water sources without the several nearby natural fountains would be much more complicated. The cultural or symbolic capital which is related to this form of regulation increased with the time, as more and more people perceive the communitarian systems as part of their identity.

### **5.3 The landscape level: state policies and academic discourse**

Concerning the conceptual framework, the state and the agencies that represent it form a powerful actor within the social field from which the practices that regulate the water supply emerge. In their rule-setting and normative function the state policies have great influence on the landscape of possible socio-technical configurations of water supply, be it by means of incentives and financial support, or through technical standards and norms or laws that prescribe certain organizational features of the water supplying entities. In that sense, for example, the new constitution excludes private water companies from the field of water supply, as a private participation in water supply is now prohibited (MMA-YA 2008, p. 6).

However, in other areas the reach of the state power and policies vary a lot, historically as well as geographically. The hill slopes of the La Paz valley or the southern, peri-urban districts of Cochabamba were for a long time forgotten areas, and the attention, but also the influence of the state is only slowly increasing since several years. This left niches for alternative socio-technical forms of regulation. First born from mere necessities, these forms were understood more and more as part of the process of reconstruction of ancestral Andean ways of communal organization (CARAZAS et al. 2009; authors' fieldnotes). An open question remains how the current, apparently more state centric water policy affects the niche of the communitarian water systems. The situation is ambiguous: on the one hand the government incremented dramatically the inversion for the drinking water sector, between 2006 and 2009 about 120 Million Euro (ORELLANA H. 2010, p. 57), and pushed forward several projects to reach areas without a proper water supply, especially in peri-urban areas of El Alto, Cochabamba and Santa Cruz. In these programmes, also communitarian water systems were recognized by the Ministry and financially supported (MMAYA 2008, p. 6). Furthermore, efforts were made to combine both models of management via institutional arrangements (below; HOFFMANN 2005).

However, on the other hand, critics of the government assert that the support since 2010 diminished in favour of big light tower-projects, which are more related to the modern techno-fix logic of supply and certainly fulfil a function to territorialize state power (CRE-SPO F. 2010). From this perspective, the state actors under the flag of modernization and

progress are using their power to close the niches for self-governed, alternative forms of regulation. This goes in line with the overall view on the relation between modernity and possible alternatives expressed by Vice-President García Linera: “Basically, all want to be modern.” (GARCÍA LINERA 2007, p. 52). According to this assumption and the socialist background of the MAS-Administration, the orientation towards a state-driven and “socially normalizing” (COUTARD et al. 2005, p. 10) modernization of the water sector becomes understandable, even though some alternative aspects are included (GARCÍA LINERA 2010).

In this discussion, the National Water Movement that led the anti-privatization protests in 2000 and 2005 has split up in at least two fractions: people and groups that embrace the major role of the state and integrate themselves in new state structures and institutions, including the Water Ministry, and activists that criticize the subordination of water organizations under the government that led to a reproduction of the old clientelistic structures of distribution and limits the autonomy of communal water organizations (BUSTAMANTE 2010; CRESPO F. 2010 and Interview with C. CRESPO, August 4, 2011).

Apart from the social and political discourse on the model of water supply, there is also a technical-academic discourse on which form of regulation meets best the challenges of a sustainable water supply. According to ALLAN (2005) the leading paradigm of water management in the modern age built on an industrial production of water resources via large technical systems (LTS), which permitted to achieve a wide coverage of supply in the big industrialized agglomerations of European and North American countries. However, this paradigm is linked to the fordist societal relations with nature described by BRAND and GÖRG (2003) and marked by a tendency towards a gradually perfected domination of nature by humans through sophisticated technology. KLUGE and SCHEELE (2008) describe these solutions as build-and-supply approaches that provide a universal service not distinguishing different uses. Besides this, through interbasin water transfer it establishes a relation of centre – periphery with the urban hinterland, which not seldomly leads to conflicts with the rural communities hosting the water resources<sup>11</sup>. However, along with reflexive modernity (ALLAN 2003, p. 10), water management is increasingly thought from the demand-side. This provokes a paradigm-shift from big central facilities towards decentral or semi-central technologies and structures, while according to KLUGE and SCHEELE (2006) the mayor challenges are not the technological ones. In this regard, the example of Cochabamba represents a step towards decentralized and locally adapted management patterns. Here, institutional arrangements between the central municipal water company and community-managed water systems in the southern city districts organize the sale “en bloque” of water treated by the company to the communitarian systems that are in charge of the distribution and accountance to the end user (HOFFMANN 2005, SENASBA 2011).

<sup>11</sup> The water scarce city of Cochabamba is an actual example for such a conflict (La Razón, September 1, 2011), but also La Paz experienced tensions with neighbouring towns (Interview with the sub-mayor of Palca, October 10, 2009).

In resume, while on the practical level the interference of the dominant socio-technical regime and the niche configuration is low, there is a controversial debate on the landscape level of the interrelation between both two forms of regulation.

## 6 Conclusion

The paper presents a facet of inequality common in cities of the Global South: differential access to water services as the extension of networks could not keep pace with the rapid processes of urbanization. Instead of the universal supply networks known from western countries, the urban water supply pattern splits up in fragmented spaces, leaving one part of the population with state-subsidized modern service facilities (“premium networked spaces”, GRAHAM and MARVIN 2008, p. 39) and another up to self-organized solutions. These different forms of regulation of water supply reflect not only the fragmentation of urban Bolivian societies, but also the richness of ways of social organization that emanate from the social field of water supply practices. The practices are composed by specific technologies and artifacts that correspond with forms of social organization and form stable, dominant socio-technical regimes as well as small niche configurations. In Bolivia, modern and ancestral social institutions co-exist and it is the process of urbanization that brings both logics together. The fragmented peri-urban quarters that were filled with migrants from rural and mining areas constitute a niche for alternative water supply solutions. Being for a long time neglected by authorities and out of public attention, changes on the landscape level now increase the attention for these areas. On the one hand, the socialist MAS-government redefined the position of the state as a player in field of water supply and seeks, under the flag of universal access to basic services, to extent water services as a “material emblem of citizenship” (BAKKER 2003, p. 334) to areas whose integration in the modern society has always been only partial. In this regard, the extension of universal, often central and modern services constitutes a political project that tries to eliminate the social inequality in the context of the Bolivian discourse of social, political and cultural change (*cambio*). On the other hand, the communitarian supply systems in the peri-urban quarters are revalorized as autonomous spaces of self-governance, inspired by traditional Andean forms of organization. Not longer seen as precarious and dequalified as remnant of pre-modernity, the local character of communal organization may fit with the claim for decentralized service networks from post-modern Western water management. An open question remains whether communitarian forms of water supply are exclusively linked to areas that are not (yet) reached by the modern state and lifestyle.

The study proposes to analyze the water supply as practices negotiated on a social field. Be it a big water company or a small neighbourhood committee, the supply solutions are developed on the basis of specific rationalities and the availability of capitals. As the case of the slopes of La Paz shows, the resulting practices are often connected to differential physical and social spaces, whose transformations constitute a topic for integrated geographic research. Moreover, the empirical analysis of spaces of post- and alternative

modernization may advance the debate on a post-modern development geography. This perspective, apart from relativizing the still often assumed superiority of Western solutions for human problems, can serve as mirror to critically check the rationale of modern supply paradigms in regard to sustainability and justice criteria.

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## **Inequality and Water in the Amazon Basin: the Difficulties of Cooperation and Sustainable Management**

Fernanda Mello Sant'Anna (São Paulo/Utrecht)

### **Abstract**

This article aims to analyze the governance process and the management of transboundary water resources in the triple border zone of Bolivia, Brazil and Peru in the Amazon Basin. This tri-national border includes the Departments of Pando in Bolivia, Madre de Dios in Peru and the State of Acre in Brazil, and is known as the MAP Region. They share some sub-basins of the Amazon Basin, such as the Acre River Basin, and face cooperation and governance problems in managing transboundary issues. Although the border towns need to find solutions to their water related problems they do not have the technical and financial capacity to overcome them and are not involved in the Amazon Cooperation Treaty Organization (ACTO). In spite of the cross-border networks in these border towns they depend on national institutions to fully solve their problems. Thus the governance process to manage transboundary water resources faces many challenges, including the lack of coordination and cooperation among governance processes and institutions on different scales (local, national and international). National institutions and the ACTO do not participate in the cross-border networks aiming at the solution of water related problems in the border area, with the exception of some Brazilian national institutions. This also represents another problem related to the asymmetries of power between Bolivia, Brazil and Peru that has to be considered in cooperation processes aiming to manage any transboundary sub-basin of the Amazon Basin.

### **1 Introduction**

This article investigates the management of the transboundary Acre River Basin from a multi-scalar perspective and analyzes how different actors, institutions and governance mechanisms on different scales articulate and coordinate their actions to manage the transboundary water resources in the Acre River Basin. The analysis examines whether this articulation and coordination forms a single process of transboundary water resources management in the Acre River Basin, which involves the analysis of institutions and actors of the three countries that share the basin: Bolivia, Brazil and Peru.

The main questions that are discussed here are: what are the main transboundary problems related to the water resources in the Acre River Basin and what are the main ma-

agement challenges? How do the institutions involved in the management of the transboundary Acre River Basin on the local, national and international scales articulate and coordinate their actions?

The article discusses recent approaches to integrated management of transboundary river basin water resources and international and cross-border cooperation. Furthermore, the research used semi-structured interviews with people related to the MAP Initiative, the management of the Acre River Basin, the Amazon Cooperation Treaty Organization (ACTO), national government institutions and people in the Brazilian Ministry of Foreign Affairs involved with the ACTO and the project to manage the Amazon Basin. Documents from national, state and municipal government institutions, the MAP Initiative and the ACTO documents were also analyzed.

## **2 Integrated management of transboundary water resources and multi-scalar governance**

Water is a natural renewable resource essential to life, and its appropriation and control reveals its political nature since it concerns all human groups (RAFFESTIN 1993, p. 231). Its appropriation depends on access to the territory where it is situated. Therefore water, as any other natural resource, could be the motive for power and conflicts among states and other social actors. The multiplicity of uses that water resources provide to society and their increasing degradation due to reckless use have enlarged the list of water conflicts (RIBEIRO 2008). To solve these conflicts among users and social groups who depend on this shared resource it is necessary that the parties involved engage in water resources management.

There are thus certain specific concepts that are used to point out the politics involved in the use of water and its related conflicts, for instance terms such as hydro-politics, hydro-political resilience and hydro-political vulnerability. Hydro-politics “relates to the ability of geopolitical institutions to manage shared water resources in a politically sustainable manner, that is, without tensions or conflict between political entities” (PRISCOLI and WOLF 2009, p. 22). And hydro-political vulnerability “is defined by the risk of political dispute over shared water systems” (PRISCOLI and WOLF 2009, p. 23).

In this attempt to manage water and prevent conflicts, scientists and experts have dedicated their efforts to improving water management. Increasingly, institutions and experts have recommended using the river basin as the basic territorial unit to manage water. River basin management has been recommended because of the many arguments that state that from an ecosystem perspective the river basin is the natural territorial unit for the management of water resources. It is argued that “effective protection of water resources,

in terms of both quality and quantity, depends on a management concept which reflects the complexity of water-based ecosystems” (MOSS 2003, p. 89).

Nevertheless, this river basin management approach has many implications for existing institutional organization in many countries, because this kind of management is based on the natural limits of the river basin and not the political administrative limits of municipalities, states and countries. River basin management has major implications when a river basin is shared between two or more countries, thus requiring an international institution to manage the basin. In general, there are not many institutions of this kind in the world, and the existing ones have innumerable difficulties in managing internationally shared river basins since the only international convention<sup>1</sup> relevant to the issue has not gained enough ratifications to come into force (WOLF et al. 2003; CONCA 2006).

The main issue here is how to manage a natural resource, such as water, when its physical characteristics do not match the spatial boundaries within which the institutions that are in charge of it operate (MOSS 2003; YOUNG 1999; OSTROM 1990). In other words, managing a river basin is “a classic case of trying to solve problems of spatial ‘fit’ arising from managing a biophysical system along political-administrative territories” (MOSS 2003, p. 1). The problem of mismatch between ecosystem and institutional boundaries is related to the issue of identifying the causes of a problem, such as water contamination, beyond the point of origin through a wider approach to causal effects, using a systemic perspective. What spatial unit would be better for the governance of public goods? As explained by MOSS, “the lack of fit causes spatial externalities, benefiting free-riders and harming others beyond the spatial reach of the responsible institution” (2003, pp. 2-3).

To overcome the problems caused by the externalities resulting from the spatial mismatch between natural ecosystems and the political boundaries of institutions, it is necessary to reorganize institutions or political boundaries, or, in the case of water, to cooperate and coordinate actions with other institutions within the same spatial unit. This is especially difficult since water is a resource related to different sectors and, in the case of some river basins, affects different scales.

River basin management is part of good water governance goals. In this sense, water governance is understood as the decision making process and institutions that make decisions about how to manage and use water. The good governance principles are: openness and transparency in the decision making process, participation of the people involved and affected by the water management (democracy), application of the law, and ethics and integrity as cautionary actions against corruption (LAUTZE et al. 2011).

<sup>1</sup> The Convention on the Law of the Non-navigational Uses of International Watercourses was adopted by the General Assembly of the United Nations on 21 May 1997.

As water governance in general, and integrated river basin management specifically, transcend political boundaries and various sectoral borders, a multi-scalar and inter-sectoral governance process to comprise all the complexity of social and environmental relations in a river basin is required. Interaction among different institutions on different scales is a factor that influences the institutional effectiveness of water resources management (MOSS 2003). In this sense, there are problems of horizontal interaction among institutions from different sectors, as for example the relation between a River Basin Committee and the Planning Secretary of a Municipality responsible for zoning and land use. And on the other hand, there are problems of vertical interaction among institutions on different scales, such as the relation between water management institutions on the local/municipal scale that are very aware of the specificities of water management in a locality but have a limited view of the whole basin, and the regional and national water management institutions with a more general view of the issue.

The interactions among institutions on different scales also raises questions about legitimacy and equity since scales are social constructions and reflect power relations in society (MOSS and NEWIG, 2010, p. 1). Thus, changes in scale to solve a social environmental issue reflect a new configuration of power.

Bearing that in mind, this paper analyses the governance process managing the water resources of a transboundary river basin in the MAP region. Under consideration are a local scale initiative and its relation and interaction with other initiatives on the national and international scales that manage water resources in the Amazon Basin.

### **3 Social and economic characteristics of the MAP region**

The MAP region is located in the triple border of Bolivia, Brazil and Peru, in the occidental part of the Amazon, and it consists of the Department of Madre de Dios (Peru), the State of Acre (Brazil) and the Department of Pando (Bolivia). These three states together have an area of 300,000 km<sup>2</sup> and 822,000 inhabitants; they are also characterized by great biological diversity and some tributaries of the Amazon River. However, paving of the Interoceanic Highway, the spread of cattle ranching, logging and mineral exploitation has caused deforestation of up to 10% of the total area of the region (MENDOZA et al. 2005).

Before colonization, this region was populated by many indigenous tribes. After the signing of the Tordesilhas Treaty (in 1494) and the arrival of the Europeans in the Americas, the region went through different processes of territorialization due to the arrival of scientists, travelers, diplomats, the military and rubber tappers. In the eighteenth century the influx of new settlers intensified because rubber became an important product, particularly to the car industry. Most of the people that came to the region were from the Brazilian northeast, Santa Cruz da Bolivia and the Peruvian Andes, and they all became rubber

tappers, in general, working for a rubber farm owned by a “*seringalista*” (the owner of the rubber farm). After the falling of rubber prices, the owners abandoned the region and the rubber tappers formed agricultural colonies or moved to cities like Rio Branco in Brazil and Puerto Maldonado in Peru.

Furthermore, it is worth mentioning that there was a territorial conflict that resulted in armed conflict, but not a declared war, between Brazilians and Bolivians about Acre territory. The signing of the Petrópolis Treaty in 1903 settled the dispute, giving the Acre territory to Brazil in exchange for other lands, money and the promise to build a railway.

### **3.1 State of Acre, Brazil**

The State of Acre is the biggest in the region with an area of 152,581 km<sup>2</sup>, 22 municipalities, and a population estimated (in 2007) at 655,385 inhabitants and a population density of 0.3 inhabitants per km<sup>2</sup> (IBGE 2008). Approximately 70% of the population lives in the urban area, the capital Rio Branco concentrates 290,639 inhabitants, almost half of the state’s population. About 49.5% of the state territory is designated as protected areas of some kind, such as national and state parks and indigenous territories (IBGE 2008).

After the Brazilian military coup in 1964, the government initiated an occupation policy towards the Amazon, justified by the territorial integration and national security discourse. In Acre State the federal government gave incentives to attract national and foreign investments to the region, attracting many people from outside the Amazon to buy lands in Acre. This situation generated land speculation, land concentration and expulsion of the rural population to the cities, especially to Rio Branco. Part of these recently bought lands were converted to pasture and the other part continued to be privately owned rubber farms (BEZERRA 2006; DUARTE 1987).

However, some conflicts started between the foreign farmers and the rubber tappers which led to the organization of the rubber tappers. In 1986 they started the Meeting of the Amazonian Rubber Tappers and created the National Council of the Rubber Tappers. The prime objective of this movement was to have the right to the communal land. One of its leaders was Chico Mendes, who was killed in 1988. Finally the government accepted the demands of the rubber tappers and created the Extractive Reserves (DUARTE 1987; ALLEGRETTI 1994).

Regarding the indigenous people in Acre, there was no initiative by the government to demarcate their territories until 1975, when the governmental institution FUNAI (Indigenous National Foundation) started a demographic survey. Nowadays there are 14 indigenous peoples in Acre and 24 regulated Indigenous Territories, with another 11 in the process of being regulated (FUNAI 2007).

### **3.2 Department of Madre de Dios, Peru**

Madre de Dios and Pando are the least populated departments in Peru and Bolivia, respectively. The Peruvian Amazonia Department of Madre de Dios has an area of 85,182 km<sup>2</sup> and a population of 114,000 inhabitants with a population density of 0.7 inhabitants per km<sup>2</sup>. About 62% of the population lives in the city Puerto Maldonado, the department capital, and 70% come from the highlands of the Andes region.

More than half of its territory is declared as a national reserve (BRITO 2007; PEREIRA 2007; VAN OOSTEN 2004). However, parts of these areas are characterized by some kind of exploitation. As noted by VAN OOSTEN, the rainforest in this department provides “the economic base of the department, with timber extraction as a major source of income supplemented by other extractive activities like the collection of brazil nuts/castaña, and the exploitation of gold and petrol” (2004, p. 10). In the 1970s petrol and gold were found in the department, stimulating migration. There was also agricultural expansion in this period, with the start of coca and cocaine production (BRITO 2007).

The remoteness of the Madre de Dios Department contributed to the actions taken by the guerrilla movement “Sendero Luminoso” in the department’s area and also to the absence of Peruvian state institutions, resulting in a high degree of lawlessness. During this period a large part of the economy was dedicated to illegal activities. This situation of low government influence and illegal activities obstructed the formation of social organization and regional governance. But since the nineties “a serious start has been made with the creation of a regional democratic governance system, and a process of participative regional development planning” (VAN OOSTEN 2004, p. 10).

### **3.3 Department of Pando, Bolivia**

The Department of Pando is in the extreme north of Bolivia and was created in 1938 by supreme decree. It has an area of 63,827 km<sup>2</sup> and a population of 52,525 inhabitants, and Cobija is the capital. This department is almost all covered by forest, which explains that its main economic activities are related to the forest sector, like the collection of Brazil nuts and rubber, and logging (BRITO 2007; PEREIRA 2007). Agricultural production is incipient but cattle ranching is increasing in the region.

Watercourses make up 1,468 km<sup>2</sup> of Pando’s total surface area and there are 87 km<sup>2</sup> of roads and paths. The latter are responsible for departmental and interdepartmental communication and have been increasing in recent years. The urban area corresponds to 153 km<sup>2</sup> (only 0.24% of the departmental total surface area), leaving a rural area of 62,106 km<sup>2</sup> (97.32% of the total area) to be the object of a land tenure policy. This indicates that Pando is an essentially rural department with the urban mostly concentrated in Cobija and

a few other small settlements that are provincial or municipal capitals (Rojas 2010). In spite of progress in Pando's urbanization, only 40% of the population lives in the capital Cobija and a few other rural towns (VAN OOSTEN 2004).

Although Riberalta, with its more than 60,000 inhabitants, belongs to Beni rather than Pando it is very important to Pando's economy. The town has a larger industrial base and plays a significant historical role for Pando because of its processing and commercializing of rubber and Brazil nuts (VAN OOSTEN 2004).

Pando's economy was always based on the forest. Since the beginning of the rubber cycle it has been a provider of raw materials which were sent to Riberalta to be processed in the processing plants there. The basis of Pando's economy was initially the exploitation of rubber, but nowadays the collection of Brazil nuts forms the pillar of the economy with a recent increase in the volume and importance of timber production.

After Cobija became the department's capital the government sector increased and Cobija gained in importance as a result of administrative decentralization in Bolivia. Public expenditure was therefore responsible for the rapid growth of the city, influenced by rural-urban migration, but also and especially by migrants coming from highland cities in search of better economic conditions (VAN OOSTEN 2004).

Until recently the main political issue in Pando was that of land tenure. The Bolivian agrarian reform of the fifties had little or no impact in the Amazon area. The process of land distribution and ownership started in 1996 in Pando and ten years later received a new impulse from the agrarian reform that was mostly to the benefit of the indigenous peasant communities. An area of 500 ha of rural property per family was established and after a discussion and consultation process it was decided to take into account the necessities of the families in terms of the collection of brazil nuts and other forest products and activities. Pando is the first department to finish the land distribution and ownership process, after the creation of a Conflict Resolution Commission, and 182 indigenous and peasant communities were identified (ROJAS 2010, pp. 35-37).

### **3.4 Major social and economic changes in the MAP region**

Cattle ranching is growing in the MAP region as a whole, and Pando has already about 47,000 animals and 342 ranches. In Acre cattle ranching is the main economic activity and there are more than two million animals (BRITO 2007).

Illegal activities such as illegal logging and drug trafficking have increased in the MAP region. Illegal logging not only has environmental consequences but there are also social impacts when indigenous territories are invaded by loggers. Drug trafficking also causes

environmental and social degradation through the illegal cocaine laboratories that discard production residues in forest rivers and the invasions of and attacks on indigenous communities.

As noted by BRITO (2007) and PEREIRA (2007) the MAP region is characterized by very explicit social exclusion and inequality with high rates of unemployment in the urban areas. Even with the increase in the economic activities, social exclusion is still very high in the region. According to FRANCISCO SOUZA (2006, see also BRITO 2007), between 42% and 51% of Pando's total population are considered poor with a daily income lower than one dollar, and this is even worse in the rural areas. Data from 2001 attest that 72% of Pando's population was constituted by poor people, but with a great disparity between Pando and the other municipalities (BRITO 2007).

Public services in the region, such as sanitation and water, are very deficient, especially in rural areas. The recent urbanization process was not planned and resulted in urban areas lacking the necessary infrastructure to serve all the population (BRITO 2007).

Pando and Madre de Dios went through a political reform involving state decentralization. In Pando the National Dialogue Law that aimed to establish participative planning was not able to fulfill its goals. Coordination between Pando's government and the municipal governments is still insufficient, as is resources distribution to municipalities (BRITO 2007).

As observed by NIJENHUIS (2006), Bolivia has been following an ambitious decentralization policy since 1994, aimed at transferring funds and responsibilities from the central to the local, municipal level of the rural-urban municipalities. The central government distributes 20% of the national tax income each year according to the number of inhabitants of the 314 municipalities. Therefore, municipalities are now responsible for education, health and transport infrastructures. The institutionalization of popular participation in local decision-making is a great feature of the Bolivian decentralization process. Problems are caused however by participatory planning being implemented in a top-down manner, corruption, lack of funds and coordination deficits. This has created an ongoing dynamic of popular participation in a relatively short period of time. However, despite all that "many studies (BOOTH, CLISBY and WIDMARK 1997; AVILES IRAHOLA 2005) conclude that particularly the deprived rural population has gained more access to basic services" (NIJENHUIS 2006, p. 118).

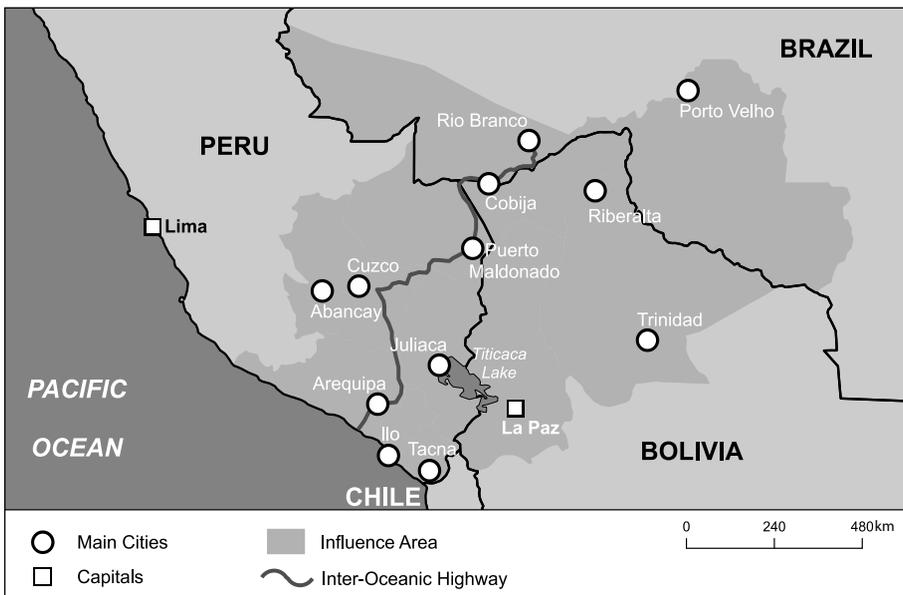
As a result of this decentralization VAN OOSTEN (2004) believes that Pando's influence on the national political system has increased during the nineties. Since then "a new class of regional politicians was able to penetrate the national government structures, bringing

the Amazonia on the political agenda” and “augment[ing] the interest of politicians and potential investors” (VAN OOSTEN 2004, pp. 10-11).

In Peru the regional governments were transformed into departmental governments in 1993, resulting in more autonomy for the Department of Madre de Dios. However, departmental governments are not directly elected and there are no channels for popular participation (BRITO 2007).

### 3.5 The main social and environmental issues in the MAP region

BRITO (2007) points out that the three main social and environmental problems in the MAP region are: the negative impacts of the Pacific Highway, the water resources management and the increasing deforestation. The Pacific Highway connects Brazil to the ports in the Pacific. In Brazil the highway is called BR-317 and it is already paved. On the Peruvian side the paving work has already started and is financed by the Brazilian Banco Nacional de Desenvolvimento Econômico e Social (BNDES), the Corporación Andina de Fomento (CAF) and the Peruvian government (BRITO 2007; IIRSA 2007). The Pacific Highway is part of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA), launched in 2000 by the twelve South American governments.



*Figure 1: Peru-Brazil-Bolivia Axis, IIRSA*

*Source: IIRSA 2008; Cartographic Elaboration: Tito Livio Barcellos Pereira*

The social and environmental concern related to the Pacific Highway is due to its consequences in terms of increasing deforestation and forest burning<sup>2</sup>. DOUROJEANNI (2001) highlights the major impacts of the highway as: deforestation, increasing of the risk of forest burning, illegal hunting, soil erosion, invasion of protected lands, biodiversity loss, increasing of illegal activities such as drug trafficking and production, and slums formation, among others. According to this author (DOUROJEANNI 2001), Peru is less institutionally prepared than Brazil to handle these impacts.

There is asymmetry among the environmental institutions in Bolivia, Brazil and Peru. Brazil is more institutionalized, there is an Environmental Ministry and the National Environmental Policy Law dates from 1987, with environmental law being very developed. In Peru the Environmental Ministry was established in 2009 and in Bolivia environmental policy is in its infancy with environmental issues being treated together with agricultural issues (FERRO 2007).

Nevertheless, the Acre State is the most deforested in the MAP region, the southeast part of Acre, an area of the Acre River Basin, is part of the “Arco do Fogo” (fire arch) where the highest deforestation rate is concentrated, and 80% of all the deforested area in Acre State is found (BRITO 2007, p. 165).

The MAP region can be seen as a region where planning in the respective national territories faces a dilemma between development and conservation. Its position as a South American geopolitical border and world geo-economic frontier has sometimes cooperated and sometimes competed with the Amazonian traditional way of life. This region has gone through remarkable geographical and historical transformations that are relevant to the understanding of contemporary social-spatial challenges. The region is a current scenario of global corridors, both for development and conservation purposes. And this shows that there are different conflicting interests guiding different planning strategies to develop and to preserve this part of Amazonia.

How can the region be developed without causing major impacts that could jeopardize the sustainability of natural resources? The answer to this question lies in the great challenge of guaranteeing the sustainability of water resources in the Acre River Basin. And this challenge is even more urgent now since the MAP region has been affected by infrastructure projects by IIRSA, agriculture colonization projects and widespread cattle ranching.

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2 In 2005 a major fire, aggravated by three months of drought in the region, caused a great concern among the population. More than 15,000 burning hotspots were detected, mostly in Acre State, and concentrated along the Pacific Highway. Fires were also detected in the border areas of Cobjia and Iberia, near the National Reserve of Tampopata (Madre de Dios). In this year, the lengthened dry season caused problems with the water supply system in Rio Branco. The Acre River Basin that supplies the city has 68% of its area deforested (BROWN 2006; BRITO 2007).

#### 4 Transboundary water resources of the Acre River Basin

The Acre River originates in Peru, at a height of between 300m and 400m near the Brazilian border (DUARTE 2008; MT 2008; REIS et al. 2007), and it is a tributary of the left bank of the Purus River. It flows from southeast to northeast, where it enters the Purus River near the town of Boca do Acre in Brazil. It is the border between Brazil and Peru until the town of Brasiléia, and then it is the border between Brazil and Bolivia until Cobija when it enters Brazilian territory. The Acre River flows along more than 1,190 km from its point of origin to its mouth (DUARTE 2007).

The Acre River Basin is formed by the Xapuri River, the Riozinho do Rola River and other minor tributaries as “*igarapés*” (small rivers), and includes some urban sewage systems that flow into the Acre rivers. Some of the watercourses that flow to the Acre River may even run dry in the dry season (DUARTE 2007).

The rainy season in the Acre River Basin lasts from January to May, and the dry season lasts from June to December. The 311 km of the Acre River stretching from Rio Branco to Boca do Acre is navigable, with a depth of 0.8 m along almost all the route. It is considered as the continuation of the Purus River waterway that allows boats to pass through to Rio Branco. On the other hand, the part that goes from Rio Branco to Brasiléia is

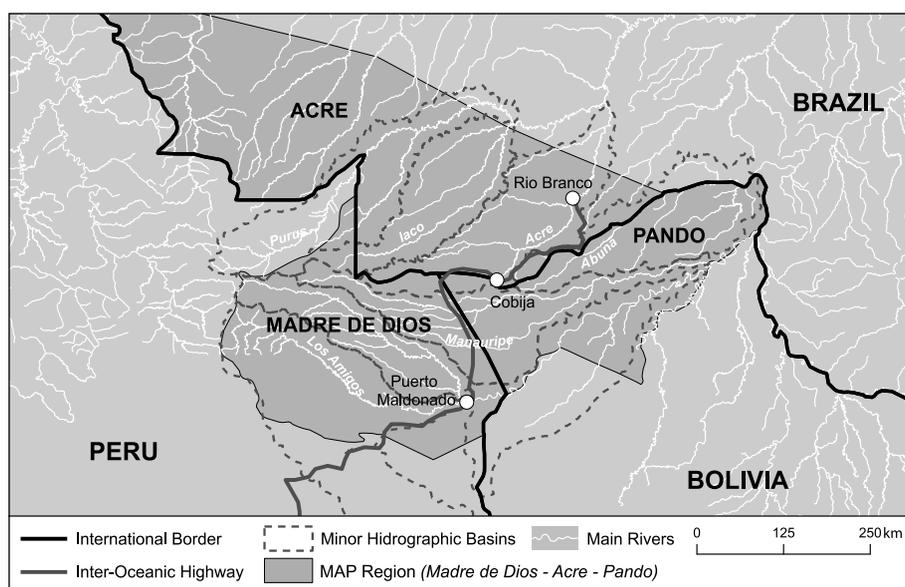


Figure 2: Bi-national and tri-national River Basins in the MAP region  
 Source: MAP 2008, adapted; Cartographic Elaboration: Tito Livio Barcellos Pereira

shallower and only passable during the rainy season. This route has 635 km and is very meandering (DUARTE 2007). Along the Acre River there are some towns such as Assis Brasil, Brasiléia, Epitaciolândia, Xapuri, Porto Acre and Boca do Acre, the two state capitals Cobija and Rio Branco and other small villages (DUARTE 2007).

The fluvial drainage net of the Acre River Basin drains an area formed mostly by young geological units, the Solimões formation and ancient alluvial terraces that follow the main drainage areas and recent sediments of rivers (DUARTE 2007).

The annual precipitation in the Acre River Basin has an average of 1,940 mm, whereas the period with the greatest rainfall concentration is from November to March. Deterioration of forest cover in the watershed areas has contributed to the decrease in rainfall in the region (DUARTE 2007).

The changes in the land cover and land use in the Acre River Basin have caused many negative impacts for the ecosystems, such as changes in the precipitation distribution and quantity during recent decades. This situation was evident in the episodes of the severe drought in 2005 and the major flood of 2006, which caused great concern among the population, especially those who live along the river banks (DUARTE 2007). In the last few years prolonged droughts have occurred in the Acre River Basin that can be related to the increase in the deforestation rates, mainly due to cattle ranching.

The part of the Acre River Basin closer to the borders and the point of origin of the Acre River includes the border towns and is called the Upper Acre River Basin. It has an area of approximately 7,577 km<sup>2</sup>, with 3,181 km<sup>2</sup> in Brazil (41% of the total river basin area), 2,560 km<sup>2</sup> in Peru (33% of the river basin area), and 1,936 km<sup>2</sup> in Bolivia (26% of the river basin area).

The main problems related to the transboundary water resources are basically four: floods in the rainy season and their consequences; droughts in the dry season and the consequent crisis for water supply and fishing, aggravated by the deforestation; water pollution due to the lack of sanitation in the towns and cities; and the fact that the river is the border between the countries, this causes some problems for the border towns because of the constantly changing channels and meanders of the river.

This list of the main problems related to the water management of the river basin was based on interviews with people from public institutions and social organizations in the MAP region related to water management, as well as on documents and discussions of the Acre River Working Group.

## 5 Local governance process and the Acre River Basin management

The proposal for an integrated management program for the tri-national Upper Acre River Basin originated from the demands presented by the regional communities of the three countries of the MAP region, in 2002, at the MAP Forum in Cobija, Bolivia. This forum aimed to strengthen collaborative action and regional integration, and the final document presents as Recommendation 8: “priorizar el plan trinacional de manejo integral de la Cuenca del Río Acre como punto de partida para la protección de las otras cuencas hidrográficas, cursos y cuerpos de agua de la Región MAP” (MiniMAP Bacias 2007).

After this meeting, a consultation letter was sent to the Amazon Cooperation Treaty Organization (ACTO) by the Border Committee Assis Brasil-Iñapari demanding information about the establishment of a tri-national committee for the Upper Acre River Basin. However, in spite of the fact that the ACTO had sent a representative to follow the activities in the Acre River Basin, nothing more significant (such as technical or financial support) was offered by the organization to help the border initiative. The preparation of the integrated management of the tri-national Upper Acre River Basin program began in 2003, when the Brazilian municipalities established the Consortium for the Inter-municipality



Figure 3: Brasília's neighborhood, in Acre State, Brazil

Source: CONDIAC 2010

Development of Alto Acre and Capixaba (CONDIAC). CONDIAC was officially implemented in 2004 together with the structuring of the Regional Integration and International Commission. This was followed by a proposal for the establishment of a tri-national committee where the inter-municipal consortiums could sign agreements to develop activities in the triple border region.

Then, the Border Municipalities of the MAP Region Committee (referred to in this article as the tri-national committee) was established. This committee is constituted by groups of five municipalities from each country, in Brazil by CONDIAC<sup>3</sup>, in Bolivia by MANCOMUNIDAD TAHUAMANU<sup>4</sup>, and in Peru by the consortium AMFROMAD<sup>5</sup>. The establishment of the committee was supported by ANA (Brazil), the Water Resources Secretary from MMA, CONÁGUA, SOS Mata Atlântica, WWF-Brazil, UFAC, Consórcio Lagos São João-RJ. Representatives from the Foreign Affairs Ministries of each country and also civil society organizations participate in the committee.

In 2004, during the fifth MAP Forum in Puerto Maldonado, Peru, institutions from each country signed an agreement to develop and implement sustainable development activities and research projects, and to promote exchange of information about the region. The institutions<sup>6</sup> involved in the agreement developed a working plan for the management of the tri-national Upper Acre River Basin. This plan involves the following sub-programs:

- social-economic and environmental diagnosis: recomposition models and land use evolution scenarios in the Upper Acre River Basin,
- pilot plan for the recovery of the degraded vegetation in Igarapé Encrenca and Igarapé Bahia,
- environmental education program,
- participative monitoring of water quantity and quality,
- participative management and improvement of water-tortoise fishing,
- institutional strengthening,
- educational campaigns to publish the results,
- erosion and sedimentation control in line with the Acre River plan (MiniMAP Ba-cias 2007).

In 2006 the World Wild Fund for Nature Brazil (WWF-Brazil) organized a workshop with the objective of discussing the legal aspects of transboundary water resources management. Institutions from the three countries were present. After this meeting the Bra-

3 It aggregates the municipalities of Assis Brasil, Brasiléia, Capixaba, Epitaciolândia and Xapuri.

4 It is constituted by the municipalities of Bolpebra, Bella Flor, Cobja, Filadélfia and Porvenir.

5 It aggregates the municipalities of Iñapari, Ibéria, San Lorenzo, Las Piedras and Puerto Maldonado.

6 The institutions involved are: Universidade Federal do Acre, Instituto Nacional de Desarrollo, Instituto de Investigación de la Amazonía Peruana, Dirección Regional de Producción de Madre de Dios, Asociación de Municipalidades de Pando, Interdisciplinaria para el Desarrollo Sostenible e Universidad Amazónica de Pando.

zilian government established the Acre River Working Group in which representatives from ANA, the Foreign Affairs Ministry, state government and municipal governments participate. This workshop resulted in a first draft of the general guidelines to be followed in Acre River Basin management.

GUSTAVO FERRO (2007) points out that the Brazilian side of the Acre River Basin is the one with the better institutional conditions to manage the river basin, while Bolivian and Peruvian institutions lack involvement and management instruments. Besides, Brazil's economy is much more developed and, therefore, the Brazilian institutions have a bigger budget allowing more actions to be taken. There is a great asymmetry between these three countries in terms of economic and political power and institutional development.

The River Acre Working Group was created in 2006 in Brazil, derived from the Trans-boundary Water Resources Management Technical Chamber (TWRMTC) of the Water Resources National Council (WRNC). This group worked until 2010 when it reached its final conclusions and a report was presented to the TWRMTC to be analyzed. This report has the following recommendations:

“The Acre River Working Group, as mentioned below, and with the main objective of contributing to the development and integrated management of the shared water resources of the Acre River Basin propose to the TWRMTC the following actions: a) sending a motion to the WRNC to engage the actors involved to sign a trilateral agreement to the integrated management of the Acre River Basin (Annex I); b) negotiation and signature of a bilateral agreement in the frame proposed in Annex II; c) after the signature of the agreement launch a tri-national seminar to engage the national and local actors to implement the agreement” (translated by the author of SAMPAIO 2010, p. 39).

The Acre River Working Group point out as the main conflicts in the river basin:

“a) the urban water supply and navigability in the dry season; b) floods in the rainy season; c) conflicts about fishing in the “defense” season, due to difference in the fishing legislation in the three countries; d) dislocation of the river bed in the meanders resulting in the physical change in the border, with the possibility of transferring an entire community to the neighbor country; e) irregular use of navigation to transport illegal products; f) necessity to maintain the ecological discharge in the dry season” (translated by the author of SAMPAIO 2010, p. 39).

The seasonal changes in the region cause a great variation in the water regime of all water courses in the Acre River Basin, resulting in alternate floods and droughts that negatively affect the local population. In the dry season the level of the river is so low that water sup-

ply and fishing are impacted. And in the rainy season, usually, houses and neighborhoods are flooded leaving many families without shelter.

Besides, it can be observed that the dislocation of the Acre River bed in the meanders has been resulting in changes in national borders, because the river is the border line between the countries. Thus parts of the border towns can end up changing sides and being transferred to the neighboring state. That is what is happening in the town of Brasiléia (Brazil) that borders Cobija (Bolivia), where a neighborhood has almost been cut off by the river meander and will become part of Bolivian territory. This situation has generated great concern among the municipal governments and population and can be observed in Figure 3.

## **6 International governance in the Amazon Basin: the ACTO**

In addition to the local governance process to manage the Acre River Basin, there is another governance process related to the national water resources policies and institutions in each country of the MAP region. Moreover there is also the international governance process based on the ACTO and its project for the management of the Amazon Basin.

Intergovernmental multilateral cooperation among Amazon countries takes place through the ACTO<sup>7</sup>. However, this intergovernmental cooperation process is extremely slow and sometimes suffers setbacks related to changes of interests or the political context in one of the Member States. There are no connections between ACTO and the border regions; despite ACTO's representative having attended a meeting in the MAP region it did not support the initiative or the tri-national committee with technical or financial support. The cooperation among border countries, without institutions to conduct it, has therefore been informal and carried out through tacit agreements among local authorities in the border localities (MACHADO 2002, p. 258). This is also the situation in the Acre River Basin, as observed through the MAP initiative and the tri-national committee.

The signature of an international agreement among Bolivia, Brazil and Peru is necessary to regulate the actions related to the regional water resources. Although there is already the Amazon Cooperation Treaty (ACT) and the ACTO, the ACT as a framework treaty has a very wide and shallow text that calls for specific agreements about the different subjects that it presents.

Due to the Amazon countries' conflict of interests at the time of the signing of the ACT in 1978, the water resources issue was never fully resolved. The original ambitious proposal of a statute for the management of the common water resources was abandoned with only a pragmatic commitment being expressed in the fifth article of the Treaty:

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<sup>7</sup> The ACTO member states are: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam and Venezuela. France, because of French Guyana, is an observer in the ACTO meetings but not a member.

“taking account of the importance and multiplicity of the functions which the Amazonian rivers have in the process of economic and social development of the region, the Contracting Parties shall make efforts aimed at achieving rational utilization of the hydro resources” (translated by the author from TCA 1978, p. 2, article V).

Articles III and IV of the ACT settled only the navigation issue of the Amazon River. However, in 2002 the recently established ACTO proposed, as its first project, a program to manage the transboundary water resources of the Amazon River Basin. The first phase of this project ended in 2007 and resulted in national reports about the country’s vision of the Amazon River Basin and social-environmental studies. The second phase is still unsettled due to the changing of interests among Amazon countries.

Intergovernmental relations in the Amazon region have been excessively slow and present a lack of connection with the Amazon border regions. In the second phase of the ACTO project two pilot projects for the joint management of Amazon transboundary water resources are proposed, one is in the Napo River Basin and the other is in the MAP region. The inclusion of the MAP region in the project occurred because of the links between the Brazilian part of the MAP initiative and the Brazilian National Water Agency that presented the proposal. Nevertheless, the second phase has still not been launched and the activities in the MAP region will be complicated without an agreement between the three countries to regulate their actions.

Many of the scholars who have studied the ACT and the ACTO have emphasized that the major problem of the organization is the lack of institutional capacity. ALFREDO COSTA-FILHO (2003) points out that the main difficulty of the ACTO is its institutional weaknesses. These include its reduced budget that depends on the member states’ contributions and the situation whereby the Amazonia is unequally prioritized in the eight member countries; the fact that the Permanent Secretary is established without a home office under conditions of budget shortage; the difficulties to create a technical staff under the necessity of attracting foreign financial resources to tackle the problems on a regional scale; and, finally, that the organization is still directed by high level governmental representatives, although they are not receptive to dialogue with Amazon experts or the area’s most genuine representatives (COSTA-FILHO 2003, p. 392).

SOUZA AND CAÑETE (2005) have identified a bureaucratic path that is followed by the ACTO and many other Latin-American institutions. CHRISTIAN CAUBET affirms that there is weakness in the implementation structures of the ACT, because, in spite of its 28 articles, there is no mechanism that allows significant actions (CAUBET 2006).

The sovereignty of the member states is still the major topic in the ACTO meetings. It is evident that the countries are reluctant to engage in new commitments that will lead

to obligations. CAUBET points out that it was political motives that led the countries to sign the ACT, such as guaranteeing the Amazon countries sovereignty over the Amazon region (CAUBET 2006).

ROMÁN (1998) believes that the sovereignty objective was substituted by the sustainable development goal in the 1990s. The emergence of an environmental agenda was perceived as an opportunity for the Amazon countries to obtain financial support for sustainable development projects in the region and to be seen as environmentally concerned countries (ROMÁN 1998).

Other aspects of the ACT and the ACTO are pointed out by COSTA-FILHO (2003), who highlights the obstructing of the cooperation process by the conflict of interests among the Amazon countries and the real heterogeneity among countries' priorities for programs and policies in the Amazon. Problems involving exploitation and conservation of natural resources affect different areas and people in a different way. The relative importance of the national "Amazonia" in relation to the national total, both in terms of territorial area and population density is significantly different in each country, which affects its decisions and priorities (COSTA-FILHO 2003, pp. 385-386).

## **7 National institutions and the national water governance**

The analysis of national institutions and legislation about water resources in Bolivia, Brazil and Peru shows that there are many differences in the degree of institutionalization, decentralization and social participation. These differences may hamper cooperation initiatives because of the difficulty of implementing river basin management without the harmonization of legislation and institutions.

### **7.1 National institutions in Brazil**

Although Brazil has advanced in terms of water resources legislation with mechanisms of decentralization and social participation, there are many implementation difficulties in the Brazilian part of the Amazon Basin, where only one state river basin committee was created. The water legislation is not based in the Amazon context and only some states in the Brazilian Amazonia have their own water legislation.

Water management in Brazil has a recent institutional framework that was initiated with the National Water Resources Policy (NWRP - Law n. 9,443) in 1997. The former water law, the Water Code (decree n. 24.643), dated back to 1934. The National Water Resources Policy (NWRP) set the National Water Resources Management System (NWRMS), whose effective implementation began with the creation of the National Water Agency<sup>8</sup>

<sup>8</sup> In Portuguese it is known as "Agência Nacional de Águas" with the abbreviation ANA.

in 2000. The ANA is part of the Ministry of the Environment as an autocracy, and is in charge of NWRMS implementation together with the state and municipal governments, users and civil society organizations (BRAGA et al. 2006).

The Water Resources National Council (WRNC), the Water Resources Secretary (WRS), the ANA, the Water Resources State Councils, and the River Basin Committees (RBC) and its Basin Agencies are also part of the NWRMS. This system is responsible for decentralizing the water resources planning and management and establishing mechanisms for the participation of civil society.

The RBC is a deliberative entity in which government, users and organized civil society representatives participate. The RBC may use different instruments to manage water resources, such as river basin plans, framing of the water courses, granting of water rights and use, charging for water use, and a water resources information system. There are sub-basin committees and also state and interstate river basin committees.

The RBC approves the river basin plan and establishes the charging mechanisms for water use. In the Brazilian Amazon only the Amazonas State had established a state RBC (BRAGA et al. 2006).

## **7.2 National institutions in Bolivia**

Bolivia has an obsolete Water Law, however in 2006 it established the Water Ministry, which is not fully implemented but seeks to institutionalize water resources management. Both Bolivia and Peru lack financial resources for environmental institutions, which compromises natural resources management. On the other hand, in their documents about water resources management they recognize the traditional community's right to manage their water resources.

According to the Bolivian government's report to the ACTO, the Water Ministry was established in 2006 (Supreme decree 28,631) and is constituted by the Vice-ministry of Basins and Water Resources, the Vice-ministry of Basic Services and the Vice-ministry of Irrigation. Its function is to satisfy the water needs of the population in sufficient quantity and quality for consumption, and also for economic productive activities. The Water Minister is the head of the Social Technical Council and the Water Institutional Council. The Water Ministry intends to implement integrated management to improve access to this resource in a fair, solidary, quality, universal way. It has the strategic aim of consolidating a water resources juridical order to guarantee the implementation of water rights with priority being given to human consumption (ESCOBAR 2007).

Technical and financial support for the integrated management of river basins was provided by the National Basin Program. This program had 4,298,486 dollars investment in the period 2005-2006, from this amount 1,991,070 dollars were directed towards projects in the Amazon Basin.

Generally, it can be affirmed that as far as water resources in Bolivia are concerned, there are serious institutional weaknesses. In accordance with the Bolivian Final Report to the ACTO/GEF Project:

“the institutional framework, in general, in Bolivia has been weak and more formal than real. The governmental institutional framework has been unstable and often sparse. Hopefully the result of the constitutional restructuring process in the country today will establish more clearly the rules and above all the conceptual definitions about water resources that are required by the water legislation. Nowadays, the institutional aspects related to the environment have some degree of fragmentation because there are different governmental institutions with responsibilities towards the environment and natural resources” (translated by the author from ESCOBAR 2007, p. 81).

### **7.3 National institutions in Peru**

Peru has recently changed its water resources management legislation and institutions. The Ministry of the Environment was created in 2008, and in the following year the National Water Authority (NWA) was formed. The Water Resources Law was approved in 2009 and established the National Water Resources System (NWRS), which is participated in by the NWA, the Ministry of the Environment, the Ministry of Agriculture, the Ministry of Habitation, Construction and Sanitation, the Ministry of Health, the Ministry of Production, the Ministry of Energy and Mining, other public entities related to water resources from the national, regional and local levels, the Basin Councils, the operators of public hydraulic systems and private sectoral institutions and water users.

As a technical institution of the Ministry of Agriculture the NWA is the ultimate authority of the National Water Resources System and is responsible for establishing the rules and procedures for integrated water resources management. The country has two hydrographical areas (Pacific, Atlantic and Titicaca) and was divided into 159 river basin or hydrographical units by the NWA. The NWA is a decentralized institution that operates through 14 Water Administrative Authorities, each of which is in charge of a certain group of river basins.

The Water Resources Basin Councils are bound to the NWA and can be established by the regional governments through supreme decree. Their function is to allow social actors

that live in a river basin area to participate in the planning, management and coordination of the water resources use in a shared manner.

## **8 Conclusion**

Although the Amazon Basin has an abundance of water this does not mean absence of conflict. Different uses, seasonal water quantity variation and political boundaries contribute to tensions and conflicts around water resources in the Amazon Basin. Inequalities in the water use and access and in the degree of institutionalization of water management aggravate the situation. The fact that river basins cross state borders is an indication of how difficult it can be to manage water resources on the scale of a river basin.

The analysis of the Acre River Basin in the Amazon demonstrates that there can be transboundary water resources problems and conflicts related to floods, droughts, fishing legislation, pollution, and border issues, some of them associated with the increase in deforestation in the region. These problems are faced particularly by border towns that have engaged in a local governance initiative, but with no support from national institutions (with the exception of Brazil). The lack of coordination between the national and the local scale is especially marked in Bolivia where water institutions, in the form of the Water Ministry, are not well developed and there is an absence of water legislation. Nevertheless, the local governance of transboundary water resources in the Acre River Basin cannot take on further commitments and deepen the cooperation because there is a lack of institutional capacity. This could be enhanced with the involvement of national and international institutions.

River basin management requires coordination among institutions on different scales. However, the case of the Acre River Basin shows that the lack of coordination between international and national institutions and the local institutions hampers water governance and consequently the river basin management. Border towns cannot sign international agreements, only the Ministries of Foreign Affairs with the support of the national water institution can do so.

The MAP initiative proposal to manage the Acre River Basin is a local water governance initiative that demanded the participation of national institutions and even the ACTO in this governance process, indicating a case of bottom-up governance. The ACTO project to manage the transboundary water resources of the Amazon River Basin still has many difficulties to solve before beginning its second phase. The linkage between this project and the MAP Initiative in the Acre River Basin as a pilot project could indicate an attempt to coordinate actions from local to international scales of water governance, if it ever be implemented.

In this case, the international scale is the most fragile in terms of governance and institutional capacity. RIBEIRO (2008) draws attention to the lack of international regulation of water management of transboundary basins since there is no international treaty signed by a relevant number of countries about the subject. The ACTO thus has no international convention to follow, although it could take as a basis some principles already present in international law and experiences in other regions of the world. Moreover, Bolivia, Brazil and Peru could also sign an agreement to form a tri-national committee dedicated to dealing with the transboundary problems and conflicts and especially to manage the shared water resources.

Differences in institutional capacity, legislation and the lack of political cooperation between the Amazon countries and the fragilities of the ACTO as a regional organization are some of the difficulties that joint management of any sub-basin of the Amazon River Basin is facing.

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## **Environmental Inequality Patterns on the Island of Algodual-Maiana-deua. A Q Methodological Case Study**

Götz Kaufmann

### **Abstract**

Regulations to protect Brazil's rainforest have shifted in recent years, from broad global development strategies to more consideration for local needs. This change became evident as the concept of environmental justice emerged. Today, this concept is discussed as a new paradigm in politics and social sciences. In contrast to the older concept of sustainable development, environmental justice has its basis at the local level and has a greater emphasis on social and cultural questions. In the present case study, existing discourses on an environmentally protected island in Brazil's Amazon have been used as examples to discover discourses of environmental inequality patterns in the local regimes. Due to the fact that environmental legislature on the island still fails to address the problem set and that pressing social problems remain, the main discourse differences are assumed to have the capacity to reveal the most pressing unresolved issues as perceived by the involved stakeholders. Q methodology and free unstructured participant observation have been used within the frame of ELMERS' (2007) processual research paradigm to survey traceable and comparable data of environmental problem perception. This tool could provide evidence for three main problems that could be outlined as main causes of environmental inequality in the field, such as waste problems, power inequality of migrants versus the native population on the island, and geographical distance-related knowledge differences. The knowledge problem appears in the shape of cultural and educational differences, which are both framed by a landownership pattern, created by illegal land purchases. In consequence, there is a misdirection of institutional agents, development plan failure and low activity of local (native) civil society. This results in the failure of the well-intended environmental legislature.

### **1 Introduction**

Environmental inequality patterns or the inequality in the local environmental regime<sup>1</sup> are represented by specific conflict lines in different local regimes. To uncover these patterns,

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<sup>1</sup> In extension of FOUCAULT's term of "discourse", "regimes" are denoted generally as how people speak and act with regard to a certain topic or concept. Here, COSTA's (2011) characterization for the "inequality regime" is used as the definition. COSTA distinguishes five (5) arguments: (1) logic of stratification/redistribution defined as static, dynamic or combined, (2) political, scientific, and popular discourses according to which individuals or groups interpret and

the local regimes and hidden conflict lines in a given field must be analyzed and revealed. For that purpose, the undertaken field research assumes that the discourses on environmental justice<sup>2</sup> and sustainable development<sup>3</sup> characterize the environmental regime. Investigating the discourses with regard to these concepts shall corroborate the hypothesis that, if the two named underlying environmental concepts are subjectively understood to differently, the environmental regime prevented from functioning properly. The analysis of the concept's discourse differences will reveal the open and hidden conflict lines in the existing local regimes, which frame the environmental inequality patterns in the chosen field (see below). The two concepts are best placed to highlight environmental problems as they focus together on all relevant involved factors: sustainability and environment, development and justice. Hereby, they are distinguished in top-down sustainable development and bottom-up environmental justice<sup>4</sup>, but they are similar at the same time. As KAMERI-MBOTE and CULLET state, these two concepts have more in common than it seems *prima facie* (1996, p. 1). Since governmental regulation is underpinned by a general basis of acceptance by the people, laws erode or at least do not succeed in functioning as intended if the majority refuses to follow the rules, not just in quantity but also in relation to their power in a given area. Community for instance has much more power in the legislation process when located in the periphery where executive penetration is weaker than in metropolitan areas.

This fact is particularly important in the case of the environmental regime in Brazil's Amazon. Beside the general problem of acceptance, the Amazon area is too big to be totally controlled by executive order (police, military). There are regions in the Legal Amazon that are occasionally far away from the governmental power epicentrum, infrastructure provides only limited access to some fields, and there is difficulty achieving legal penetration and change in areas of traditional cultural heritage and behaviors. As such, this environmental regime does not stand alone. It results from the cultural, territorial, and development regime in Brazil's Amazon, based on long term (post-)colonial history and coloniality<sup>5</sup>.

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construct their own position and that of others in society, (3) legal and institutional frameworks, (4) policies, and (5) models of conviviality in everyday life (segregating or integrating convivial forms) (cf. COSTA 2011, p. 17)

2 In brief, this paper assumes the more critical conception of EJ, which is defined as the question of social distribution of environmental burdens (environmental bads) in consideration of possible institutional racist influence (environmental racism) on this as well as the volume of access to information, governmental services and growing well-being (environmental goods). The EJ concept bases on grassroots protests.

3 Basically, SD is seen as coming from institutional regime, so from governmental initiative, with a concept made to match a broader consensus opinion at a prize of an unclear definition.

4 For sure, this is an abbreviation. Sustainable development has also bottom-up components and one cannot deny the fact that even environmental justice uses top-down policy making to foster their interests. Nevertheless, the genesis of the sustainable development concept is defined by institutions since the UN Stockholm conference in 1972 and the Brundtland report in 1987 whilst the environmental justice concept was created by Afro - US American grassroots movements.

5 For further reading cf. GROSEFOGUEL 2005

Theoretically, the two named concepts must be conceived within the context of their origin. Whilst sustainable development was an institutional construction from above, developed in line of UN conferences by governmental stakeholders, environmental justice emerged at a local level, in practical struggles of (mainly black) communities in the US, suffering from industrial pollution. The two concepts stand for very different approaches towards problem perception: top-down versus bottom-up. Investigating the existing discourses in this field will give insight into the problems faced by the inhabitants. Considering “perceived justice”<sup>6</sup> as elemental concepts for successful policy making, the discovery of inherent discourses is a task for both governmental institutions and environmental sociology. “Perceived justice” describes whether the result of a lawgiving process is considered as fair by the involved stakeholders (MAGUIRE and LIND 2003). As KÖCKLER stresses, “this strengthens, according to the literature, legitimacy and acceptance of the result” (2011, p. 98).<sup>7</sup>

At this point, “social nature” as a concept must be introduced in order to generally frame the people’s ratio in terms of a given environmental problem set. “Social nature” assumes that only those problems exist, which are perceived as problems (cf. in detail KAUFMANN 2012, pp. 31-32). Since acceptance can just arise from an individual’s or a community’s problem perception, a governmentally defined environmental problem cannot count on a community’s support if the definition does not share all or at least most of the locality’s priority list with regard to the respective problem.

These causalities have been tested and analyzed in a research field on an island sibling, called Algodoal-Maiandeuá. The island is located in the municipality of Maracanã, in the federal state of Pará, within Brazil’s Legal Amazon. It is inhabited by both indigenous people and immigrants, and has faced growing threats from outside industries (e.g. industrial fishing, tourism) since the 1970s. In reaction to the increasing tourism, which has resulted in growing environmental threats to nature and people (FIGUEIREDO and SANTANA 2010), the island was declared an area of environmental protection (APA) by Law No 5,621 on November 27, 1990. The intention to create APA Algodoal was to reconcile human activities with the conservation of the wildlife and natural resources by bettering the well-being of the people, always looking for “development, principally based on ecotourism” (SEMA 2010, p. 1). On APA Algodoal-Maiandeuá, two separate sets of data on environmental justice and sustainable development have been surveyed, together showing the discourse differences between the assembled stakeholders. Using Q Metho-

6 Hereby is meant that the perception of an order as just is required for policy making (ITTNER and MONTADA 2009, p. 36). Non-acceptance may result in non-compliance, protests and/or open resistance (MONTADA and KALS 2007). In particular, contrary to general policy research with regard to justice matters, not only the process of equal opportunity, procedural and distributive justice (KÖCKLER 2011, p. 97) as such, but also the result is substantial for the judgment (ITTNER and MONTADA 2009, p. 43).

7 This and the following quotes have been translated by the author either from Portuguese or German sources (see references).

dology (BARRY and PROOPS 1999; PREVITE et al. 2007; DRYZEK 1997) and qualitative data collection (GIRTLE 2001) ideal type discourses could be revealed within ELVERS' "process related research paradigm"<sup>8</sup> (ELVERS 2007, p. 21).

## 2 The field APA Algodual-Maiandeuá

APA is defined by environmental law as a conservation unit of sustainable use. This means that it can be used only by a certain group, in a sustainable manner and always remains property of federal state of Pará. Private land ownership, selling or buying are forbidden by environmental law, to which it only allows sustainable usage by the traditional population there.

The area has 19 km<sup>2</sup> or 2,378 hectare (SEMA 2011). Algodual represents just 385 ha of the whole APA whilst island Maiandeuá has 1993 ha in size (GARCIA DE SOUZA 1999, p. 13). The next and closest island is Marudá, about five km to the West, with about 20,000 inhabitants according to CUNHA (1998, p. 10). There are approximately 2,000 people living on the two islands in four villages: Algodual (on Algodual island), Mocooca, Fortalezinha, and Camboinha (on Maiandeuá island).

The two islands are separated by the channel Igarapé das Lanchas. The huge ecological diversity is remarkable, including century old trees, dunes, freshwater lakes, beaches, mangrove woods and areas that feed a broad variety of animal wildlife species (SEMA 2010, p. 1). Algodual-Maiandeuá is bordered by the Atlantic in the north and by a river-like channel called "Furo do Mocooca" (ALMEIDA DE QUARESMA 2000, p. 150) at Mocooca village in the South. The islands are located between two bays<sup>9</sup>, the bay of Marapanim in the West and the bay of Maracanã in the East. The most famous beach on the island sibling is the one called "beach of the princess", which is also filled with indigenous legends of a creature, described as half cobra and half beautiful blond woman with green eyes, possessing amazing and terrifying power (NASCIMENTO DE PAIXÃO 1993, pp. 59-63).

In 2000, federal law 9,985/2000 governed that residents must participate in managing APAs. §2 creates a management plan within five years after its creation. The resident's participation was regulated in Algodual on July 30, 2007 in Law 7,026. This law created the environmental secretary (SEMA) by changing the dispositions of Law No 5,752,

8 For the purpose of this article, ELVERS' paradigm can simply be defined by a circled process from analysis to transformation, to interpretation to implementation. Since conflict is seen as tool for solution, ELVERS assumes that the circulation continues until a solution is found to which (most of) all stakeholders can agree. Within this paradigm, the tool combination is applied to discourses, analysis and interpretation, whilst transformation describes the process of creating the concourse and the Q sample, imaging reality by discovering the range of existing discourses.

9 As CARDOSO stresses, the "contemporary shape of the island (Algodual) is accompanied by a political dispute between Maracanã and Marapanim about the ownership of the island." (1997, p. 13)

created on July 26, 1993. Most important here are Articles 2 and 4. Article 4 defined the conditions of the creation of a federal council of the environment in incentive A, with the goal to assemble all relevant stakeholder groups in the field (associations, NGOs, governmental institutions, traditional population, newcomers), to consider the new environmental direction<sup>10</sup>. Article 2 gave direction over environmental police forces to the state's secretary of the environment (SEMA), in incentive VI.

The aforementioned council<sup>11</sup> is meant to discuss problems and questions on the island, assembling all institutional agents, as the SEMA, ORLA, SPU/PA, DEMA, IBAMA, SESP, the mayor of Algodoal-Maiandeuá and PARATUR among others. Furthermore, the MPEG and the UFPA are represented. Additionally, nine registered non-governmental associations (ACDESPIM, Association of Skippers, Association of Canoeists, Association of Coachmen, AETA, Association of Inhabitants of Fortalezinha, Association of Inhabitants of Camboinha, ACPAVA, CLIMAM<sup>12</sup>) and three non-governmental organizations (GAF, SUATÁ, GEMA) are organized in the council. Within these governmental and non-governmental actors, some stakeholders have more say than others. The SEMA agent is the most powerful and therefore most relevant stakeholder in the council since the island is formally under control of the environmental secretary due to its financial, political and legislative power. The NGO SUATÁ is also powerful. It is like SEMA based in Belém and led by an argumentative advocate, who has already been able to change conditions on the island regarding waste concern by legal action against the municipality government. Whilst SUATÁ focuses on its activity mainly on village Algodoal, there is NGO GAF which is the oldest<sup>13</sup> existing NGO, and is based and focused on Maiandeuá, and in particular the village, Fortalezinha. Having been fairly influential in the past by conducting campaigns against waste (at least until 2003), migration of their members to other cities have reduced its standing. Beside SEMA and SUATÁ, the executive DEMA, must be considered of crucial importance. In accordance with the law and to administer the APA, the men of the DEMA would be responsible to monitor and execute the existing law. However, it appears that DEMA just exists on paper. Participants in the field observation (GIRTLER 2001) revealed that there are just two ordinary, non-environmental police<sup>14</sup> officers. According to the police representative, they have been sent to fight drug trafficking.

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10 This change in the Amazon environmental regime can be seen by growing participation management structures, which showed an immediate positive impact to all sides by reducing environmental degradation and social conflicts and increasing economic output. The famous study of MCGRATH et al. (2008) for instance showed that fishing revenues grew by 40% due to organized participation.

11 The abbreviations of the following stakeholders are explained in the appendix.

12 Formerly known as ALMA, but then transformed into the above named cooperative.

13 Founded in 1997 (KAUFMANN 2003, p. 82)

14 From this point on the DEMA will be referred to as "police", leaving the contradiction unanswered why representatives of the military police are considered as a DEMA station.

The environmental problem perception of the SEMA, SUATÁ, and DEMA in comparison with the other stakeholders in the field is central for the analysis later on.

### **3 The problem set on Algodual-Maiandeuá**

The problem set is basically a social one. Growing mass tourism has opened possibilities for good business, has attracted people from outside to move to the island to do business and caused pollution at all beaches. Income differentials have always existed, but the disparity of income grew proportionally to the growth of tourism. In the past, the island was inhabited by fishermen and their families, since the 1970s some drop-outs from France and elsewhere moved to the island. Growing tourism in the 1980s/90s led to increased pollution, which necessitated environmental regulation as accomplished in 1990 (see above). Different stakeholder groups became involved in the process of legal regulation, labelled by discussions about the so-called environmental threat. What characterizes this threat to the environment?

Most of the research on Algodual has shown or at least mentioned waste destination as a major concern, caused by both tourists and inhabitants (ALMEIDA DE QUARESMA 2000; KAUFMANN 2003; NAZARÉ DO CARMO BASTOS 1996; NAZARÉ DO CARMO BASTOS et al. 1995, 1997, 2001; CUNHA 1998; FURTADO and ALMEIDA DE QUARESMA 2002; ENDRES 1996). As MERCES DE BARROS points out, the majority of all people on Algodual raised the problem of waste, which has to be resolved for each involved actor in the village (2010, p. 62). This is supported by the representative of the CLIMA, who sees a “great potential of tourism, but this tourism comes along with problems such as drugs in the interior of the island, the waste that emerges after the holidays, and, basically, running water (Ibid, p. 58), therefore we find “no benefit for Algodual with the contemporary sustainable development approach since waste continues to be thrown into the mangrove forests” (Ibid, p. 64). The director of the infant school in Algodual concludes, Algodual has various needs, “but on top is the waste question: selective collection that isn’t made correctly, in particular accumulated in the peak seasons” (Ibid, p. 62). Efforts of the two existing NGOs have been undertaken to better manage the waste problem. Whilst GAF tried in the past to remove the waste by manually collecting tourists’ and inhabitants’ waste in anti-waste campaigns (KAUFMANN 2003, p. 82), SUATÁ successfully took legal action. It succeeded to the extent of organising a cleaning service for the beaches after the seasons, executed and paid by the municipality prefecture in Maracanã. This does not fully resolve the mentioned problem since not all involved actors (as claimed above by Merces) live at the beaches and pollution grows even between the tourism seasons.

Growing mass tourism had two side effects. First, it established a new economic cycle of production. As a consequence, a new circular flow replaced traditional income production (mainly fishing) and resulted in the loss of traditional knowledge. The second

side effect is migration. Due to the new economic cycle, enterprises settle on the island causing inhabitants to migrate. This migration happens for two reasons. First, the general change of economic conditions on the island forces inhabitants to migrate to the cities. Secondly, enterprises and wealthy immigrants buy the property of native inhabitants. These inhabitants move to free space on the island in order to construct new homes, sometimes even in environmentally protected areas. As ALMEIDA DE QUARESMA (2000, p. 182) stated: “Today, such housing standards are difficult to find. The few, which are still living in areas considered as marginal (mangrove areas), have sold their houses to tourists or to migrating fishermen from other locations, mainly from Bragança”. This process has continued to increase during the last decades. This can be observed in the village of Algodoal. Nowadays, the way from the pier to the village is lined with a slum-like area on the right hand side, inhabited mainly by indigenous people. Construction can be found in the mangrove zones at princess beach and on the way (per pedes) from the village of Fortalezinha to the village of Camboinha, and some show signs of willingness to sell land and housing. Illegal selling and buying of land can be found directly in front of both the SEMA office and the police office in the village of Algodoal. Considering the afore-mentioned environmental legislature of restrictions in land usage, this violation of existing law gives reasons to ask questions. Migration and land extraction, which are jointly responsible for the unresolved waste problem on the island, are neither done secretly nor by force<sup>15</sup>. Rather, indigenous people with the right to use the land, but without ownership, are selling it to people from outside. Indigenous people’s migration itself is the internal mechanism causing the process of deforestation. Externally, the deforestation of defined ecological corridors (environmentally protected area specification) is *volens volens* executed by the national project “Light for All”. This guarantees technically electrification of all housings by the national government. By application of the house owner, technicians lay cables, cutting the way through the forest without deference to federally declared ecological corridors.

In response to these facts, the president of the Common Association of Development and Preservation of Island Maiandeuá-Algodoal questioned the contemporary structure of the APA. He stated that the conservation unit’s obligation should not be limited to the preservation of natural resources, but should also include local environmental training and sensitization of the community. Here, a crucial difference in focus on the environmental problem set’s perception appears. A nature focused understanding by the SEMA, who seeks to regulate ecological corridors and limits man-made influence versus a focus

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15 Tourist guides instantly offered me some places inside the mangrove forest to construct simple holiday housings for a price less than 10,000 R\$ including land possession. As an obvious fact, neglect or ignorance of existing law must be assumed. Confronting the responsible legal body for the landownership in Belém (SPU/PA) with the problem, incapability to take action without a management plan was the answer. Furthermore, when asked for “re-socialization” of illegally bought land, the agent expressed the opinion that people, who sell their land for a couple of thousand Reals and waste them the year after totally in a bar, cannot be helped anyway. A new hotel owner, with whom I spoke, said honestly that he was aware of the legal prohibition, but did not believe in the legal authority to take action.

on the interaction between society and nature. He finally concludes, that “no benefit has been accomplished and deforestation increases in the interior of the APA” (MERCES DE BARROS 2010, p. 64, translated by the author). The representative of the association “inhabitants of Maiandeuá island”<sup>16</sup> added that environmental education must be the principle method for taking care of the island. The education should be given by both associations and schools (Ibid, p. 63). The director of the school in village Algodual disagrees, stressing that school has done its part since it is developing an environmental conscience among the people (Ibid, p. 62). MERCES DE BARROS concludes that the obligation for a more environmental education is now up to the public authority and local associations (Ibid, p. 64). Camboinha is a village insulated from both influence and tourism (which are each associated with both environmental goods and bad<sup>17</sup>), and its representative, an indigenous fisherman and long term resident, shares the critique on institutional insufficiency. However, his main interest lies in preserving his community’s cultural heritage (reducing environmental bad), such as Carimbó. In his opinion, environmental education has been successfully implemented, but very few benefits have been transferred by APA creation (Ibid, p. 65). In conclusion, although the inhabitants from different villages reported no benefits on Algodual-Maiandeuá, all inhabitants expressed the following recommendations to conserve Algodual-Maiandeuá: (a) no extraction of sand and stones at the beach, (b) investment in infrastructure, (c) cessation of deforestation, (d) no large construction projects in the villages, and (e) preservation of the environment (Ibid, p. 62). Erroneously or due to failure of information, it is common to hear from some inhabitants as follows: “If there wasn’t an APA, we would have a better transport system” (Ibid, p. 65), as the director of the children’s school in village Algodual said. One solution to the problem set is offered by the directory of the environment in Maracanã and the GAF agent. “First”, the latter’s vice-president pointed out, “we must have support by DEMA, IBAMA, SEMA, and there must be a monitoring by these institutions in order to go ahead.” (Ibid, p. 63)

Another point was expressed beside the waste problem, which is the drug problem, an aspect which comes from families with anti-social behaviour as people in Fortalezinha told already in 2003. These do not just consume cannabis but also a cannabis-cocaine mixed drug called “pasta” (cf. KAUFMANN 2003, pp. 79-80). As one of the two military policemen on Algodual related, their purpose on the environmentally protected area is hunting drug dealers and to fight the drug problem.

As can be seen already, very different perspectives on the environmental problem set consist of different life realities. The failure to consider these different perspectives in the law-making process results in failure to better the lives of the traditional people on the island, even two decades after creation of APA. The question has been perfectly posed by

<sup>16</sup> Unknown in accordance to analyzed official papers and not found at local during half year stay.

<sup>17</sup> Basically the two terms define positive, such as access to information and funding, increasing well-being, or alike (environmental goods) and negative impacts, as pollution, growing pressure etc., on society.

the SEMA agent: development for whom and development for what? Since there is no concluding answer, the institution at the local level, the management council, suggests a reason for this failure: the structure of the council itself. The council was established as the leading organ to deal with the environmental problem set, but has no financial resources or political standing as such. All decisions, made by council members' majority, have to be further discussed and finally decided on a higher institutional level of SEMA's institutional frame. Here is the core of the credibility problem of both the management council and the SEMA at the local level. If only the superior level of SEMA has final decision making power in financial and legislative issues, not the member of the council, inclusively the SEMA agent itself, the work of the council is easily seen as a waste of time when decisions are not approved on the superior level. In consideration of "perceived justice" (see above) to create legitimate order, neither the council nor the SEMA representative on Algodual is accepted since financial support of issues that matter are not approved by the superior levels.

The consequence is non-compliance from inside the institutional structure. One example is the ACDESPIM. As its president related, further participation in the council was refused since the spent time does not find appropriate reflection in the results. Analysis of council meeting protocols showed that this is not a single case. Non-participation of council meetings by many agents was the rule, not the exception. Governmental representative stakeholders from Maracanã and Marapanim<sup>18</sup>, as named by the SEMA, have not participated regularly (SUATÁ 2006).

Another two active governmental stakeholders in the field are not even part of the management council. These are the CELPA and the directory of the environment of the municipality in Maracanã. CELPA runs the above-mentioned national project called *Luz para Todos* (Light for All). It installs electric connections to all houses, regardless of their location. The environmental impacts are enormous. Simply announcing new inhabitants leads to the establishment of an energy connection to their housing. This is part of Brazil's development strategy for the Amazon. Although SEMA criticizes the fact that the CELPA installs electric connections even if the houses are built illegally in declared ecological zones, the question remains unanswered why this important and politically and financially powerful actor is not part of the management council.

As the representative of the environmental directory in Maracanã stated, his institution also, like CELPA, has never been invited to the meetings of the council on Algodual. This is particularly interesting since its establishment two years ago was result of a long term struggle against the municipality governor.

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18 With reference to the above quoted statement of CARDOSO (footnote 9) it can be guessed that these arguments probably point back to inhabitants origins from areas close by, as Vista Alegre and Camará (Marudá and Marapanim) (ALMEIDA DE QUARESMA 2000, p.182).

Another problem is the unequal living conditions of the native people, which can be seen by looking at indigenous inhabitants' quantitative (number) and qualitative (influence) under-representation in the management council. Just two of the nine association represent the indigenous<sup>19</sup> people. On the other side, two (GAF, GEMA) of the three NGOs (plus SUATÁ) in the management council are mostly indigenous. What seems to be a proper representation turns out to be the contrary when looking deeper, since not all listed members are still active or even alive. The latter is true for the GEMA. GAF has had a significant shift in activity. In the past, GAF undertook activities such as practical campaigns against and discussions about waste at beaches, courses, presentations, seminars, and cultural activities for inhabitants with the purpose of environmental education<sup>20</sup> (KAUFMANN 2003, p. 82). GAF also created a structure of environmental NGOs in each village of island Algodual-Maiandeuá. Currently, however, the group only takes part in the institutional structure of the management council. Here, the retreat of local grassroots activities must be seen in correlation with the named institutional weakness of the management council due to its institutional structure. The result is the lost capability of the (economic and political) weakest parts of the community to call attention to themselves.<sup>21</sup> Nevertheless, resistance emerges in non-compliance<sup>22</sup>. This non-compliance is to both sides' disadvantage. The environmental regime doesn't penetrate the whole community and is followed by declining legitimacy of legal authorities on the one side. On the other, it results in phlegmatic passive dealing with the faced problems instead of direct action.

Several qualitative facts frame the disagreement, one of which is the communication problem. As the indigenous agent of the Association of Inhabitants of Camboinha reported, discussions are too abstract to him, and other members of the council do not comprehend his position. This has been confirmed by the Association of Canoeists' agent, a migrated white Brazilian from a metropolis, who also stated that they found it difficult to understand the natives due to cultural and education differences. Hints of the perception

19 Arguments that question the "indigenoussness" of the native population on Algodual have come up several times by other external researchers. Beside the scientific ethical problem of who can speak in the name of the indigenous people, the political issue in terms of heteronomy joins the set. I perceived a difference between native indigenous people, mainly on Maiandeuá, but also on island Algodual, and migrants in respect of appearance, culture and language in all past researches in 2003, 2005, and 2010/11. The strongest argument however is their self-definition, which is why their official legal status or exonyms by other external researchers must not be considered in my opinion. Moreover, by designating them as indigenous people, I value the self-defining right of the people.

20 In the past there have been campaigns against waste and environmental education of the community by NGO GAF, founded in 1997, and formerly active in the field (KAUFMANN 2003, p. 82). These campaigns contained the collection waste and conversations with the other inhabitants as well as a yearly event called annual meeting of GAF (Ibid., p. 83).

21 There is still activity on behalf of the local community. For instance, the NGOs GAF and SUATÁ have elaborated the "Project Environmental Culture", promoted and patronized by the "foundation of telecommunication in Pará", with capacity to teach up to 80 "environmental actors" of the four villages in environmental topics such as environmental education (FIGUEIREDO and ALMEIDA DE QUARESMA 2010, p. 220). These actions are organized in the name of all but some people, who cannot represent all diversified opinions in the field. Clearly spoken, one must assume that the NGOs have their own agenda and their own perception of the environmental problem set.

22 This refers to Jason SHARMAN's statement of global governmental approaches that are powerless against the "weapons of the weak" as used by NGOs, small island states or mediaeval "hold-overs" (2003, p. 2). There is not much one can do against this way of resistance or reluctant participation, besides recognition that attempts will not satisfy—as intended—local requirements and needs without all local stakeholders, in particular the less powerful.

difference regarding the environmental problem set are found in the second discrepancy linked to the goals and state of the art. SEMA stated that the goal of the meetings has been to discuss where to place ecological zones and how to classify the island's surface. According to the SEMA this goal was achieved, with inclusive interest by participants. The indigenous president of the Association of Inhabitants of Camboinha also said that he would have rather discussed the opportunity to get funding for a traditional Carimbó<sup>23</sup> dance festival. Another discrepancy in perception lies in information deficits. As the president of the Inhabitants of Camboinha said further, many people have not participated, since the council has not been able to enact/execute or arrive at any decisions. To evidence his statement, he showed a declaration signed by cabinet deputy Anaice of the PMDB at legislative assembly of federal state Pará. Proposal No /2.005. was signed on September 22, 2005 and claimed the implementation of a project for micro waste composting. This is point one of six agreed schemes and was calculated to cost R\$ 5,000 (about 2,200 €). Others have included the finalizing of water supply (2), construction of a retaining wall (3), construction and structuring of an agency of Banpará (Bank) (4), of mail service (5) and of DEMA (6). As he related, also observable in the field, none of this has been accomplished in the last six years. In his viewpoint, the council has not realised these decisions. SEMA on the other side argued that they have not been the responsible institution for this claim. As can be seen, the institutional competence was not clearly communicated, no one of the SEMA representatives felt responsible to resolve the issue by explaining competences or helping the inhabitants to realize their claims.

Concluding, the management council is committed to meet at least four times in the year. In 2010 the management council did not even meet once, but no one complained. Non-compliance by the stakeholders of the institutional activity on the island has reached the critical level. In consequence, the management council's constitution and institutional pattern must be scrutinised in order to draw a proper picture of the local situation. In the following sequence, the analysis of the outlined problem set will result in research questions and the research method with regard to the inequality patterns that constitute the institutional frame.

### **3.1 Analysis of the problem set and research questions**

Looking at the example of proposal No /2.005., a general problem seems to be the failure of communication. The lack of communication appears in two ways. First, a broad array of governmental and non-governmental institutional stakeholders work in the field of APA Algodoal without having regular communicative connection to each other. Being questioned with regards to the problem of proposal No /2.005., no present governmen-

<sup>23</sup> Along with Pássaros and Boi Bumbá, Carimbó is dance and rhythm, and one of the most important popular culture manifestations in municipality Maracanã (LOUREIRO et al. 1987, p. 12). Three distinguishing parts are characteristic: dance, music and vocals (for further reading: KAUFMANN 2003, pp. 62-63, NASCIMENTO DA PAIXÃO 1989, pp. 77-79).

tal representative in the council (SEMA, SPU/PA, ORLA) had ever heard of this paper. The SPU/PA declared to not to be responsible for this matter, pointing to the SEMA. The SEMA agent claimed that the small scale-use waste composting (1) scheme was rejected due to cost accounting by the responsible legal body, which is not the SEMA. So, even though the SEMA knew about this issue, no efficient communication line to the population via the management council meetings has been established to answer the open question<sup>24</sup>. The indigenous president of Camboinha obviously was not aware of the fact that the SEMA or the management council was not responsible for the proposal. In his opinion the management council was not doing anything, since no one explained to him that the paper he had was only a proposal, and no one informed the people about the progress. Access to information and power is mainly constructing the inequality pattern in the given field. Lack to information applies to both sides and constructs an area of disinformation. The SEMA agent does not know the diverse demands of the people on Algodual, but sees all tasks accomplished, the people do not know or accept the demands and decision-making power of the SEMA, but do not see the use of the SEMA established management council, the CELPA is acting on its own account and the superintendency of the patrimony of the union in the state of Pará (SPU/PA) waits for approval of the management plan before dealing with the existing land property problems on the island. The situation is exacerbated by the division of the inhabitants into an indigenous group of people and migrants. The division is socially and culturally determined, which leads to different courses of action and different perceptions of the environmental problem on the island. Consequentially, the problem of sustainable development is a problem of social justice, a problem of sustainability and a question of the discourse about the field where the particular environmental problem set is settled.

The research questions are:

- What are the underlying conflict lines in the local regimes?
- What do the different involved actors see as the environmental problem on Algodual?
- What do they expect to be done?
- What is on top of their priority list, on which they differ the most?

The two concepts of sustainable development and environmental justice are chosen to cover these differences in the field.

Q Methodology is chosen to reveal the conflict lines, which possibly would be worth discussing in the management council. Even more, the Q analysis will provide the basis for finally interpreting the situation on the island of Algodual-Maiandeuá beyond qualitative

<sup>24</sup> This "distance" problem also applies to the sole native-indigenous NGO GAF with formal settlement on Fortalezinha/Maiandeuá. Already in 2003 decision making meetings have been held in the capital of federal state of Pará, since more members lived in Belém than on Algodual (KAUFMANN 2003, p. 84).

interviews and limiting the common over-identification (GRÜMER 1974, p. 64 and p. 115; GIRTLER 2001, p. 79) bias of ethnographic research.

## **4 Methodological approach**

Q Methodology looks for differences between opinions in the field to reveal what is most distinguished between ideal type discourses. The advantage of this method is in non-predefined opinions, which can be collected from future participants using qualitative methods, categorized by the participants, and then measured by factor analysis. This “method for the scientific study of human behaviour” (MCKEOWN and THOMAS 1988, p. 12) does not link persons over statements, as common factor analysis<sup>25</sup> does, but does it the other way around, linking statements over the participants of the study. As PREVITE states, “Q methodology (...) neither tests its participants nor imposes meaning a priori” (PREVITE et al. 2007, p. 137), but generated ideal discourses are “attributed a posteriori through interpretation” (BROWN 1980, p. 54).

### **4.1 Step-by-step application of Q Methodology**

The application of Q Methodology runs through five steps, from identification of the discourse, to the creation of the concourse, to the development of the Q sample, to processing of the Q sorting, to running the statistics based analysis. After these steps, the data is interpreted in the context of the research (some call this the sixth step). In detail, the first concern consists in identifying a specific discourse and the evaluation of relevant population. Discourses mean how people speak and think about a topic. These are, for example, attitudes towards genetic food and nutrition, animal experimentation or sustainability. Consequentially, the Q research technique is based on the posteriori imposition of meaning by interpretation (BROWN 1980, p. 54). Here, the concepts of environmental justice and sustainable development are chosen as the discourses for two comparative Q studies.

The second step is to develop the “concourse”. What are the subjects of struggle? What is the range of issues relevant to the identified domain? Interview techniques (KITZINGER 1999) are common, as well as naturalistic or ready-made texts (MCKEOWN and THOMAS 1988), often in combination with literature, media reports (DELL and KOROTANA 2000), and photographs (SWAFFIELD and FAIRWEATHER 2000). Even unusual stimuli such as a set of bottled fragrances have been used (STEPHENSON 1953). Finally, numerous (often several hundred) recorded or written statements with regard to the chosen discourse are the result.

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<sup>25</sup> For established factor analysis, participants of studies are subjects and questions or statements are variables. The researcher then looks for patterns in responses across the variables for each person if valuations one and another variable of a certain participant are related (cf. WEBLER et al. 2009, p. 7).

The third stage constructs the imaged opinion range. Here, the so called “Q sample” or “Q statement set” is selected from the concourse. Reduction of countless statements to a manageable size requires a traceable procedure since the “Q set” is meant to be representative for the opinion of the “concourse”. Usually, a concourse matrix is created to categorize and select the representative statements. By representing the range of opinions, the final sample stands for both the limits and the structure of the planned research. Even more, according to PREVITE this process “assists researchers in refining and setting the research question” (PREVITE et al. 2007, p. 137). After this, the research question must have been finally defined in order to commence the data collection. The “Q sample” is of towering importance for the whole application of Q Methodology and the results. Since the Q sample further acts as a condition of instruction for the participants, the selection of final statements must give them the possibility to add individual experiences to their responses. According to STAINTON ROGERS, the triggered “concourse” set is usually reduced by two-thirds (1995, p. 185). The compass of a Q sample is typically between 30 to 60 statements, constrained by time and practicality. Piloting is recommended in order to ensure the essence of opinions or themes discovered and sample duplication, under- or over-sampling is avoided. Some Q sample design techniques are discussed in literature to come to a logical reduction of data. Some include more qualitative elements, named as “unstructured”, which may, according to MCKEOWN and THOMAS, reduce the risk of misunderstandings and misinterpretation (1988) in order to identify themes in which the statements can be categorized and balanced (e.g. the study about national forest management of STEELMAN and MAGUIRE 1999).

As fourth step, the data collection is made by the “Q sorting” process. During this process, subjects model “his or her point of view by rank-ordering Q-sample stimuli along a continuum defined by a condition of instruction.” (MCKEOWN and THOMAS 1988, p. 30). The condition of instruction is a pyramid, furthermore called “Q pyramid”. In the middle, you find “0”, while “distribution marks” are spread out to the left (disagree with most strongly) and right (agree with most strongly). Typical Q studies use an 11 or 13 point scale (PREVITE et al. 2007, p. 139). Depending on the amount of statements in the Q set, this may encompass from -6 to +6 (Ibid., p. 138), -5 to +5 as recommended by MCKEOWN and THOMAS (1988, p. 31) or -4 to +4 in the graphic (BARRY and PROOPS 1999, p. 341). This scale score (or distribution marks) includes one further restriction: the number of statements. The total number of statements is defined by the “Q set”, but differentiated by the Q sort ranking. Centering a high amount of statements in the middle (position “0”) and close by (-/+1; -/+2), usually, the “extreme positions” (-/+3; -/+4) are limited to two or three statements. This isn’t necessarily understood as a ranking from positive to negative, but rather as a ranking within the statements, such as “I like rather this than that”. Therefore, determination of a certain number of statements does not force the participant to show his absolute agreements and disagreements with certain statements, but within

the given frame they have to choose which statement of all given statements they rather or rather not agree with. Another requirement is the number of participants, the “Q sorters”. The set of participants is called “P-set”<sup>26</sup>. Since the method focuses on differences rather than commonalities, large sample size is not relevant. The Q sorting process has more characteristics of qualitative research than quantitative. As SKINNER puts it, more information is gathered studying one subject for 1,000 hours than 1,000 subjects for one hour (1969, p. 112). The final selection is based on pragmatic as well as theoretical considerations. Sorters may be theoretically selected according to their relevance and to the goal(s) of the study, such as membership in an organization (cf. for instance BARRY and PROOPS 1999), or pragmatically as if “anyone will suffice” (MCKEOWN and THOMAS 1988, p. 36). A small number of “sorters” is not disadvantageous, “especially if they seem likely to express a particularly interesting or pivotal viewpoint” (WATTS and STENNER 2005, p. 79). Statistically<sup>27</sup> meaningful results can be generated by as few as 12 participants (BARRY and PROOPS 1999, p. 344). As PREVITE states, in the study of Goldman and Emke only eight individuals have been used, but more common are studies with 30 to 40 Q sorters (PREVITE et al. 2007, p. 139).

After this processing, statistical analysis takes place at the fifth stage. Usually, this is achieved by factor means of analyzed patterns across individuals measuring the most different, distinguishing statements. Thus, individuals which have sorted the statements in a similar way will consequentially most likely share a similar discourse position. Consequentially, the Q methodology creates ideal types, which can be grouped according to positions and then assigned to the individuals. Q researches are then able to draw a distinct picture for each factor array. BROWN (1980) recommends that Q methodological scientists run the collected statistical data from a seven-factor to a two-factor solution before accepting a final solution. This process already assists the sixth stage of step-by-step Q Methodology appliance (see below). Data analysis is carried out with the inter-correlation of  $N$  Q sorts<sup>28</sup> as variables and factor analysis of a  $N \times N$  correlation matrix. Resulting factors represent different viewpoints. Thus, the association of a single participant is indicated by their preferences for a specific factor. The specific factor is given by the correlation result of factor analyzed answers to different statements. Finally, this step consists in calculating normalized factor scores, whereby each statement is scored for each factor.

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26 Important is: the sample in Q Methodology is the list of statements, not – as in ordinary statistical analysis – the number of participants.

27 I will not go deeper into this debate, but there is to be mentioned that “statistical significance” in Q Methodology must not be mixed with ordinary statistical application. Since Q Methodology deals with the inverted bell curve to reveal discourse differences, reference to Q analysis’ significance must be rather seen as interesting hints to the inner-mathematical process than as evidential proof of verisimilitude.

28 Accordingly, persons, not traits or Q sample items, are correlated.

Practically, the analysis can be done most easily by using software like PCA (proprietary) or PQMethod (license free<sup>29</sup>). For practitioners, the Q Methodology mailing-list<sup>30</sup> at Kent University is helpful for everyone, beginners and advanced researchers.

## 4.2 Application

As said above, the concepts of “Environmental Justice” (EJ) and “Sustainable Development” (SD) have been chosen as the discourses in the field. So, two Q analyses have been accomplished in the field with the goal of comparing them. The concourse was created in September 2010, the following data survey was conducted from October to December of the same year.

As P-set, all members of the management council have been chosen. Then, thoughts about composition of the participants and significance of the research came up. Due to the unequal structure of the management council as outlined above, representatives from the native-indigenous population have been added to both collecting relevant statements and the P-set. From this group (twenty-two in total), twelve experts have been chosen to qualitatively collect representative statements of different views on the two discourses. The statement collection has been done by an open question on the meaning of sustainable development and environmental justice on APA Algodoal-Maiandeuá for each person. An unstructured conversation technique was used to let the chosen experts express their behavior as free as possible. This was accomplished in consideration of GIRTLENER’s interview approach (2001, pp. 150-151 and p. 153), which is based on the reciprocal information exchange about day-to-day life experience with regard to the topic. Six of the experts (SEMA agent, director of the municipality’s environmental office, president of SUATÁ, professor from the MPEG, and the secretary of culture in Maracanã, among others) have been asked. Furthermore five native born indigenous fishermen, from the villages of Algodoal and Fortalezinha have been questioned. The questioning revealed twenty-eight statements. Using relevant literature too, a further seventy statements could be found: twenty-five from English literature (mainly GOSINE and TEELUCKSINGH 2008; CLAPP and DAUVERGNE 2005), four from the author’s research (KAUFMANN 2003), and forty-one statements based on Brazilian literature (mainly ROMEIRO 1999; NOBRE 2002; FIGUEIREDO and SANTANA 2010 among others). In total, the concourse contained ninety-eight statements in three languages. For the reduction of the concourse to a manageable size, the discourse matrix of DRYZEK (1997) was mixed with CLAPP and DAUVERGNE’s ideal types of sustainability (2005). The resulting concourse matrix came to twice nineteen statements (Table 1).

<sup>29</sup> download from URL: <http://www.lrz.de/~schmolck/qmethod/>. Accessed: 25 June 2012

<sup>30</sup> register at URL: <http://www.lsoft.com/scripts/wl.exe?SL1=Q-METHOD&H=LISTSERV.KENT.EDU>. Accessed: 25 June 2012

Table 1: Concourse matrix

Total (SD <sup>1</sup> /EJ <sup>2</sup> )	Definitive	Designitive	Evaluative	Advocative	SUM
<b>Market Liberals</b>	3 (2/1)	4 (3/1)	2(1/1)	2 (1/1)	<b>11 (7/4)</b>
<b>Institutionalists</b>	2 (1/1)	3 (1/2)	3 (3/0)	2 (0/2)	<b>10 (5/5)</b>
<b>Social Greens</b>	3 (1/2)	4 (2/2)	3 (1/2)	3 (1/2)	<b>13 (5/8)</b>
<b>Bioenvironmentalists</b>	1 (1/0)	1 (0/1)	1 (1/0)	1 (0/1)	<b>4 (2/2)</b>
<b>SUM</b>	9 (5/4)	12 (6/6)	9 (6/3)	8 (2/6)	38
<sup>1</sup> Sustainable development <sup>2</sup> Environmental justice					

Source: Own survey

Table 2: Q pyramid

Scale score	-4	-3	-2	-1	0	+1	+2	+3	+4
<b>No of statements</b>	1	2	2	3	3	3	2	2	1

Source: Own survey

For the Q sorting, the members of the environmental council plus three native born Indians have been asked to do the sorting of the two Q samples in accordance to the following Q pyramid (Table 2).

Finally, the surveyed data have been analysed with PQMethod (see above) using both the PCA and the Centroid method to find the correct number of four factors<sup>31</sup>, which could be extracted for each discourse. Then, the varimax procedure and automatic flagging<sup>32</sup> was applied to both sets.

### 4.3 Results of the field research

Before beginning the interpretation, the results of Q analysis are displayed first. Two tables show the ideal type discourses as they have been found in the field for both EJ and SD. The tables show the same range of rating in the normalized factor score from +4 to -4 in accordance to the Q pyramid (Table 3).

<sup>31</sup> PCA has been run to either test the significance of the used statement sample and to pre-decide how many discourses might be most fertile. PCA showed that in both cases 6 unrotated factors showed an eigenvalue of more than 1.0, representing 78.5% (SD) and 80.65% (EJ) of all statements in each set. After further manual rotation, four factors have been found in both sets (SD and EJ) as most useful to demonstrate relevant discourses in the field. The four factors on SD and EJ represent 2/3 of all statements (SD: 65.87%; EJ: 65.69%), but in case of SD 36.96% (eigenvalue 8.13) is represented just in the first factor, so, more than one-third of all SD statements are displayed in the first factor. EJ's first factor, on the contrary, represents just 28% (eigenvalue 5.33), so the division of the statements in the four factors is more regular than in the SD set.

<sup>32</sup> PQMethod generally does flagging of a sort anytime its factor loading is  $>2.58 \div \sqrt{N}$ .

Table 3: Ranked statement totals and normalized factor scores

Statements/Discourses		A	B	C	D
1.	Result of the sustainable development process is a community focused on consumption.	-1	+1	-1	+1
2.	A type of institutional innovation to replace economical rationality by a new and distinct cultural rationality would be necessary.	-1	+2	+2	-1
3.	Economic growth is a positive force, which eliminates social disparities for irrelevant ecological costs.	-3	0	-4	+2
4.	The environment is at the absolute limit with regard to economic growth. Therefore, mankind is close to catastrophe.	0	+2	0	-2
5.	Technical progress effectively expands the environmental limits.	-2	0	-1	+1
6.	The environmental problem could be resolved by enduring intervention of public authority, with instruments of control and command.	0	+3	+3	0
7.	Due to the existence of absolute limits, economic growth must stop at some point.	+2	-1	-2	-3
8.	Anthropocentrism has increased in recent years, representing a negative change in mentality.	+2	-1	-3	-1
9.	Development (economic growth) on the island of Algodoal-Maiandeu is accompanied by the increasing happiness of the people.	+1	-1	+1	0
10.	Sustainable Development is the equilibrium (without priorities) of economical (tourism) and environmental development.	0	+4	-3	0
11.	the major goal is to better the process of sustainable development and the status quo of environmental justice is environmental education for the traditional population, which would be much more effective if all governmental projects worked together.	+4	+3	0	+2
12.	Contemporary tourism is the solution to develop the island of Algodoal-Maiandeu.	-3	-2	+1	-1
13.	Drug abuse on Algodoal is an impact of human development.	+1	-3	+3	+3
14.	Prostitution is an impact of the current sustainable development path on Algodoal-Maiandeu.	-2	-3	+2	-2
15.	The development problem is that the natives don't accept persons from outside that come to Algodoal-Maiandeu, even though these people have been living there for more than twenty years.	+1	-2	0	-3
16.	Sustainable Development means to return to the indigenous ways of production (fishing for example) and culture.	+3	+1	+1	+4
17.	The development plan must be created by the inhabitants not by superior government.	+3	0	-2	+3
18.	Because of Sustainable Development I have more options, more liberty and a better well-being (in my socio-economical life).	-1	+1	+4	+1
19.	The only things that Algodoal-Maiandeu is missing are cars.	-4	-4	-1	-4

Source: Own Survey

Table 4: Environmental justice: ranked statement totals and normalized factor scores

<b>Statements/Discourses</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
1.	It is not the nature of humans to want more and more money.	-1	-2	+1	-4
2.	The government has to take more responsibility to create better environmental legislation.	+3	0	-1	+2
3.	The poor are both the victims and the originaters of environmental damage.	-2	+2	-3	-1
4.	Sustainable Development is defined by satisfying the necessities of the present, without sacrificing the needs of future generations.	+1	+1	-2	+3
5.	Institutions cannot solve the environmental question.	-3	-3	+1	+2
6.	The solution for the environmental question is protest from civil society.	0	+1	0	-2
7.	The costs of development are paid by the poor or non-white people or by future generations.	-2	+2	-1	-1
8.	The biggest problem is not the depletability of resources but the consequences of their usage.	0	0	+2	+1
9.	To understand sustainable development it is necessary to consider regional specifics, ideas of human respect, deep knowledge and the love of nature.	+3	+1	+4	-2
10.	In the past, work relations and the relationship to natural resources was based on communitarian rights. Environmental Justice means to re-consider the former understanding.	+1	-2	+3	+4
11.	Development on island Algodoal-Maiandeu is efficient and produces environmental justice.	-4	-4	-1	-3
12.	The failure of environmental justice and sustainable development on Algodoal is significant due to cases of malaria and yellow fever.	-1	+3	0	-3
13.	There are many cases of illegal buying, selling, and ownership of the land. Environmental Justice means to end this illegal possession.	+1	-1	0	-1
14.	Environmental Justice means monitoring of enterprises to provide better environmental services.	+2	-1	-2	+1
15.	The problem lies in the under-representation of the Indians in the participation organs, which are culturally marginalized.	-1	+3	+1	+3
16.	The institutions of the government don't know the needs of the traditional population on the island of Algodoal-Maiandeu.	0	-3	-3	0
17.	The influence of the different stakeholders on the island of Algodoal-Maiandeu differs in accordance to their economical power, this fair since it is the price of success.	-3	-1	+3	0
18.	The majority of people don't have the opportunity to partake in the environmental goods and suffer disproportionately. The conflict emerging from this situation must not be ignored (anymore).	+2	+4	+2	+1
19.	Waste is the major problem in the APA Algodoal-Maiandeu.	+4	0	-4	0

Source: Own survey

In the above listed overview (Table 4), ideal type discourses have been developed from the four extracted factors. For the sake of clearness, one has to distinguish between the two Q Methodology discourses (EJ and SD) and the 4 discourses A to D within the two different discourses. The analysis consequentially results in two times four discourses, which represent the diversity of discourses about environmental justice and sustainable development in the field on Algodoal island. One normalized factor score stands for one ideal type opinion. The most differentiated statements between the Q sorts create the discourse. These are narratively described in the following. For better and more detailed comparison within each set, both tables also provide rounded Z-scores<sup>33</sup>. The result is a proper picture of all the significant discourse differences in the environmental problem set, and are the basis for showing the hidden conflict lines in the field and the inequality patterns.

### 4.3.1 Sustainable development

#### **Discourse A: institutional eco-preservationist, market-sceptical, pro “zero growth”**

The most distinctive argument (7; +2/1.09<sup>34</sup>) of this discourse, and the opposite of all others, (B -1/-0.75, C -2/-0.72, D -3/-1.37<sup>35</sup>) emphasizes the absolute limits to economic growth, asserting that growth must stop at a certain point, since technical progress cannot extend the environmental limits (5; -2/-0.98). This opinion sees increasing anthropocentrism in the community of inhabitants as one of the most defining negative impacts of Sustainable Development on Algodoal-Maiandeu (8; +2/0.68) and does not follow any of the market liberal arguments that see positive impacts of the economic development on an individual (18; -1/-0.57) and by no means at the societal level (3; -3/-1.36). The latter is of special importance as it is the most distinguishing statement in the field and the only one which is declared significant for all four discourses. In other words, all four discourses have labelled this statement as important to defining their opinion, but with a different weighting (3; B: 0/-0.08, C: -4/-2.44, D: +2/0.86). The strong rejection locates this discourse close to discourse C, which rejects the “limits to growth” (C: -2/-0.72) and anthropocentrism (C: -3/-1.29) argumentation uncompromisingly.

#### **Discourse B: environmental admonisher, institutionalist**

This viewpoint defines sustainable development as an equilibrium of human and environmental development without giving priority to one or the other (10; +4/1.58), but also warns that humanity is close to catastrophe due to the economy’s growth since it does not consider the environment’s absolute limits (4; +2/1.35). Very strong too, this perspective rejects the claim of drugs abuse on the islands as caused by human development (13;

<sup>33</sup> Z-scores provide more detailed information about the loading on the single statements than the normalized factor scores do. For comparison of the loadings on statements, Z-scores form a better base for interpretation.

<sup>34</sup> Statement number/normalized factor score / Z-score

<sup>35</sup> Discourse (A to D)/statement number / normalized factor score / Z-score

-3/-1.27). In the end, three statements could be distinguished from the other discourses without tending towards agreement or disagreement. One says that economic growth is accompanied by felicity on Algodoal-Maiandeuá (9; -1/-0.53)<sup>36</sup>. Another does not agree with the claim that the creation of the management plan should rather be done by the inhabitants than by governmental institutions (17; +0/0.09). The same applies to the opinion that economic growth is a positive force and able to eliminate social disparities to the extent of acceptable environmental costs (3; +0/-0.08). All other discourses either agree or disagree with statement 3 (A: -3/-1.36, C: -4/-2.44, D: +2/+0.86). Strong agreements can be found regarding statements that carry a “technical” abstract definition of the concept. Distinguishing “political” concrete statements are not rejected, but commitment is avoided. The “technical” approach of discourse B less considers very local, specific, non-generalizable opinions in favour of a more abstract and scientific understanding of the problem. Nevertheless, this view has inside knowledge to the field problem: drugs aren’t a phenomenon coming from contemporary human development, but from tradition, at least in Fortalezinha (KAUFMANN 2003, pp. 64-65) and there is no argument why it should be different in the other villages. Whether the abuse of drugs is a consequence of human development is questionable as the research in Fortalezinha (2003) showed. The abuse resulted in increasing conflicts based on alcohol and drug consumption (Ibid, pp. 79-80).

### **Discourse C: anti-capitalist, social-liberal, practitioner**

Basically, this opinion is framed by the two strongest statements on each end of the scale. On one hand the discourse rejects positive impacts of economic growth to eliminate existing social disparities at acceptable ecological costs (3; -4 compared to D: +2, B: 0, A: -3). The related negative Z-score weighting is also the most radical position between the extracted discourses (3; C: -2.44 vs. D: +0.86, B: -0.08, A: -1.36). The named statement is not only defined as significant for all four discourses, but is also beyond the scale of all significant (ranging from +1.58 [discourse B] to -1.36 [discourse A]) and non-significant (ranging from +1.894 [discourse D] to -1.881 [discourse D]) statements in the field. The intensity of rejection is stronger than any support or refusal of any other statement in any other discourse. The disbelief in free market forces is accompanied by the strongest support (18; +4/1.50) for more options, liberty and a better well-being (in the socio-economical life). None of the other discourses would disagree with this fact, but none would agree too, and the one discourse (A), which considers this statement as significant, would rather disagree (A: 18; -1/-0.57). The discourse broadly agrees that prostitution is an impact of present sustainable development on APA Algodoal-Maiandeuá (14; +2/0.66). It agrees a bit with the viewpoint that contemporary tourism is the solution to developing the islands, especially because fishing is not a source of revenue in all periods of the year

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36 Appearance of this statement in the discourse is confusing as it also appears in the consensus statement section. It must be assumed that significance of this statement is due to an error of  $P < .05$ . In the next section when the six descending arrays of differences between factors are outlined, this possibility will be taken in consideration to find final answers. If significance applies, statement 9 would appear significantly in factor comparisons that include discourse B.

(12; +1/0.59). The discourse does not agree with the idea that inhabitants of the islands themselves should create the management plan for development (17; -2/-1.09). Sustainable development is definitely not defined as equilibrium without priorities (10; -3/-1.10) and therefore this discourse opposes discourse B, which most strongly agrees with this argument (B: 10; +4/1.58).

#### **Discourse D: market-liberal**

The importance of this discourse results from obvious one-sidedness in defining sustainable development, or rather, the expectations of it. In this understanding, the term stands for economic development without limits to growth in order to resolve the environmental and social inequality problem set (3; +2/+0.86 vs. A: -3/-1.36, B: 0/-0.08, C: -4/-2.44). The predominance of this argument shows the agreement with social inequality for acceptable, since inevitable, environmental costs due to obtained benefits. Also it reveals a strong conflict with discourse C. Whilst C disagrees to this statement (see above), discourse D is defined only by its agreement to this issue.

#### **Consensus in the field**

Finally, the Q analysis provides two consensus statements<sup>37</sup>. The first statement, for which differences have been too small to be relevant – and therefore could not be distinguished –, states that the result of the Sustainable Development process is a community focused on consumption (1; A: -1/-0.18; B: +1/0.19; C: -1/-0.51; D: +1/0.31). The second one recognizes development, or economic growth, as accompanied by the increasing happiness of the people (9; A: +1/0.30; B: -1/-0.53; C: +1/0.38; D: 0/0.21).

### **4.3.2 Correlation between its most distinctive parts**

To outline the conflict lines in the field, all discourses have been correlated with one another. The outcome of this correlation will now be described and analysed in consideration with the above narratives. Correlations between all factors show similarity in a range from -1.0000 (no similarity) to +1.0000 (total similarity, Table 5).

The lowest correlation is between discourse C and D with congruency of just 0.0017. This is obviously in accordance to the findings in the narrative of discourse D. The lowest correlation between extracted factors selects the discourses to look into the appropriate factor array comparison. This comparison will be applied to the environmental justice set as well and shall give further arguments for the outline of the conflict in the final conclusion.

<sup>37</sup> When looking on the single correlations between discourses one cannot find evidence for significance. Differences of statement 9 in all arrays have been below the defined paradigm of relevance, Z score difference of 0.831 in discourse A-B, -0.908 in B-C, and 0.738 in B-D. In consideration of this, delineated significance of statement 9 for discourse B remains in question.

Table 5: Factor correlation

Discourses	A	B	C	D
A	1.000	0.2578	0.0068	0.3755
B	0.2578	1.000	0.0146	0.4369
C	0.0063	0.0146	1.000	0.0017
D	0.3755	0.4369	0.0017	1.000

Source: Own Survey

Discourse C is driven by anti-capitalist and social-liberal behaviour. The high Z-score difference (-3.306) with regard to statement 3 exemplifies an inherent conflict between the inhabitants on Algodoal. On the one hand are those who benefit from the contemporary situation. These mainly have proper resources to establish hotel businesses on the island or other resources compared to the other. As said, Q Methodology reveals ideal type discourses and cannot make a representative statement on people’s opinion. But in fact, the distinction between profiteers and non-profiteers goes along the line of native-indigenous people and migrants. Consequentially, based on the Q sample, most distinguishable statements from the most dissimilar factors (discourses) contain crucial hints to hidden conflict lines that constitute the inequality pattern on Algodoal seeing – like statement 14 – prostitution as a Sustainable Development impact is controversial (C: +2/0.657 vs. D: -2/-1.007). The same applies to the statement, which poses that the development plan must be created by the inhabitants not by the superior government (D: +3/1.337 vs. C: -2/-1.087). The remaining five statements which create the conflict lines are not as strictly opposed by the counterpart. This means that in accordance with the discourse difference, one cannot speak of contradicting opinions, but of strong support from one side and no agreement without disagreement from the other. The first statement points out that the sustainable development on Algodoal means to return to the production and culture of the indigenous people (D: 16; +4/1.894 vs. C: 16; +1/+0.51). In addition, the second statement is rejected seeing the development problem in non-acceptance of people from outside, even though they are living on Algodoal-Maiandeu for more than 20 years (D: 15; -3/-1.549 vs. C: 15; 0/+0.37). The third statement refers to the necessity of having cars on the island. Radical rejection to this opinion typifies all discourses beside discourse C (19; -1/-0.28 vs. A: -4/-1.75, B: -4/-1.58, D: -4/-1.88). Then, having more options, liberty and well-being in the socio-economic life due to the sustainable development on Algodoal is also just stated by discourse C (18; +4/+1.50 vs. D: 18; +1/0.248). The fifth most distinguishing statement defines sustainable development as an equilibrium without priorities of economical (tourism) and environmental development (D: 10; 0/+0.182 vs. C: 10; -3/-1.10).

### 4.3.3 Environmental Justice concept

#### **Discourse A: institutionalist, communitarian**

This discourse emphasizes the waste problem as the major environmental justice problem on APA Algodual (19; +4/2.29). On the other hand, the poor aren't considered as responsible and victims of the environmental damage (3; -2/-1.06). Environmental justice is furthermore defined by the linkage of stakeholder's influence to their economic power, which is not fair (17; -3/-1.45). Also, this perspective disagrees with the point that institutions are not able to resolve the environmental question in this regard (5; -3/-1.07).

#### **Discourse B: institutionalist, environmental racism awareness, eco-analytical**

This opinion is framed within analytical terms on unequal shared costs and benefits, and health issues. Discourse B favours the perception that the majority of the population on the islands is excluded from environmental goods whilst suffering more from environmental bads, and that these impacts create struggles which cannot be ignored anymore (18; +4/1.60). Evidence for Environmental Justice failure on Algodual-Maiandeu is seen by cases of malaria and yellow fever (12; +3/1.18). The inhabitants, who live in poverty, are both responsible for and victim of environmental damages (3; +2/0.93). However, the costs are paid by non-white people and future generations (7; +2/0.76). Furthermore, this perspective rejects reconsideration of outmoded understandings in modern society to establish environmental justice (10; -2/-0.90) as well as the opinion of human nature as always wanting more and more money (1; -2/-1.17). In opposition to discourse D (5; +2/+0.90), which see institutions as not being able to answer the environmental question, discourse B bets on their capacity (5; -3/-1.72).

#### **Discourse C: economical individualism, regionalist**

Discourse C questions that waste is the major problem on islands Algodual-Maiandeu (19; -4/-1.95) and thinks that stakeholders with more economical power should have more influence on processes on Algodual (17; +3/0.98). Environmental justice on Algodual cannot be defined in terms of satisfying the needs of today without sacrificing the needs of future generations (4; -2/-0.90), but by consideration of regional specifics (statement 9; +4/). In consequence to the individualistic perspective of this view, the understanding of the poor as the cause and victims of environmental damage is neglected (3; -3/-1.85).

#### **Discourse D: Sustainable development based environmentalist, Environmental Justice incorporating**

To not sacrifice the needs of future generations by fulfilling present needs, is superior (4; +3/1.24) and accompanied by the belief that work relations and the relationship to natural resources should be based on communitarian rights (10; +4/+1.98). Even though it is not human nature to want more and more money (1; -4/-2.11), no new concept of modernity

(and therefore development) to invent a new form of civilization basing on deep respect to humans, subaltern knowledge (in consideration of Amazon’s characteristics) and love for nature is required either (9; -2/-0.87). Cases of malaria and yellow fever are not the failure for Environmental Justice on Algodoal-Maiandeu (12; -3/-1.10).

**Consensus in the field**

There has been no consensus statement between the discourses.

**4.3.4 Correlation between its most distinctive parts**

As outlined above, the following table reveals the similarity and dissimilarity between the four extracted discourses in the range from 1.000 (100% congruence) and -1.000 (completely contrary).

Table 6: Factor correlation

Discourses	A	B	C	D
A	1.000	0.2714	-0.0662	0.1742
B	0.2714	1.000	0.0433	0.0816
C	-0.0662	0.0433	1.000	0.0409
D	0.1742	0.0816	0.0409	1.000

Source: Own Investigation

Discourses A and C are the two positions on both ends of the discourses’ range (-0.0662). They can be distinguished by communitarian versus individualistic<sup>38</sup> labels. The individualistic perspective is best represented in statement 17, which has been marked as significant for both discourse (C: 17; +3/0.98 and A: 17; -3/-1.45). This statement points out that it is fair if the economically more powerful have more influence. In the Q analytical result of the descending array of differences<sup>39</sup> statement 17 shows the most negative difference at the bottom (-2.432). On the top of this list is statement 19 (difference +4.243). The argument assumes that waste is the major problem on the island. This totally agrees with discourse A (+4/2.29) and is absolutely opposed by discourse C (-4/-1.95). Individual perspective of discourse C disagrees with the statement that environmental justice means monitoring of enterprises in order to provide better service (14; -2/-0.81). The community driven discourse A agrees with this opinion (A: 14; +2/0.76). Five further statements could be distinguished between the two discourses, but are just favoured in

38 One may think about using the term “egoistic” instead of “individualistic”, but egoism seems to me more a moral and evaluative classification which judges without sufficiently considering reasonable rationality, constraints and constellation of customs. Therefore “individualism” here is used in terms of GIRTLE’s 9th commandment of field research: “You aren’t the judge, but only witness of a process!” (GIRTLE 2001, pp. 184-185)

39 Here Z-score differences are calculated to list all statements ordered by their differences (from + to -).

terms of a strong statement by one of them: statement 2, 4, 5, 8, and 11. The first statement asks for more governmental responsibility than governmental institutions actually take. Discourse A favours this argument (2; +3/1.303), whilst its opponent cannot agree to this priority (2; -1/-0.080). Statement 4 is significant only to discourse C (4; -2/-0.90 vs. A: 4; +1/0.16). Discourse C dislikes the definition of environmental justice based on the satisfaction of actual needs without sacrificing the capability to satisfy the needs of the future. A huge Z-score difference (-1.348) can be found on the question of institutional capacity. Statement 5 assumes that institutions are not able to resolve the environmental question on APA Algodual. Discourse A disagrees with this statement (5; -3/-1.07) although discourse B agrees (5; +1/0.28). As opposed to discourse A, discourse C favours problems on resources usage rather than availability of natural resources or their finiteness as defining term for Environmental Justice (8; +2/0.840 vs. A: 8; 0/-0.200). Finally, statement 11 (Z-score difference: -1.191) states, that the development on Algodual-Maiandea is efficient and produces environmental justice. This is absolutely neglected by discourse A (11; -4/-1.745) whilst discourse C does not see the necessity to particular focus on this issue (11; -1/-0.554).

## 5 Synthesis of the results

Four inter-related regimes, which frame the conflict lines, have been found in the field and define the local environmental regime: the institutional and geographic regime on the one hand, and on the other hand the social and cultural regime. The character of these regimes becomes apparent by interpreting the described differences across the discourses and revealing the conflict lines behind the curtain. In the following, these conflict lines will be linked to the named problems of waste and power inequality in order to draw the final picture of the local situation. Herein, keeping the empirical analysis of the Q sorts in mind, the ranked statement totals of SD (cf. Table 3) and EJ (cf. Table 4) have served as a source for revealing the hidden conflict lines, which constitute the inequality patterns on APA Algodual. The following conclusion will show that the failure of APA law on Algodual is decisively influenced by ignorance of these conflict lines.

Relevant statements have been selected, structured and linked to create the problem fields on APA Algodual-Maiandea. These are characterized by the major or influential stakeholder groups<sup>40</sup> in the field: the institutional legal bodies (executive, governmental and non-governmental), the native population, the migrated population and the tourists<sup>41</sup>. Conflict lines in the institutional regime must be seen as differences between legal bodies and inhabitants. The analysis reveals the geographic distance factor in environmental pro-

40 As said in the initial examination, the ideal type discourses and perspectives do not refer to a specific opinion of a real person, neither are they a result of one answer of one representative who has kindly participated in the Q sorting. This examination refers to what is behind the arguments of the persons and must be seen as (certainly) subjective interpretation of the observed.

41 These groups are not identical with the chosen P-set.

blem perception. Hereby, the educational inequality pattern is bound to legal and financial power difference and constructs the first stream of inequality. The second stream is found in the socially different status between indigenous people versus migrants on the island. It reveals the social difference within the group of inhabitants, which again is mirrored in the organizational participation and assertiveness in the existing organization such as the management council. The social inequality pattern establishes the cultural regime which already could be seen when analysing the geographic regime. The single conflict lines will be deduced by looking at statements' weightings in the EJ and SD Q sample.

Starting with the sustainable development Q sample, two statements have been assumed to reveal a possible conflict line, but did not. Both are placed in the consensus<sup>42</sup> statement field. With regard to the "perceived justice" aspect, these consensus statements as the result of the Q analysis are worth discussing: statement 1 points out that the result of the sustainable development process is a community focused on consumption. The second consensus statement, which was found in the field, states that the economic growth on the island is accompanied by increasing happiness (statement 9). Obviously the stakeholders showed no significant difference in ranking these two statements (ranging from +1 to -1). Since statement 9 stands for the perceived result for all inhabitants, the social problem set is too undeniable to be ignored. Therefore this consensus statement could not be considered as true or wrong, as a considerable part of the community is happier than they have been before.

The reason behind describes the first (institutional) regime and is apparent when looking at the loading of the discourses on statement 10 and 11. As the APA regulation stands for an institutional viewpoint (like the discourses A and B<sup>43</sup>), strong agreement with the definition of sustainable development as equilibrium (statement 10) is found there. Local ideal type viewpoints are found in the discourses C and D, which have been described as the anti-capitalist and social-liberal versus market liberal perspective. The institutional regime rather focuses on the strategy of environmental education for the disadvantaged traditional population and the bettering of communication within the given institutions (statement 11). The inhabitant stakeholders are not homogeneous, but are clearly distinguishable from the institutional regime. Clearly, the anti-capitalist and social-liberal standpoint is closer to the native traditional population's position and the market liberal position of discourse D must be understood as statement by the profiteers, mainly the migrants. The institutional regime deals more with a technical concept of sustainable development (statement 10), whilst the inhabitant stakeholders rather refer to practical problems of drug abuse<sup>44</sup> (statement 13). The more anti-capitalist position would add

42 They are not significantly different loaded by the ideal type discourses.

43 Discourse A: institutional eco-preservationist, market-sceptical, pro "zero growth"; Discourse B: environmental administrator, institutionalist; Discourse C: anti-capitalist, social-liberal, practitioner; Discourse D: market-liberal (see above).

44 Consumption of light drugs like Delta 9-tetrahydrocannabinol (marihuana) has been the tradition of the indigenous fishermen on Algodoal when fishing ever since. As the former research on Algodoal could show (KAUFMANN 2003,

prostitution to the problem set (statement 14). As would seem natural, the market liberal position (discourse D) is closer to the institutional position, believing in a solution within the institutional frame (statement 11) and, first of all, sees economic growth, in opposition to all the others, as a positive force, which eliminates social disparities for irrelevant ecological costs (statement 3). Here, it must be added that this viewpoint just represents those migrants who are benefitting from the situation, which mainly applies to the hotel and restaurant owners as opposed to those migrants who came from worse conditions, and the part of the traditional population, whose interest is to catch up with the profiteers<sup>45</sup>. Naturally, the anti-capitalist/social-liberals cannot see any truth in this statement, whilst institutional positions range from no agreement to disagreement.

Here, the geographic (second) regime appears most clearly. The better someone's condition to participate either in the institutional process (statement 11) and/or to be economically successful (statement 3), the more likely will he support these arguments. Since the way of gaining profit contradicts the main goals of the environmental regime, the institutional discourses are closer to the anti-capitalist viewpoint. Both claim more institutional intervention with instruments of control and command (statement 6), which is obviously not in the main interest of the market liberal discourse as they currently profit from the given situation as outlined above. Within the geographic regime, one can see the differences between the two institutional discourses by looking at statements 3, 16 and 17. Discourse A strongly promotes the creation of the required development plan by the local inhabitants (statement 17) and funding of the indigenous production as fishing and culture (statement 16). They disagree with the positive force of economic growth argument almost as strongly as the anti-capitalist position does (statement 3). But they also have differences in the rating of the argument that economic growth must stop due to the existence of absolute limits (statement 7). Discourse A stands close to the external NGO's point of view, such as SUATA and GAF. They do not question the institutional frame, in which they can successfully achieve their results, but rather struggle with direction and focus.

Not much could be said about the social (third) regime that establishes an also influential cultural (fourth) regime. The striking argument against the existence of a social inequality regime would be the surprising fact that the bettering of day-to-day life, which leads to more options, more liberty and a better well-being in the socio-economical life was supported in particular from the anti-capitalist and social-liberal discourse (C) (statement 18; +4). The important contradiction in the revealed conflict line is the idealized perception of the indigenous people as people who are by nature against the today's progress on APA

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pp. 64-65 and pp. 79-80 and pp. 95-97), the drug problem is due to external trafficking and linked to the increasing presence of tourists.

<sup>45</sup> Unsurprisingly, the traditional population is also not homogeneous, but fragmented in different stakeholder groups. That's why the analysis of discourse differences within the field are in this situation more effective than looking for statistical correlation of one group in comparison with the other already known groups.

Algodoal. On the contrary, one can rather speak of a claim to the profit for themselves as they perceive themselves as the losers of the change. They take part and benefit, but not enough in accordance with their right. The participation in the creation of the development is not the important point (statement 17), nor is there a negative change in mentality on the island (statement 8). This opinion rather sees the necessity of a type of institutional innovation to replace economic reality by a new and distinct cultural rationality (statement 2).

Therefore, the statements advocating the EJ concept and a social green perspective (table 1) added social inequality patterns to the findings. Discourses<sup>46</sup> A and B could have been assigned to the institutionalist viewpoint, which has been predominant in the SD Q sample too. Consequentially, the role of institutions in general has a surprising good standing in consideration of the fundamental critiques of practically all stakeholders in the field<sup>47</sup>. Even those, who are criticizing the changes in the SD Q sample, since they cannot claim their portion, do not deny that their life now is better than it was in the past (statement 18), but the most frequently stated argument here refers to the energy lines in all houses. Exactly this fact was criticized by the leading secretary of the environment SEMA (see above) because of the neglect of existing environmental law. This effect albeit is the result of the CELPA and the nation project “Light for All”. Consequentially, the effect, which was named as positive by all is just this regulation that is not the result of the APA regulation. This circumstance is important, since the environmental policy deals mainly with defining ecological corridors and providing better access to the island, but obviously not with the aspect of central importance. In opposition to the institutional opinions, the other discourses agree that institutions cannot resolve the environmental justice problem on Algodoal (statement 5). The distinguishable statements do not support a radical environmental justice position, even though this would have been expected as necessary to protest (statement 6) and focus on the existing illegal land property rights (statement 13). The conflict line is rather across positions in favour of more political influence balance (statement 17) and monitoring of enterprises on the island (statement 14).

The conflict line is between institution based arguments and the economical profiteers of the current situation. Consequentially, the waste problem is presumably rather an issue of the more wealthy people on the island, who either do not perceive or do not have waste as a major problem (statement 19). This is even more interesting since economically weak people are moving to the mangrove trees where waste is not cleaned and serious illnesses (statement 12) grow more likely. This consequence is obviously not perceived as an environmental problem by the participants of the management council plus the native

46 Discourse A: institutionalist, communitarian; Discourse B: institutionalist, environmental racism awareness, eco-analytical; Discourse C: economical individualism; Discourse D: sustainable development based environmentalist, Environmental Justice incorporating (see above).

47 Governmental Institutions among themselves, non-governmental institutions (NGOs) against governmental institutions, and – as could be seen – contrary interests between inhabitants, governmental institutions and NGOs.

representatives from the indigenous population. Problematic cultural marginalization and under-representation in public organs (statement 15) is an issue, but not fundamentally opposed. The result shows that the governing institutions have sufficient understanding about the traditional people's situation at the local level (statement 16). Also the socially unequal sharing of cost and benefits with regard to the environmental problems and the economic development is not significantly questioned (statement 18). Even the classical environmental justice distinction between white and non-white people as inequality pattern (statement 7) consists only by means of differences within the regulated institutional ideal type discourses (A and B). Social inequality patterns establish the cultural regime, which puts the indigenous people at a disadvantage. On the other hand, the refusal to resist this situation also does its part in the existing problem set, even though one conflict line here expresses the demand of re-consideration of past work relations and relationships to natural resources (statement 10), the way to any solution goes through institutional bodies. Even unfair distributed benefits are not challenged at their roots, but opposed by claims to existing institutions to improve their situation within the given frame. The above given example of the lower Amazon lakes (MCGRATH et al. 2008) showed in the presented interpretation a way of better regulation with governmentally negotiated agreements as a result of organized, active and more radical (even militant) activity by the local population. There are no indications for such a process on the island so far. As a matter of fact, the right of the people to better participation is not only legitimate, but well justified. Without direct action and community based and organized activity, even the environmental secretary is not able to act in their interest.

## 6 Conclusion

The research reveals that twenty years of APA have not bettered the situation of the indigenous people on the island (cf. O LIBERAL 2011). This is not only the fault of the leading organization SEMA, but also due to the low activity and the low organizational level of the native population. The leading institution SEMA is required to establish both better information channels between governmental institutions on the island and a functional education system for the traditional people (statement 11 of the SD Q sample). Environmental education would give the opportunity to overcome the existing cultural marginalization and to improve the standing of the marginalized in the community. Cultural service in consequence can provide another type of tourism with enhanced opportunity of profiting from the development. The found evidence of likewise perceived unequal distribution of environmental goods and bads<sup>48</sup> (statement 18 of the EJ Q sample) in the field should lead to thoughts about new development models. Here, the revealed commitment of the local population in favour of environmental education must be taken into consideration. In fact, this might not be enough to really improve the situation.

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48 cf. footnote 2 for definition

Further agreements on behalf of the indigenous people on the island of Algodual-Maiandeuá would require the consideration of their environmental problem perception. Illegal property rights on the island should be discussed by the SEMA. Proposals, such as /2.005., should be re-considered and discussed in order to re-establish lost credibility.

Finally, the analysis shows that the environmental regime must deal with social incentives, which diminish the inequality consequences of the cultural regime. These incentives must be adequate for increasing the living standards of the indigenous population. The awareness of all people in favour of the biological environment (statement 19) covers more pressing social and practical concerns (represented in discourse C). Here lies the principle environmental inequality and the root structure of the inequality patterns. Proper social and cultural incentives would also help to foster the ecological interests of the secretary of the environment (SEMA). The combination of electrification, executed by the project “Light for all”, social incentives for the underprivileged inhabitants and ecological regulation under the roof of a joint council of CELPA and SEMA could be a good starting point.

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## 8 Abbreviations

- ACDESPIM: Common Association of Development and Preservation of Island Maiandeuá-Algodoal
- ACPAVA: Common Artesan Fishermen Association of Village Algodoal
- AETA: Association of Entrepreneurs of Tourism on Algodoal
- ALMA: Association of Food Sellers Marudá-Algodoal
- APA: Área de Proteção Ambiental (environmental protection area)
- CELPA: Central Electrics of Pará S.A.
- CLIMAM: Cooperative of Food Sellers on Island Marudá-Algodoal
- DEMA: Specialized Delegacy on Crimes Against the Environment
- EJ: Environmental Justice
- GAF: Environmental Group in Fortalezinha
- GEMA: Ecological Group Maiandeuá
- IBAMA: Brazilian Institute of Environment and Renewable Natural Resources
- MPEG: Museum of Pará Emílio Goeldi
- NGO: Non-Governmental Organization
- ORLA: The Project of Integrated Management of Maritime Margin
- PARATUR: Official Tourism Organ in the State Of Pará
- PCA: Principle Component Analysis
- PMDB: Party Of Brazilian Democratic Movement
- SD: Sustainable Development
- SEMA: State's Secretary of the Environment
- SESPA: Secretary of State and Public Health
- SPU/PA: Superintendent of the Heritage Union in the State of Pará
- SUATÁ: Association Pro-Island of Algodoal-Maiandeuá
- UFPA: Federal University of Pará

## **Inequalities, Exclusion and Fragmented Urban Spaces**



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*“A rua é nossa, é de todos nós”?*<sup>1</sup>

**Appropriation of Public Space in the City of Rio de Janeiro**

Katharina Schmidt (Hamburg)

**Abstract**

Public spaces are contested spaces. Conflicts in or about public spaces are nothing new to urban societies. There are, however, some more or less recent currents in the area of political geography and critical urban studies that concentrate on questions about aspects and conditions of inequality. In this context they ask, for example, how conflicts in and about public spaces are negotiated and discussed, who takes part in the conflict (and how) and what are the main topics and themes? In strongly differentiated urban societies, like the one of Rio de Janeiro, various social realities confront each other. One consequence of this is the formation of multiple publics, which although they might have similar understandings of what “public space” means, end up pursuing different logics of action.

Two case studies in the city of Rio de Janeiro highlight two conflicts of appropriation of public space. The constellations of the conflicts show how local structures of power and global discourses influence strategies of appropriation of public spaces and also the implementation of certain interests. The focus of both conflict arenas lies on two different kinds of urban social activisms, as possible agents of the right to the city that try to impede the annihilation of public space. A more detailed observation points out how power relations within the constellations of conflict lead to social inequalities, which furthermore contribute to an unequal access to public spaces and to the construction of an unequal right to the city.

**1 Introduction**

Urban public spaces have always seemed to embody the ideal of integration and the convergence of the city as an entity. At the same time these spaces are subject to serious processes of restructuring due to economic change under globalizing conditions and a neoliberal urban development paradigm. The interaction between globalization processes and the dynamics of neoliberal urban development affects urban politics and planning practice that in consequence impact on the use, the appropriation and negotiation of urban public spaces. Current examples of such politics are the manifold programs of urban renewal and security policy discussions. In terms of such policies this paper refers to

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<sup>1</sup> Title of an international exposition that took place in May 2009 in Rio de Janeiro. Translation: “The street is ours, it belongs to all of us.”

inner-city revitalization programs, such as harbor revitalization plans and practices of a so called urban revanchism (SMITH 1998).

Furthermore, within urban societies there are numerous individuals and groups who “demand”, “cry” (LEFÈBVRE 1996, p.158) and wish in many different ways and for many different reasons for urban public space. These “urban social activisms” (SOUZA and RODRIGUES 2004, p. 82) mainly come into action to defend certain values and ideas ascribed to public space or simply to defend public space as a place itself against public or private interventions. Currently there is a strong mobilization of urban social activisms under the label of “the right to the city”, which has its origins in the ideas of the French philosopher and sociologist Henri Lefèbvre. The two social activisms presented in this paper fight against the annihilation of public space in the city of Rio de Janeiro and for their right to the city of Rio de Janeiro. One of them is a kind of citizens’ initiative from the neighborhood of Ipanema, called “Security Project of Ipanema” (PSI). The other is the “Social Movement of the Homeless People in the Center of Rio de Janeiro”. Even the very names and localizations of the two activisms hint at possibly very different ideas of and interests in the public space of Rio de Janeiro.<sup>2</sup>

Against the background of the focus on aspects of global dynamics, urban development and local activisms, the title “*a rua é nossa é de todos nos*” asks whether public space in Rio de Janeiro is being negotiated in a “just” way, if it is actually equally accessible to all, and if really everybody is accepted in a universal sense.

## 2 Public space in urban societies

The idea of what public space actually means is strongly connected to ideas about the distinction between the private and public spheres. Starting with *oikos* and *agora* in ancient Greece, to *publicus* and *privatus* in the Roman Empire, to Habermas’s conception of the “arguing audience” (räsionierendes Publikum) (HABERMAS 1990, p. 98), to recent discussions about virtual public spheres, public space has always had a constituting significance for urban societies. Above all, Habermas’s conception of one single public based on the ideal framework of equal social and economic opportunities continues to be widespread in scientific circles as well as in everyday life (HABERMAS 1990, p. 157).

Yet this notion of the public sphere has been criticized. According to FRASER (2007) “there never was and never should be just one public sphere, but rather a number of public spheres” (FRASER 2007, p. 488). She further points out that Habermas’s perspective idealizes a bourgeois public sphere by ignoring non-bourgeois counterpublics such as popular peasant publics, working class publics or elite women’s publics. Following this

<sup>2</sup> All empiric evidence is based on fieldwork conducted in spring 2009.

argumentation the ideal version of the public sphere is, when it comes to reality, crossed by various processes of exclusion acting through, for instance, categories of sex, gender, class, status, race, wealth and so on.

So if there is not only one all-embracing public sphere, whose public space is it then?

## **2.1 Whose public space?**

Transferring FRASER'S thoughts on the public sphere to public space, BELINA (2001) states that public space also never existed in a universal way that guaranteed free access to everybody. In fact there have always been some forms of regulation or modes of control in or of public space performed, for example, by the state (the police) or by society (norms, school, media...) that determined conditions of access (BELINA 2001, p. 232). For this reason he recommends arguing rather against the annihilation of public space than for the illusion of free access to public space. FRASER'S and BELINA'S arguments show that in the everyday practice of contemporary urban societies, there seems to be no all-embracing public sphere and no universal public space. They rather identify multiple publics and multiple perspectives as well as regulations of public space. This approach then explains why there are growing numbers of manifold conflicts of interest in and about public spaces in contemporary urban societies. Two visions of public space that confront each other in public space are, according to MITCHELL (2003), typical for contemporary urban societies.

On one hand there is the vision of public space "as a space marked by free interactions, user determination, and the absence of coercion by powerful institutions" (MITCHELL 2003, p. 128). This vision is more likely to be found in activist circles, social movements etc. that understand public space also as a political space, which is to be taken and produced by its users. In this sense public space is not foreseeable and thus includes the risk of disorder (MITCHELL 2003, p. 128). In contrast to this perspective is a second vision that follows the idea of public space as "a controlled and orderly retreat where a properly behaved public might experience the spectacle of the city" (MITCHELL 2003, p. 128). This vision can be ascribed to a rather bourgeois public that prefers planned, orderly, and safe public spaces without unpleasant encounters (MITCHELL 2003, p. 128).

These two, here very generally, presented perspectives or visions of public space can be found in numerous urban societies within various contexts and with different focuses. As will be exemplified later in this paper, both visions were observed in the context of the two social activisms in Rio de Janeiro mentioned above. Both groups claim to fight against a (from their perspective) inappropriate appropriation of public space in two different constellations of conflict in Rio de Janeiro. But instead of asking whose public space it is, the question must rather be which interest group gets to implement its own

vision of public space. Why do they succeed and how? Which mechanisms and power relations exist within the particular processes of negotiation of public space?

Before following up on these questions, a brief introduction scrutinizes some of the general conditions, recent dynamics and everyday perspectives in the public space of Rio de Janeiro.

## 2.2 Public space in Rio de Janeiro

Although the notion of public sphere or public space is a “Western” creation, it seems that it has also become accepted in urban societies of the so called Global South. During my fieldwork in Rio de Janeiro the bourgeois ideal of the public sphere seemed to predominate. Nonetheless there are specific general conditions in Brazil, such as the strong socio-economic fragmentation of urban societies, that we can see in the dynamics of production and appropriation of public space. The following sections outline a few aspects of the production and appropriation of public spaces in the city of Rio de Janeiro and its urban society. Three different dimensions consider different perspectives and logics on different scales. On an abstract level there is a scientific perspective that observes recent dynamics in public space in general. The second dimension focuses on the influence of urban development politics on public space, and, finally, two inhabitants of Rio de Janeiro give insights into their everyday understandings and perceptions of public space on a very local and personal level.

### 2.2.1 Recent dynamics in the public space of Rio de Janeiro

The Brazilian author PAULO CÉSAR DA COSTA GOMES (2006) emphasizes the importance of four recent dynamics in public space that, according to him, indicate the end of public space in Rio de Janeiro. The first process he mentions is the **private appropriation of common and public spaces** that exists in various forms. A much cited example is the case of street vendors or car-park guards, who privatize and commercialize public space through their presence and activities leading, in his opinion, to a degradation of public space. Other examples are the expansion of bars by installing tables, chairs etc. on the sidewalk, or the privatization of streets through the construction of barriers and guardhouses (GOMES 2006, p. 178ff.). As a consequence of growing fragmentation in Rio's urban society he identifies the **emergence of territorial identities** that limit the access to and free movement in public space. GOMES refers with this category to the importance of local authoritarian power regimes, such as violent drug trafficking gangs that literally fight each other to conquer urban territory. Nevertheless there are also territorial identities based on social norms and lifestyle regimes, that determine, for example, which sector of the beach suits a particular person (GOMES 2006, p. 181). As a third factor GOMES points to the **immurement of social life** in Rio de Janeiro. Public space is thus rarely used or

enjoyed by middle and upper class members, who seem to prefer to spend their time in safe and exclusive spaces, like shopping centers or private parks, pools, fitness centers etc., some of which are included in their living spaces (GOMES 2006, p. 185). This “avoidance” of public space by these social strata can also be an effect of the significance of the term “public” (*popular*). In Brazil the term “*popular*” includes negative connotations of bad quality or of referring to institutions for poorer strata (like state schools or public health systems). GOMES is therefore worried that public space is increasingly becoming a simple space through which to move to higher strata whereas only poorer strata populate, appropriate and actually use it. Strongly connected to this immurement of social life is the last aspect, referred to as **growth of utopian islands**. Here GOMES points out the strongly homogenous and isolated forms of living in gated communities (*condomínios fechados*), which increasingly lead to an undocking from urban society in a spatial, but also in a social way. Equipped with all kinds of services (sometimes even shopping centers, schools and churches) these forms of living supersede public spaces (GOMES 2006, p. 187).

Yet other authors, such as LOPES DE SOUZA (2008), FREEMAN (2002), ONO (2004), disagree with GOMES’ explanations, saying that the dynamics in the public space of Rio de Janeiro are much more complex and inconsistent than his negative comments suggest. Rather than saying that public space has come to its end, they refer, for example, to public spaces as new territories of sociability and pleasure in Rio de Janeiro (ONO 2004, p. 188), to processes of the revalorization of public spaces through urban development programs (COMPANS 2005, p. 210) or to the traditions of street and beach life in Copacabana and Ipanema (FREEMAN 2002, p. 11). In relation to other urban societies with somehow similar limiting tendencies in public space (Johannesburg for example), SOUZA (2008) highlights the various kinds of activities in and utilization of public spaces existing in Rio de Janeiro. Public space in Rio de Janeiro is, according also to ONO (2004), marked by a vital street life that includes cultural interventions, practices of appropriation, neighborhood markets, festivities and music. She refers to these practices as having a strong social, innovative and creative potential, which demonstrates the power of the citizens by following their own logics of appropriation (ONO 2004, p. 211). Furthermore FREEMAN (2002) ascribes the inhabitants of Rio de Janeiro (*cariocas*) a special relation to public space. From the beginning of the 20<sup>th</sup> century a lifestyle that involved spending time on the streets or at the bar nearby emerged, primarily in Ipanema and Copacabana (also because of the restricted living conditions in the small apartments of the *condomínios* in these neighborhoods). Therefore he states that “although the very rich in Rio de Janeiro are famous for their exclusive lifestyles, many of them have not lost their attachment to the beach and the corner bar” (FREEMAN 2002, p. 11).

In addition to these societal aspects urban programs, such as Rio Cidade in the 1990s, have also contributed to a revalorization of public space through restructuring or recre-

ating public spaces, parks and main streets and thus expanding the public sphere (COMPANS 2005, p. 210).

As one can conclude from these brief explanations, public space in Rio de Janeiro is a very dynamic and complex terrain, where multiple and contradictory developments interfere with one another.

### **2.2.2 Some influences of the urban political framework on public spaces in Rio**

There seem to be two global discourses of neoliberal urban development that currently are promoted by the municipal government in Rio de Janeiro. The first one concerns concrete plans for the revitalization of the harbor area in the center of Rio de Janeiro. The second one, the phenomenon of urban revanchism, mostly known in the form of zero tolerance practices in New York, affects urban life in the city of Rio de Janeiro under the name of shock of order (*choque de ordem*).

#### **The revitalization of Rio de Janeiro's harbor area**

After thirty years of decline, negligence, depopulation and vacancy Rio de Janeiro's harbor area has recently gained importance. New urbanistic plans, like the "marvelous harbor project" (projeto porto maravilha), intend to change the face and the image of the whole area. With this project Rio de Janeiro's government is aiming to implement global standards for harbor areas following international role models such as Barcelona, London, Hamburg or Buenos Aires. Underwater entertainment centers (AquaRio), museums (Pinacoteca do Rio, *muséu de Amanhã*) or the domicile of the Brazilian central bank are being installed in this area (Prefeitura de Rio de Janeiro 2009). According to the mayor Eduardo Paes the objective of the revitalization is to revalorize the historic significance and the touristic potential of the area in order to restore Rio de Janeiro's vocation as a global city and a symbol of Brazil.<sup>3</sup> In this sense the restructuring of the harbor area is strongly based on esthetic politics and high-profile events that more and more determine the utilization and appropriation of public space. Existing urban life in the neighborhoods of the harbor area is being superposed by the revitalization plans and in consequence is often banished. Mega-events like the Soccer World Cup in 2014 or the Olympic Games in 2016 aggravate and accelerate these processes and dynamics in Rio de Janeiro's harbor area.

#### **Zero tolerance in Rio de Janeiro**

Urban revanchism describes urban policies that according to SMITH (2001) entail practices, strategies and regulations that aim at excluding people that are defined as inadequate

<sup>3</sup> Interview with a representative of the IPP (urban planning institute) Rio de Janeiro, 1 May 2011

in a repressive way from public space. The most prominent example of such repressive urban policies is the zero tolerance strategy implemented in New York in the 1990s. There, mainly “homeless people, panhandlers, prostitutes, graffiti artists, reckless bicyclists [...]” were declared as “major enemies of public order” and therefore pursued with “zero tolerance” to reinstall the threatened quality of life in the public spaces of New York (SMITH 1998, p. 3 f). In Rio de Janeiro the recent revanchist strategies function under the label of *choque de ordem* and center on the elimination of urban disorder and irregularity. This strategy draws attention to public space where not only irregular parking, littering the streets, urinating in public and illegal construction are sanctioned. In the name of security and tidiness, as the main objectives of the program, the organized removal of poor strata (street vendors, homeless people etc.) takes place. In the first six months of 2009, more than 3000 homeless people were displaced under the pretext that the street is not a place to stay (CANDIDA 2009).

### **2.2.3 Everyday perspectives on public space in Rio**

Up to this point societal conditions and urban politics and their interdependencies with public space have been taken into account. This section however outlines very individual perspectives on an everyday-based praxis that gives insights into the perception and importance of public space for various inhabitants of the city of Rio de Janeiro. In the course of the fieldwork in Rio de Janeiro the method of photo-elicitation was applied. Three inhabitants with different social backgrounds agreed to take pictures of “their” public spaces in their everyday life. Conversations using the basis of these pictures illustrate different understandings of what public space is (or should be) and how (by whom) it is actually appropriated.

Based on these conversations it becomes clear that, in spite of the different biographic and social backgrounds, the ideal of public space as a space that belongs to everybody and is accessible for everybody is very present. Though, when it comes to the analysis of particular public spaces in the everyday praxis of the dialog partners, processes of differentiation are revealed. The following example shows two pictures of the same public space from two different points of view (Figure 1 and Figure 2). Both pictures show the construction site of the new metro-station at the General Osório Square (Praça General Osório) in Ipanema taken by two different persons from different angles. Furthermore they provide varying explanations and perspectives evaluating the consequences of this impact on General Osório Square as a public space.

Both photographers<sup>4</sup> interpret the construction site of the new metro-station as an intervention in public space and the public life of Ipanema. For Carlos, who is an inhabitant

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4 The names of the interviewees have been changed.



*Figure 1: Carlos's picture of the construction site at General Osório square*

*Source: Photo by Carlos 2009*



*Figure 2: Renata's picture of the construction site at General Osório square*

*Source: Photo by Renata 2009*

of the favela Cantagalo in Ipanema, the intervention is a disturbance of everyday life, because traffic is restricted in the whole neighborhood. Nevertheless Carlos believes that every change causes disturbances and that the outcome may possibly make things easier.<sup>5</sup> In line with his explanations, Carlos's picture shows a location where a lot of traffic problems occurred at the time. Renata, an inhabitant of Ipanema and member of the security project in Ipanema (PSI), refers to the site of construction as a negative impact on public spaces in Ipanema. For her this infrastructural intervention implies direct access from the poorer areas in the north of Rio de Janeiro to Ipanema. She supposes that everybody can easily arrive at the beach of Ipanema and that this will be the end of Ipanema's quietness and familiarity because "people do not know how to behave there" (in Ipanema)<sup>6</sup>. Her picture also shows how concerned she is about the increasing and easy access to public spaces in Ipanema, by focusing on that part of the construction where an elevator from the favela Cantagalo to the General Osório metro-station is being built.

The example demonstrates that different definitions and significations given by the dialog partners are related to their social realities and biographic backgrounds and that these have an influence on their perceptions and also their interest in public space. When personal interests are involved, these individual everyday experiences lead to concrete visions of what public space is or should be, and in consequence who should have the right to appropriate and use it. The ideal of a universal public space then seems to be suddenly forgotten.

In consideration of the multiple interests and visions existing in and of public space, conflicts of appropriation are one possible consequence. The following section will concentrate on two conflicts of appropriation of public space in Rio de Janeiro. Rather than taking into account individual interests, the focus lies on two urban social activists as

<sup>5</sup> Interview with Carlos, 19 May 2011

<sup>6</sup> Interview with Renata, 28 Apr 2011

some kinds of “groups of interest”, their perspectives on the conflicts, and their role in (re)producing public space.

### **3 Two constellations of conflict in the public space of Rio de Janeiro**

Both conflicts of appropriation presented in this paper are related to the urban development programs already mentioned, and moreover are situated within the complex dynamics of Rio de Janeiro’s public sphere. The two social activisms however are fighting – each in its own way – against the annihilation of public space and for their right to the city.

#### **3.1 Case study 1: Ipanema and security**

The Security Project of Ipanema (PSI) is a citizens’ initiative that focuses on the topic of urban order. The initiative was founded in order to fight urban disorder in the neighborhood of Ipanema. The activists’ objective is “to live more securely in a clean and civilized neighborhood and in a clean, civilized city”.<sup>7</sup> To achieve these goals, the PSI engages actively in promoting security trainings, cooperating with the police, organizing committees, demanding and financing equipment for surveillance etc. By highlighting these objectives and measures it becomes clear that the vision of the PSI resembles MITCHELL’S (2003) second vision of public spaces as clean, controlled and safe places, as mentioned above.

##### **3.1.1 PSI and public space**

Furthermore public spaces have a special significance for the members of the PSI. On the one hand members of the PSI understand public spaces in Ipanema as identity sustaining places and symbols for their lifestyle. In fact there is a strong connection between lifestyle characteristics, such as Bossa Nova, the beach (*praia*), the particular way of living (*jeito carioca*) etc. and public space.<sup>8</sup> On the other hand urban disorder occurs especially in public space. To the members of the PSI public space is therefore not only a symbolic and representative space but also a space of conflict where urban disorder materializes. According to some members of the PSI, the following map illustrates the diversity of urban disorder in the public space of Ipanema. Their perception is that one of the main problems is the private appropriation of public space by street vendors, homeless people, beggars etc.

This perceived dominant appropriation of public space seems to endanger and disturb the identification and the ideal of the PSI members as well as their freedom to walk the streets

<sup>7</sup> Interview with Bernardo, 13 Apr 2009

<sup>8</sup> Interview with Bernardo, 13 Apr 2009

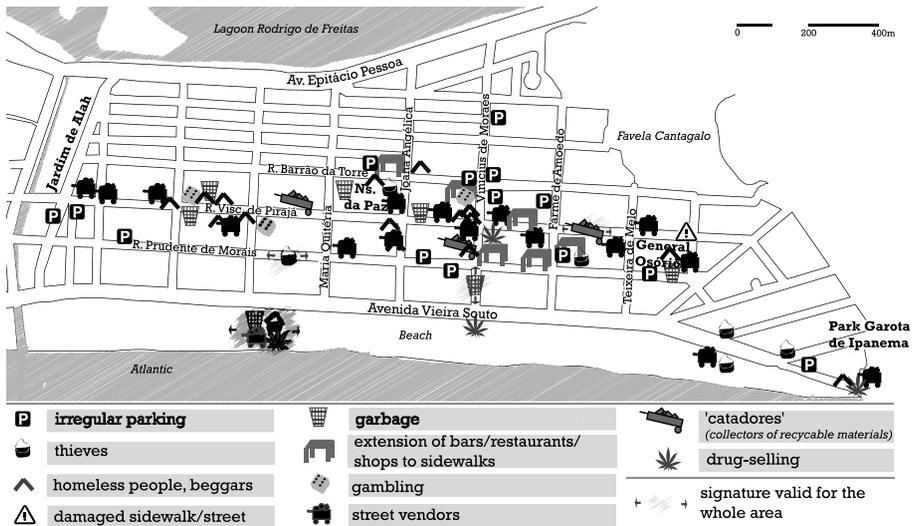


Figure 3: Urban disorder in the public space of Ipanema  
 Source: PSI 2009, Design: K. SCHMIDT 2011

of Ipanema. A member of the PSI explains that the habit of walking to places (as a lifestyle quality) is in danger of disappearing, because it is “unpleasant to meet poor people and street vendors on the street”.<sup>9</sup> The presence of unwanted private appropriation seems to disturb their vision of public space and processes of identification with the traditions and symbols of Ipanema. In consequence the private appropriation of public space is a menace to the objectives of the PSI and furthermore to their right to the city.

### 3.1.2 PSI and the right to the city

Of course it is disputable whether a citizen’s initiative such as the PSI can be an agent of the right to the city as expressed by Henri Lefèbvre, but nevertheless the PSI is indeed claiming its right to the city: “We are losing our right to come and go. We are locked into our houses and housing estates and this is not enough! The citizen has the right to lead a safe and peaceful life.”<sup>10</sup> This interpretation of the right to the city refers in the case of the PSI clearly to aspects of personal freedom and security. Through the engagement of the PSI in local negotiation processes about public space (as just one example) the members participate in the production of public spaces in Ipanema. They realize their right to participate. At the same time the members of the PSI limit the right to participation in Ipanema to a certain public. According to a flyer that circulated in 2009 in Ipanema only “beautiful, bronzed and politicized people” were invited to the meeting of the PSI to demand action

<sup>9</sup> Interview with Bernardo, 13 Apr 2009

<sup>10</sup> President of the PSI in Folha do Centro Rio 2007

from the local government.<sup>11</sup> Under these circumstances it becomes obvious that the PSI pursues a very limited or restricted vision of the right to the city that focuses mainly on small-scale processes going on in Ipanema.

### **3.2 Case study 2: Central harbor area and occupied houses**

In the face of severe housing problems in Rio de Janeiro many houses and spaces in the harbor area were occupied by squatters due to the high vacancy levels and the negligence of this area over a long period of time. In the neighborhoods that are part of the harbor area, a kind of urban social movement emerged, the “Homeless Movement in the Center of Rio de Janeiro”. The residents of four occupied houses<sup>12</sup> – each one functioning as a separate collective – joined forces to fight the revitalization of the harbor area, as planned and promoted by local authorities and private investors. In the context of the revitalization plans they criticize the prioritization of economic and esthetic interests and the real estate speculation that has already led to growing economic valorization of public spaces and thus to the expulsion of the urban life and activities that previously existed in this area.

#### **3.2.1 Homeless movement and public space**

Public spaces, in the vision of the homeless movement, are produced by urban life itself, i.e. they are determined by its users. Restrictions, norms and social control in public spaces mostly affect poor people. For the homeless movement therefore public spaces are important as spaces that respect the presence of and articulation and appropriation by poorer strata. This understanding of public space matches in many points with MITCHELL’S (2003) first vision of public space as a space of free interaction, absence of coercion and of user determination. In contrast to the official revitalization plans the homeless movement promotes the idea of an alternative revitalization. One strategy of this alternative revitalization refers to social housing as an important way of revalorizing urban public spaces in this area. These diverging visions and interests between local authorities (including private actors) and the homeless movement in the center of Rio de Janeiro are leading to conflicts of appropriation in the harbor area. The following map (Figure 4) visualizes the interests of the involved actors in the harbor area.

The homeless movement in the center of Rio de Janeiro perceives the local authorities and entrepreneurial actors with their plan of revitalization as dominant appropriators of

11 Flyer PSI: “Ipanema é terra de gente bonita, bronzeadas e politizadas. Participe de nosso encontro para ouvir e cobrar ações do poder público para nosso bairro.” (PSI 2009)

12 At the time of the fieldwork there were four active occupations of houses in the homeless movement in the center of Rio de Janeiro: Chiquinha Gonzaga, Quilombo das Guerreiras, Machado de Assis, Zumbi dos Palmares. The occupied houses represent a very volatile issue. All occupations underlie various dynamics and processes. To date the occupation Chiquinha Gonzaga is the only one to be legalized. The occupation Quilombo das Guerreiras succeeded in negotiating relocation whereas the occupation Machado de Assis was “abandoned” and members of the Zumbi dos Palmares were paid out by the municipality or evicted by the police.

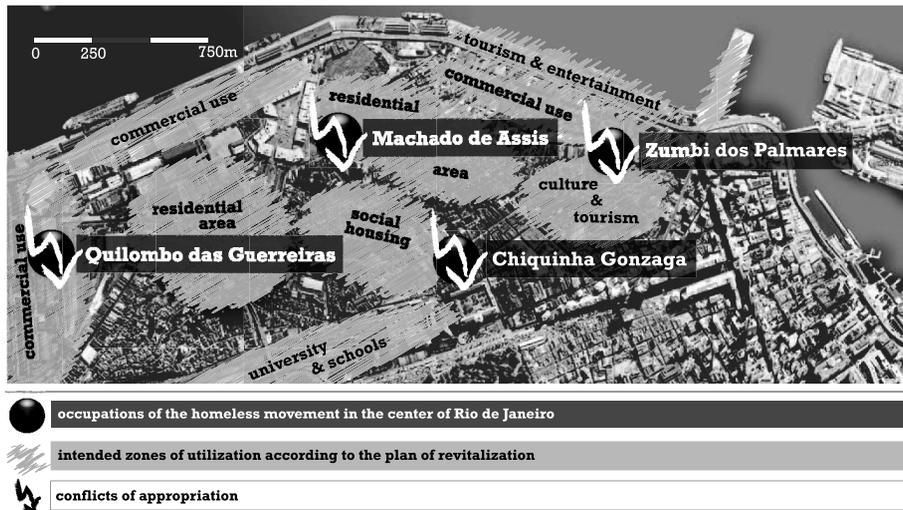


Figure 4: Conflicts of appropriation in Rio de Janeiro's harbour area  
 Source: IPP 2009, Prefeitura da Cidade do Rio de Janeiro 2009,  
 Design: K. SCHMIDT 2011

public space in the harbor area. Their planned visions affect the living spaces of the homeless movement (and many more). The occupations of the homeless movement thus fulfill not only residential needs but also social functions (that once used to be public) in the harbor area by offering educational programs (literacy, health...), a day nursery, cultural events etc. for the surrounding neighborhoods. Figure 4 demonstrates clearly that in the harbor area these different visions collide with each other, forming a special conflict of appropriation. The dominant appropriation of public space by private actors and economic valorization represent an annihilation of public space in the harbor area for the homeless movement and is in the end also a question of surveillance.

### 3.2.2 Homeless movement and right to the city

This dominant appropriation by powerful actors and plans elicits the impression that there is an uneven logic of the right to the city in Rio de Janeiro. An inhabitant of the occupied house *Quilombo das Guerreiras* states in this context that the determination of spaces is a top-down process. She argues that the capital owns the best spaces and that poor people are left with only the *baixada* (periphery of Rio de Janeiro) or places where rich people do not go.<sup>13</sup> The right to the city that the homeless movement claims in the harbor area of Rio de Janeiro refers explicitly to the continued presence of poor strata in the harbor area. They are literally demanding the right not to be displaced from the center to the

<sup>13</sup> Remark of an inhabitant of the occupied house Quilombo das Guerreiras, 24 Mar 2009

periphery, as Lefèbvre argued already in 1968 (LEFÈBVRE 1996, pp. 18, 42, 195). In so doing, they do not call only for the right to participate in urban processes, but also for the right to difference, appropriation and totality in Rio de Janeiro. The homeless movement therefore can be interpreted as representative of a rather broad vision of the right to the city, considering the city as a complete work (*oeuvre*) (LEFÈBVRE 1996).

#### 4 Discourse and power in public space

Without aiming to construct a comparison between the two particular constellations of conflict, a brief recapitulation demonstrates some aspects, structures and mechanisms that concern both case studies. As already mentioned both urban social activisms act in order to fight the annihilation of public space. In spite of their different objectives and ideologies though, there seem to be logics of action on an abstract level that resemble each other. In both of the constellations of conflicts the claims of the urban social activisms are directed to the municipality as principal addressee. As actors involved in the constellations of conflict, each urban social activism represents “the public” as an involved party of conflict. Whereas the PSI with its objectives and socio-economic background is related to a privileged public, the homeless movement in the center of Rio de Janeiro rather belongs to a marginalized public of the urban society of Rio de Janeiro. As such publics they both defend their vision of public space and accordingly their notion of adequate appropriation. In the case of the PSI it is the idea of public space as a clean, organized and controlled space, which stands in contrast to the vision of public space as a space of free interaction and user determination as understood by the homeless movement in the center

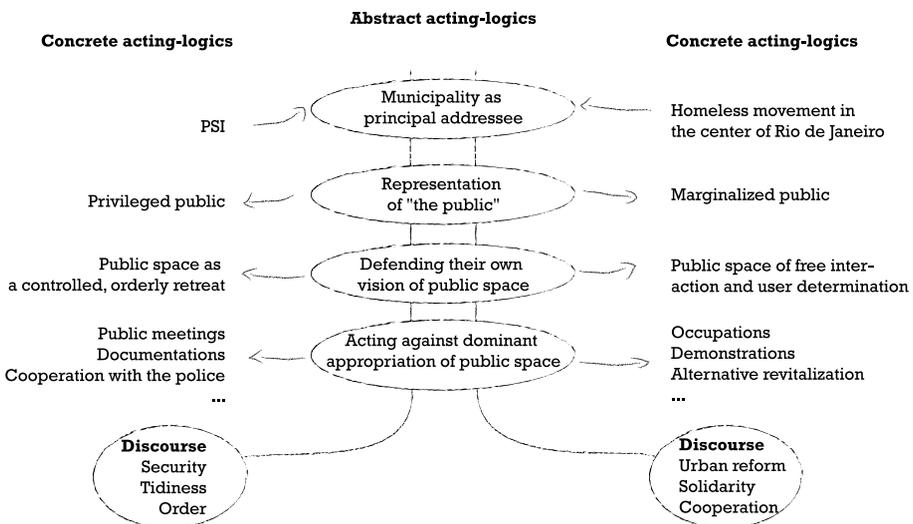


Figure 5: Acting-logics in the constellations of conflict  
 Source: Design: K. SCHMIDT

of Rio de Janeiro. Furthermore both urban activisms act on behalf of their possibilities, ideals and objectives against the perceived dominant appropriation of public space. The strategy of the PSI involves public meetings, documentation of urban disorder, reports to the police etc., whereas the homeless movement focuses on the occupation of vacant buildings, demonstrations and promoting ideas of an alternative revitalization.

While on an abstract level there is a considerable degree of accordance in abstract logics of action, in the concrete sphere there is differentiation in tactics, visions, constitutions, and articulations etc. of the urban social activisms. Consequently what separates the two urban social activisms from each other, and at the same time determines their inherent logics of action, are the discourses they pursue. The observation of the different discourses reveals how they affect the outcome of the constellations of conflict effectively.

Concerning the first case study in Ipanema it is quite obvious that the PSI, but also the local authorities with their objectives, follow the discourse of security, tidiness and order. The PSI is therefore generally in line with the political strategy and the urban development programs in Rio de Janeiro. The demands and interests of the PSI lie within the discourse of the municipality and as a result the PSI has good chances of implementing or integrating its own visions into public space or the urban development programs. In fact the PSI participates, by pursuing its vision, in the reproduction of the hegemonic discourses in Rio de Janeiro.

The situation is different in the second case study in the center of Rio de Janeiro. The homeless movement does not follow the hegemonic discourses in Rio de Janeiro. It rather refers to counter-discourses, which in this case are alternative discourses such as discourses of urban reform (*reforma urbana*), solidarity and cooperation. The problem is that the counter-discourses criticize and reject the dominant practices of the municipality, although the municipality still is the main addressee for the demands of the homeless movement. This situation creates a tension that results in a confrontation of the different narratives and in the end leads to a blockade of the interests of the homeless movement. Due to these uneven power relations in the constellation of conflict, the homeless movement cannot impede the dominant appropriation of public space, or enforce its visions. Compromises between these opposing interests are very rare. Therefore the homeless movement takes and stays in the position of reproducing counter-hegemonic discourses. As a consequence members of the movement try to construct autonomous spaces to resist the dominant practices, for example through occupation.

Of course the PSI is not always in line with the municipality and sometimes also the homeless movement and the municipality cooperate with each other. However, the examples discussed bring together (here in a very condensed version) how global discourses can affect the very local and everyday level in the urban society of Rio de Janeiro. At the

same time they reveal existing power relations in the constellations of conflict, which in the end determine decision-making processes. The brief recapitulation of the two case studies reveals the uneven access(es) to power. Whereas the PSI seems to be in a position to play a part in decision-making processes, the interests of the homeless movement are not taken into account. In contrast they are rather subordinated to the interests of tourism, commerce and entertainment, as the removal of the occupation *Zumbi dos Palmares* from the harbor area in 2010 has shown.

## 5 Bringing it together: Appropriation of public space, urban social activism and the right to the city

As the two case studies demonstrate, Rio de Janeiro's urban society is fragmented into multiple publics, with different statuses of legitimacy. Categorization into differently valued publics, like privileged or marginalized publics, (re)produces structural inequality that constitutes power relations in the urban society of Rio de Janeiro. From this point of view an uneven right to the city can emerge as a consequence of structural inequality. Such constellations of conflict reveal that the right to the city is a question of power relations. Negotiation processes in conflicts of appropriation of public space therefore always involve power relations and a variety of interests and publics that confront each other. For this reason the question "*a rua é nossa, é de todos nós?*" that forms the title of this paper can be answered in the light of the explanations given: "The street doesn't belong to all of us" or "it belongs to all of us, but unequally". As long as there are multiple publics and fragmented urban societies there is no universal "us" and therefore public urban space is and probably will for some time remain a contested urban terrain.

Following this argument, the "concept" of the right to the city can be fruitfully used in the context of critical urban studies to focus on constellations of conflict. Within these it contributes to analysis of inequalities by observing intentions, interests and interdependencies of the involved parties of a conflict that give information about existing power relations in particular contexts. In turn this information provides insights into the production and (re)production of urban (public) spaces.

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**Everyday Security-oriented, Safety-seeking Practices  
and their Spatial Manifestation in São Paulo.  
A Discussion of a Current Case Study's Preliminary Results**

Dominik Haubrich (Kiel)

**Abstract**

A massive expansion of different forms of personnel and technical security measures like electronic fences, 24-hour alarm systems, monitoring, and security cameras in non-gated neighborhoods of the broad Brazilian middle class illustrates the most recent transformation of the commercial security market in Brazil. It goes hand in hand with the growing importance of all kinds of safety aspects and security measures in everyday activities, which is mentioned by selected interviewees living in residential areas in the south of the municipality of São Paulo. Using the analytic triad “security-certainty-safety” of BAUMAN’s *Sicherheit*-concept (1999), the paper aims to identify different types of security-oriented and safety-seeking practices and attempts to discuss, in particular, applied security camera systems in addition to other self-protection mechanisms and their impact on individuals’ feelings of (in)security.

**1 Introduction**

In Latin America, the commercial market of electronic security measures is growing at a very high rate. Brazil has now become the world’s fifth largest commercial security market. In 2009 R\$ 15,000 million were generated in sales of technical security equipment, representing a 20% annual growth in this market.<sup>1</sup> The spread of security measures like video and surveillance cameras, electronic fences and gates, or 24-hour alarm systems operated by private security companies, goes hand in hand with extensive quantitative and qualitative changes in the commercial security services, especially in post-industrial urban areas. On the one hand, these transformations are reflected in an increasing expansion of private security stakeholders in public, private and semi-private space (cf. CALDEIRA 2000; PAOLINELLI 2007), as well as being characterized by a high degree of informal security services and arrangements (cf. ZANETIC 2010).

On the other hand, even though the commercial market of security services was primarily dominated by security staff guarding banks and industrial units until the 1990s,

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<sup>1</sup> Financial Times 08 June 2010: “G4S buys into Brazil security market”

nowadays the expansion of all kinds of commercial security services and measures can be observed in different areas of everyday life (cf. FEIGUIN and LIMA 1995; ZANETIC 2005). In the context of São Paulo, this dynamic expansion of technical and electronic security measures can be accurately described as the *alphavillization* of publicly accessible residential areas of a broad Brazilian middle class. This expression is derived from Brazil's largest gated community, located in the periphery of São Paulo's metropolitan area (cf. WILLIAMS 2010). Due to technological innovations in the market – particularly the improvement caused by the use of the internet, which led to a reduction in the cost of buying and installing the surveillance hardware – electronic security measures are becoming more “affordable” and, at the same time, more “accessible” for an increasing middle class as the new clientele.

Furthermore, it has been observed that many residential and residential-related security practices are based on a collective feeling of uncertainty during everyday activities and a strong need for producing greater individual security. As known, the spatial and functional manifestation of these phenomena is related to the ongoing construction of and continuous migration to enclosed housing units like gated communities and condominium buildings, which was mainly discussed in the academic field in relation to the “fortress mentality” (cf. BLAKELY and SNYDER 1999) of the upper middle and upper class and their residential priorities like security, status, community-sense and lifestyle (cf. ATKINSON and BLANDY 2005; GLASZE et al. 2006; WEHRHAHN and RAPOSO 2006; for Latin America: cf. CALDEIRA 1996; JANOSCHKA and BORSODORF 2006). At the same time the increasing installation of different forms of technical security measures, mentioned above, has recently also spread into different, non-gated neighborhoods all over the metropolitan area of São Paulo and seems to indicate a new development, which goes along with a growing importance of all kinds of safety aspects and security measures in individuals' everyday lives. Against this background, this paper aims to discuss the relation between the (growing) pervasive presence of security services and measures particularly regarding the application of electronic security measures as an additional self-protection mechanism. Which types of everyday security/safety practices can be observed? And which importance do they get in daily life?

## 2 Analysis approach

Issues related to the implementation and application of new electronic security measures in particular, and the questions of (in-)security in urban areas more generally, have become a controversial topic in social sciences and particularly in urban geographic studies and security studies in recent decades. Interdisciplinary-oriented studies often deal with later neoliberal security policies' programs and fields of actions, and their connection with the vested interests of the political and economical élite (cf. GLASZE et al. 2005; EICK et al. 2007), the implementation of order and control policies (cf. BESTE 2004; WEHRHEIM

2006; PÜTZ et al. 2009), the multi-dimensional emergence of citizens' feelings of insecurity (cf. LÜDEMANN 2006; REUBAND 2010), the instrumentalization of unsafe spaces as part of a strategy to formalize social control (cf. BELINA 2006), and various forms of (self-)control and governance (cf. BRÖCKLING et al. 2011).

Studies about private and public security measures and strategies seek, in part, a theoretic embedding in the discussion of the society of discipline, control, and security. Based on FOUCAULT's (2008) reflection about the *panopticum* as a disciplinary technique of the 19<sup>th</sup> century prison, DELEUZE (1992) interprets the increasing implementation of public video surveillance (CCTV) as a ubiquitous public infrastructure in the 20<sup>th</sup> century as an indication of the fluent transition to a society of control. For LEGNARO (1997) and later SINGELNSTEIN and STOLLE (2008), the shift from reactive to preventive control strategies, as well as the increasing prevalence of private security actors at the beginning of the 21<sup>st</sup> century, finally illustrates the transition to a society of security.

Specific structural conditions, like the increasing disintegration of social relationships, the restructuring of the welfare state, the precariousness of working conditions, as well as the loss of sovereignty of the modern nation state (depending on the specific country context) form the contemporary framework of non-specific insecurity which can be observed in postmodern and late-modern societies. According to BAUMAN's (1999) reflections, a loss of *Sicherheit* is being constituted at the centre of an increasing structural vulnerability and a rise of violence phenomena. In the English source text BAUMAN uses the German term *Sicherheit*, which he sees as consisting of three forms: *security*, *certainty* and *safety*. *Security* refers to personal property and describes the feeling of keeping everything that has been won or purchased. *Certainty* equips individuals with the assurance to make everyday decisions based on reliable knowledge. *Safety* as the third element of *Sicherheit* guarantees the protection of everyone's body and personal space of action from any kind of danger (BAUMAN 1999, p. 17). To BAUMAN, all three ingredients of *Sicherheit* build the condition of self-confidence and self-assurance. Ultimately, they equip individuals with the ability to act and think rationally. However, at the same time, if one ingredient of *Sicherheit* is lacking or absent, the basis is built for the correspondingly opposite effects: caginess, fear or existential mistrust.

Daily routine, behaviors and habits of all ingredients of *Sicherheit* are constantly attacked because every agent is confronted with the intractable dilemma "choice/undesirable consequence" or, as GIDDENS puts it (1994), the "if/then-contemplation". The effects of weakened security, certainty and safety – as a concomitant but indistinguishable symptom – lead to unspecific fear (BAUMAN 1999, pp. 17-19) or manufactured insecurity (GIDDENS 1994). "Once visited upon the human world, fear acquires its own momentum and developmental logic [...]" (BAUMAN 2007, p. 9). Everytime social agents make an effort to combat the sense of fear and disorder by defensive behavior (construction of walls,

engagement of security guards, armored cars), it contributes towards both reaffirming and helping produce such a sense. Fear has already been incorporated by everybody's mind, it penetrates everyday life and does not need any external stimulation, since activities and defensive behaviors which are related constantly to the sense of fear in the end reproduce fear itself (BAUMAN 2007). The collective fear of crime plays an increasing role in daily routine (cf. LEE 2007; GROENMEYER 2010), which – it is claimed in this paper – grasps the ingredients of *Sicherheit* while structuring daily life. Studying security-oriented and safety-seeking practices leads to the empirical necessity to focus on “a far more dynamic and contested sphere” (cf. BENNETT 2005, p. 3) of everyday routine activities of individuals (households) and raises the question about which security aspects can be observed in ordinary settings.

### 3 Empirical observations

In terms of political, economic and social context, Brazil is still characterized by large socio-economic disparities leading to socio-spatial fragmentation, structural problems related to the ongoing democratization (since 1984), a weak state monopoly on the use of force, a government budget in rather poor financial straits, and general governance problems (cf. ADORNO 2007; COSTA et al. 2010). Since the 1980s, referring to the case of Brazil and Latin America in general, crime, violence and (in-)security issues have occupied an important place in the public debate (cf. PEETZ 2007; UNGAR 2007), and have evolved into one for the key problems of politics and society (cf. ROTKER and GOLDMAN 2002; DAVIS 2006), accompanied by the complex crime and insecurity situation, particularly in urban areas. The state, acting on behalf of public and municipal stakeholders, is thus unable to provide public order and safety (cf. ALVES 2009). These circumstances of public governance force a redefinition of the fields of action and the instruments of security and criminal policy, as well as the involvement of non-public agents in public order and safety concerns (cf. ZALUAR 2007; FRÜHLING 2009). In Brazil as the “país dos vigilantes” (security guards' country), the ongoing privatization of public safety issues is revealed by a clear shift of the ratio of public to private security agents (cf. MUSUMECI 1998; SOARES 2003). From the 94,000 private security agents employed in 250 officially registered private security companies in the State of São Paulo in 1994, the official number rose to more than 326,000 agents in 2004, in contrast to the only 108,000 public agents registered at the same time (cf. ZANETIC 2005). At the federal level, the number of private security agents (>2,000,000) even surpasses the public agents (<600,000) by one to three times (data: Polícia Federal 2010).

Within the Brazilian academic debate, three key aspects are used to explain the growing demand for security services. Firstly, the presence of daily violence and menace is considered to be the general concern facing the country; a phenomenon that started to appear during the 1980s and which continued to intensify during the following decades

(cf. AGUERRE 2004; HINTON 2006; KAHN 2010). Between 1980 and 2000 the homicide rate increased by three times on the federal level, although, after 2000, it was followed by an exponential decline in the number of homicides, especially in the metropolitan area of São Paulo (cf. ADORNO and LAMIN 2008). Secondly, the growth of Brazilian's security market is related to the predominant general fear of crime in urban areas (cf. CUBAS 2005; CUBERT 2008). Although social groups with different socioeconomic status are affected in various ways by the prevalence of multidimensional violence and crime problems (cf. PINHEIRO et al. 2003; CECCATO et al. 2007), the phenomenon of fear and feeling of insecurity has become a problem in society as a whole – an evolution seemingly constituted by the postmodern “metropolis of fear” (“fobópolis”) (cf. SOUZA 2008). Thirdly, the increasing importance of private security issues is characterized by a steady growth of mass private properties, involving the spread of semi-public spaces like shopping centers, entertainment centers, privately managed sport areas or even enclosed residential units with limited or regulated public access (cf. ZANETIC 2010).

The wide spectrum of financial and technical security measures requested from an expanding commercial security market by private households illustrates the tendency for security-oriented safety-seeking practice in Brazilian urban life to be increasingly widespread. Within the municipality of São Paulo it seems impossible to walk through different districts without facing innumerable installations of electrical security measures like video and surveillance cameras, electronic fences and gates or alarm systems. Following saturation in certain segments of the commercial security market, the electronic security one has been growing for several years. As mentioned above, the expected expansionary spread of electrical security measures will be manifested not only in upper class residential areas, but rather in the private space of the new middle class, which benefits from the growing affluence of one of the world's leading emerging markets. The on-going prevalence of new technical security issues can be analyzed both by studying academic papers or economic data, and by mapping installations which have already been implemented. However, observation does not address questions about the impact and consequences of this new quantity and dimension of security aspects in the everyday ordinary setting of urban life, which will be discussed below.

During a five-month stay in the city of São Paulo in 2011 to study these research questions, a mix of qualitative methods was applied. These included participant observation and guided or unstructured interviews both with stakeholders of public and private security concerns and with individuals. Different neighborhoods in the district Jabaquara (223,780 inhabitants; census data 2010), located in the south of the municipality of São Paulo, were selected as the case study areas based on the analysis of a first long-term research phase. This contained a wide area observation and preliminary discussions with social agents in ordinary settings, interviews with representatives of state and municipal public security institutions (Polícia Militar - PM, Polícia Civil - PC, Guarda Civil Met-

ropolitana - GCM), as well as attendance of various communal security councils (Conselho de Segurança Comunitaria). The neighborhoods Vila Mascote, Cidade Vargas, Vila Guarani and Vila Santa Catarina belong to the (broad Brazilian) middleclass residential area (2.3 - 7.6 minimum wages/household). The district's inner socioeconomic differentiation has a heterogeneous structure which corresponds to the spatial proximity of squatter settlements and high income housing units. The district emerged as a relatively homogeneous unit between 1940 and 1960 and is characterized by one- to three-floor detached and terraced houses as well as by low dynamic vertical transformation (so-called *condomínios*). In addition, the four middleclass neighborhoods are characterized by a massive expansion of personnel and technical security measures (alarm systems, video cameras, security guards, private security patrols).

To offer a preliminary analysis of types, meanings and consequences of omnipresent security practices in everyday life, six interviews (interviews 1-6<sup>2</sup>) have been chosen to exemplarily represent the studied group of the wide Brazilian middleclass. The interviews were conducted personally by the author in an open, consciously unstructured conversation addressing topics like the residential environment, neighborly interaction, daily routine, public and private security concerns and personal dealing with subjective feelings of (in)security.

All interviewees are married, employed or self-employed (retired only i6), 41-57 years old, have (in some cases grown-up) children and have been living for either between four and ten years (i1, i2, i5, i6) or for 30 to 49 years (i3, i4) in the district of Jabaquara. They occupy with their families (or only their partner) detached or terraced houses in the publicly accessible neighborhoods of Cidade Vargas (i1, i2, i6), Vila Guarani (i3); Vila Santa Catarina (i4) and Vila Mascote (i5). The fronts of their residences (with plots of 5-10 x 25m) are barricaded to varying degrees (newer automatic garage door, some high walls with additional barbed wire fences or grilles), and, in some cases, they possess different forms of electronic security measures like surveillance cameras at the entrance, alarm systems, or electronic fences. Interviewees' homes are equipped to middleclass consumer standards and the households are run by domestic workers who primarily come from surrounding squatter settlements.

The daily routine on weekdays or weekends and leisure time can be exemplarily described as follows: interviewee leaves home early (6.30-7.30am) (i1, i2, i4, i5), uses the car or the metro (sometimes in connection with a special pick-up service offered by a private security company, formerly demanded by i6) to get to the workplace (Jabaquara or outside the district). The working period varies between 7 and 12 hours. Everyone returns home between 6 and 7pm, and spends the rest of the day mainly inside the house (i1-i6).

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2 In the following the six interviews will be abbreviated with "i1" - "i6"

The description of daily evening activities includes sports (usually on the way back home from work) (i1), participation in club activities in the district (i3), meeting friends at their homes or in dining establishments (i2, i3, i5), visiting public parks in the surrounding neighborhood (i1, i2, i3, i4) and staying at home and spending time with the family (i1-i6). At weekends or during leisure time interviewees primarily spend time with their families (i1-i6) or friends and the extended family circle (i1, i2, i3, i5, i6). Depending on the children's ages, on the family's income and personal leisure preferences, they visit shopping centers and restaurants, entertainment centers or recreational facilities, meet or host their friends and families, make trips to the beach, go to church or just for a walk.

Safety aspects in everyday life were emphasized with varying importance in the description of routine daily activities. The narratives range from the account "to be able to move relatively safely in the quarter" in general (i5) to the statement, that "security and crime problems are related to the opportunity" that would be given to petty crime while cleaning the backyard (i2) and "already existed 30 years ago" (i3). Furthermore, descriptions of safety issues in daily life mention that there are "so many assaults in Brazil in absolute numbers that every child would have to face them" (i1) while accompanying his/her mother to the bakery, and include emphasis of the growing concern about "physical violence in the street" on the way to the metro station (i6), and the comment about the omnipresent "fear" of waiting outside the neighbor's front door as well as the observation that "fear-related activities are spreading" in the surrounding neighborhoods (i4).

Safety aspects and security issues are associated with the subjective feeling of being safe or considering the family and especially children as well-protected (i1-i6). This feeling is expressed in various ways and using different examples of interviewees' routine narratives. On the one hand, effecting household and car theft insurances is considered to be an ordinary procedure which is often related to burglary events in the narrow family circle or in the neighborhood (i1, i4). Providing security to one's property is also shown as being the principal motive for moving from an apartment with an open parking lot to a residential house which offers the ability to protect one's car against vandalism in its own secure and enclosed carport. On the other hand, visiting a shopping centre or going to the beach in Santos' area is related to the certainty of finding "places of relative safety", which are frequented by "civilized" people and where pocket picking at best is a failing related to one's own carelessness (i1). At the same time, there is mention of activity patterns like avoiding going to gastronomy establishments below one's own socioeconomic status, observing attentively various "less- or non-controllable sites" on a night walk and avoiding coming home too late after dinner, which are believed to prevent conflicts and render one safe (i2, i3, i5).

In addition, in the course of pursuing safety and attempting to protect oneself, the family and social environment from danger, the interviewees narrate numerous practices like

barricading the property fronts with high walls, gates and grilles (i1-i6), “the cautious opening of the front door” before leaving the residential area (i1), having a “guard dog at the entrance” (i3), favoring a “rapid drive-out through the automatic garage door” (i5), ordering the Saturday night pizza by phone (i4) and hiring a guard service in the street (i1, i2, i4, i5, i6). “One thinks of saving one’s own life.” (i1). Depending on the individuals’ assessment of danger, different avoidance behaviors are mentioned concerning several practices and measures applied to ensure safety. On the one hand, some interviewees avoid passing a location well-known to be used as a meeting place by drug users at night (i3), or avoid entering the home after a Saturday night party if a stranger comes up to the doorstep (i1). Furthermore one interviewee simply prefers to sleep in his parent’s house next door to protect himself and to be safe. Lingering at the neighbor’s front door having a chat (i6) or leaving the house at night to meet with friends in a bar nearby (i4), are considered daily activities to be avoided because of the fear of not being protected (anymore) against the danger.

A broad range of observable mechanisms were used by interviewees to protect themselves. Several forms of personal behavior, services and implemented measures can be distinguished, all related to the search for safety. Three forms of security measures and services are mentioned, implemented for the purpose of moving the residents or involving reconstruction procedures (i2, i6). These were applied after long deliberation processes (i3), but also as an immediate response to victimization events (i4, i5). Firstly, security guards may be employed to watch a stretch of the street; this employment is informal and guards are paid monthly by the neighbors (i2, i4, i5, i6). Secondly, different forms of services offered by local security companies are and were used by several households (i1, i3, i4, i6), these include the pick-up service, a 24-hour alarm system, nocturnal patrolling and monitoring of the client’s departures and arrivals by car. Thirdly, concerning the responsibility to protect oneself against personal and neighborhood related danger, physical security measures are mentioned (i1-i6). In addition to the area-wide expansion of fences, grilles and enclosed entrance gates (i1-i6), an increasing number of electronic security measures have been observed, both in the neighborhood and the families’ and friends’ surroundings. This includes not only the installation of electronic fences and automatic garage doors in the last 10-15 years (i3, i4), but also the more frequently used security cameras, either online-based or accessible via TV system (i1-i6). Three of six interviewees have already implemented camera systems (i1, i3, i6) and another two interviewed households are planning to install (i4, i5) them, with the purpose of surveillance of the driveway and identification of movements in the street. Related to personal involvement with robberies in the driveway (i1, i5), assaults at the front door (i3), house burglary and vandalism (i4, i6), and mugging in local shops (i1), the interviewees highlight the application of security camera systems as common and useful in making private space safe. The implementation of security cameras has being commented on in neighborhood associations (i6), is recommended by friends and family (i1, i6), and such equipment can

be purchased at the local stationery shop (i2). However, when talking about different types of safety-seeking practices, the interviewees' assessments and expectation of security measures differ significantly.

On the one hand, the application of camera systems are considered to be a additional option to increase personal safety because the technology renders it possible to make danger visible without having physical contact. However, concomitant with security cameras, the interviewees also emphasize other practices as mechanisms of self-protection, such as continuous interaction with representatives of public order and safety concerns (PM, PC, GCM), different types of conflict prevention and participation in community life (I1, i2, i3, i5). On the other hand, different kinds of physical installations like barbed wire fences and automatic garage doors are considered essential practices providing more safety (i4, i6). It was pointed out that the official security services' employees, the informally employed guards, and the public security agents do not accomplish their work effectively. Interviewees mention the continued occurrence of assaults and the fear of being exposed to danger at the front door, factors that call for supplementary options to increase personal safety. In this regard, the planned implementation (i4) or the – after its theft – reaffixing of (i6) a camera system in private space is considered to be a helpful as well as a necessary option.

#### 4 Conclusion

Within the broad setting of an amplified application and an increasing demand for technical security measures and services (electronic fences, electronic gates, security cameras, 24-hour alarm system, driveway monitoring) by middleclass households in the metropolitan area of São Paulo, this paper takes into account their impact on the individual production of security and safety. All kinds of safety aspects and security measures dwindle in importance in various everyday activities like driving to work, chatting with the neighbor, going out and shopping in the local bakery. Using the *Sicherheit*-concept of BAUMAN (1999), the broad range of observable mechanisms of self-protection can be typified as the three forms of *Sicherheit*: to give security to one's property through effecting insurance or deciding to move place of residence (*security*); to have the certainty of staying among "civilized" people or not being exposed to risks because of one's reasonable behavior (*certainty*); and to search for safety and avert risk from the family by engaging a street guard, barricading the property front or installing technical and (more recently) electronic security measures (*safety*).

Analyzing the third ingredient of *Sicherheit* draws the study's attention to different avoidance behaviors which depend on the individuals' assessments of danger. Some of interviewees' narrations mention the personal mechanism of pursuing self-protection by avoiding certain places and activities. Concerning the fear of not being protected (anymore)

against danger, other interviewed households emphasized avoiding staying in the street, standing in front of a neighbor's door, going out for dinner or meeting friends at night. According to BAUMAN, the absence or lack of one of the three ingredients of *Sicherheit* goes hand in hand with the loss of self-confidence and self-assurance in daily routine and routine behavior and leads to caginess, existential mistrust and unspecific fear. As a preliminary result, the selected interviewees can be divided into two groups. Some interviewees' narrations (i1, i2, i3, i5) demonstrate rather self-secure daily behavior in the daily context of crime and violence and mention self-protection mechanisms which can be assigned to all three forms of *Sicherheit*. Other households interviewed (i4, i6) emphasize an omnipresent fear in daily life that makes them and their families avoid everyday activities. Both groups point out the successive expansion and implementation of electronic security measures both in their social environment and their own houses. At the same time the description of the electronic security measures, especially the application of camera systems, differs in terms of the expectations as to whether they are an extra option to increase personal safety in addition to other self-protection mechanisms (i1, i3, i5), or whether they are a supplementary way of increasing personal *Sicherheit* (i4, i6) that cannot be produced or accomplished by other mechanisms of self-protection or agents of public order and safety.

BAUMAN (1999) developed his *Sicherheit*-concept to discuss the field of tension of security and freedom; two values the balance of which is considered to be a fundamental characteristic of modernism's history. Despite critiques regarding the blurry reflection of the current, neo-liberal pluralism of freedom and security (cf. KASTNER 2002), it is important to note the analytical content of the triad "security-certainty-safety" for the analysis of everyday security-oriented and safety-seeking practices as a conceptual extension – especially in relation to the spatial manifestation of more recent, electronic security measures with a simultaneous increase in citizens' feelings of insecurity.

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## **Sustainability through Social Capital in Collective Housing: The Case of Vecindades in Mexico D.F.**

Marina Montelongo Arana (Cologne), Simone Sandholz (Innsbruck) and  
Johannes Hamhaber (Cologne)

### **Abstract**

The current consumption patterns of modern lifestyles, especially in developed countries, are one of the key driving forces behind global unsustainable development. Unfortunately, no major government or transnational corporation has implemented consistent and sufficient policies and programs necessary for true sustainability. In such a context, the role of civic actors is increasing, particularly households as consumers and active members of society. Thus, alternative forms of housing may influence the domestic consumption and foster sustainable living.

From an interdisciplinary perspective, this article explores the potential of collective housing for sustainability. It empirically compares the sustainability patterns of collective housing and conventional homes, assuming that their differing spatial configurations will influence the formation of social capital and thus the consumptive patterns of the inhabitants. The study was carried out in *vecindades*: Mexican urban housing for low income people that is characterized by the houses arranged round a central courtyard and the sharing of services.

First, the paper identifies the potential sustainable practices in collective housing and then explores their potential social, economic and environmental benefits. The paper concludes by giving some general recommendations regarding the implementation of sustainable practices in *vecindades* and beyond. The results suggest that spaces created for socialization play a fundamental role in creating social capital and that social capital can provide favorable conditions for creating supportive environments that are able to influence the consumptive choices of the members of a given group or community.

### **1 Introduction**

Current consumption patterns, principally in developed countries, are one of the key driving forces behind today's unsustainable development. Their negative impact on the environment results from depletion of natural resources and direct and indirect impacts in energy and material demands for production, manufacturing, transport and disposal of

goods (MOLL et al. 2005, p. 261). Despite this, no major government, industry or transnational corporation has implemented consistent and sufficient policies and programs necessary for achieving sustainability. Thus, civic action concerning environmental issues is increasingly important. The potential of fostering sustainability at the point of final consumption, the households, may vary between different forms of housing. Especially collective housing carries promise for more sustainability assuming that the spatial layout may enhance the formation of social capital and thus the potential to implement of sustainable practices. While multiple sources and manifestations of social capital have been widely studied, researchers have underestimated the role of the spatial layout for the creation of social capital. This paper presumes that the spatial layout of collective housing plays a key role in facilitating a high rate of interaction among its residents. Under certain conditions, high frequency of contact may facilitate the formation of social capital. To test this presumption, qualitative research was conducted in four *vecindades* in Mexico City. A *vecindad* is a type of urban housing for low income people that is characterized by having houses arranged around a central courtyard and share of services.

In this study, socio-economic and environmental indicators were developed to empirically evaluate the potential for promoting sustainability in collective housing compared to single homes. Social indicators are aimed at assessing issues related with social relations; composite indicators are used for measuring the potential for less consumption, while environmental indicators are related to energy demand. Direct observations, questionnaires and interviews were used to identify spaces that promote and increase the frequency of interaction. Furthermore, these data were used to analyze how these spaces influence the creation and destruction of social capital. As household decisions are influenced by the surroundings of the people who make them, this paper assumes that a strong connection with the community – social capital – has the potential to modify patterns and levels of consumption through the implementation of sustainable practices. Sustainability is addressed from a social perspective: Housing is considered socially sustainable when it encourages the development and maintenance of social networks and various types of solidarity. At the end of this paper, the potential of collective housing to promote sustainability is explored by identifying the different sustainable practices to be implemented.

## **2 Collective housing, social capital and sustainability**

### **2.1 Collective housing and the construction of social capital**

Although the definitions, sources and forms of social capital have been widely discussed by many authors (BOURDIEU 1986; COLEMAN 1988; PUTNAM 1993) the role of spatial layout for the construction of social capital has not been extensively explored.

Past research has concluded that the spatial patterns created by buildings play a central role in social phenomena (PENN et al. 1999, p. 12.4; PENN et al. 1992, p. 43).

Spatial layout and patterns of land use affect the pattern movement and therefore the frequency of contact. While studying interaction in work environments, Penn found that the more integrated a part of a building is, the more interaction and communication of its residents have. Penn also found that, the more accessible spaces have a greater number of people both visible and directly reachable (PENN et al. 1999, pp. 12.4-15).

The layout of collective housing – by definition – has certain features that promote a constant interaction among its residents. Exploring communication in public space, face to face communication offers full sensory involvement, generating all kinds of feelings such as anger, fear or pleasure (DRUCKER 1991, p. 295). The frequent interaction of individuals does not guarantee the presence of social capital. The social dynamics of each case study will encourage or discourage the formation of social capital.

MELTZER places the most immediate antecedent to the current forms of communal housing in the communes of the 1960s and 70s, establishing a clear relationship between the definition of community, which originated from the Latin *communis*: com = “with” and *munus* = “duty”, and the basics of collective housing (MELTZER 2005, p. 2). Community becomes characterized by social interaction, shared ties and common geographical location (MELTZER 2005, p. 2). In terms of social capital, it is important to establish a differentiation between communities formed by necessity or intentionally. An intentional community is a group of people sharing values, goals or interests so the types and frequency of interaction can be more and more planned than spontaneous.

Currently there is confusion over what term actually denotes collective housing; collective housing is the most widely used term to describe distinct collective developments, from massive apartment blocks to cohousing (MAHER 2007, p. 3). In this study, collective housing is defined as “housing with more communal spaces or collectively organized facilities than conventional housing” (VESTBRO 2000, p. 165 quoted in MAHER 2007, p. 3). In general terms and referring to spatial layout, it is possible to find the presence of elements promoting social interaction in collective housing such as communal outside areas as a central courtyard, gardens or a pedestrian street linking houses on both sides. Past research identified axial lines as important elements promoting interaction because they represent busy routes (PENN 1997, p. 12.6). Other authors go further and indicate the sustainable character of collective housing pointing to a link between the main principles of functionalist architecture and the conception of collective housing. In this case, it is possible to observe the idea of rational living both in the layout of the flats and the use and distribution of services that were designed according to the functionalist idea of minimum requirements (VESTBRO 1992, p. 2).

With respect to spaces and activities that collectively encourage interaction, there are shared spaces in collective housing such as shared kitchens, laundry rooms, guest rooms,

recreations rooms, libraries, bathrooms, etc. (MELTZER 2005; MAHER 2007). Although the forms of ownership are very variable, more or less, in all cases of collective housing previously studied by MAHER (2007) there was an active and collective participation of local residents in decision making. The forms of ownership promote or even force interaction between neighbors.

Finally, it is important to highlight the issue with respect to privacy. Spaces are usually identified as public or private spaces. Home is usually related to the private space. Collective housing tends to diminish private space. However, private space is essential to promote and to maintain social capital. In 1966, EDWARD T. HALL refers to Calhoun's experiments with rats to highlight possible social and physiological effects of overcrowding in human beings. Calhoun invented the term "behavioral sink" to designate the gross distortions of behavior he observed in participating rats. The behavioral sink in rats included disruptions of nest building, courting, sex behavior, reproduction and social organization (HALL 1966, p. 26). Crowding disrupts important social functions and so leads to disorganization and ultimately to population collapse or large scale die-off (HALL 1966, p. 32). Also quoted in HALL (1966), Hediger identifies four different distances in man: Intimate, personal, social and public. To provide the necessary distance towards others in order to feel sociable, it would be necessary to consider the personal distance that designates the distance separating the members of non-contact species and the social distance defined as the limit of domination (HALL 1966, pp. 116-123).

## 2.2 Sustainable housing

The concept of sustainable housing incorporates different goals and approaches. There are interchangeable terms for referring to housing that is more environmentally friendly than average housing: Passive houses, green architecture, eco-villages, bio climatic architecture, ecological housing, autonomous houses, energy efficient housing, low-carbon housing and sustainable housing among others. These terms have been changing together with the different circumstances and necessities over time. Whereas in the past, most of the basic concepts from bioclimatic architecture were used by native peoples for the sole purpose of maximizing thermal comfort; due to the oil crises, i.e., the energy crises in the 1970s, the concept of energy efficiency in buildings was incorporated into bioclimatic architecture. Therefore, passive systems for producing and storing energy became very important. Nowadays, climate change and other environmental issues are drivers for sustainable housing. Issues such as construction supply chain, reducing ecological footprints or reducing the CO<sub>2</sub> emissions of buildings have been incorporated into the concept of sustainable building (SEYFANG 2009, pp. 1-2).

This paper subscribes to the sustainability framework agreed during the third European Ministers Conference on sustainable housing 2002 in Belgium, in which a strong focus

was put on social aspects to the sustainability of buildings in addition to construction and eco-efficiency issues. Furthermore, this paper addresses the sustainability of housing from a social perspective, without taking construction and eco-efficiency perspectives into account.

Socio-economic perspectives refer to the “viable” characteristics of accommodation for the occupier: a) affordability based on the actual financial means of the occupiers, so that they are able to support the direct costs of the accommodation without having to neglect other essential needs (balanced diet, health, education, culture, etc.); b) indirect costs such as commuting and other travel costs linked to the location of the housing; c) impacts of housing and more generally of the residential environment upon the physical and mental health of the occupiers; d) psychological and social function of the housing and the residential environment: moving from a “place to live” to a “home”, while encouraging the development and maintenance social networks and various types of social solidarity (MONNIER 2009).

### **2.3 The role of social capital for sustainability**

Besides economic capital, different authors have distinguished different types of capitals as symbolic, cultural, human, physical, natural and social capital. The term social capital was identified by Jane Jacobs in 1961 (PADOVAN 2006, p. 67) and then BOURDIEU (1986) placed it in a much broader context. In recent years, the interest around the concept of social capital has increased and has been interpreted by several authors and used in social, political and economic fields.

Social capital is defined in this paper as being “productive, making possible the achievement of certain ends that in its absence would not be possible” (COLEMAN 1988, p. 98). Trust, networks, solidarity, integrity and cooperation are concepts directly associated with the concept of social capital.

As stated earlier, different authors with different background have approached the term of social capital from very different ways over time. In most cases there is no consensus in closely related terms. What is defined as forms by COLEMAN, is defined as sources by PADOVAN (COLEMAN 1988, p. 101, PADOVAN 2006, p.67). This paper does not enter into this debate. Instead, it presents what these authors consider as the most representative definitions of forms of social capital without regard to a particular author.

**Obligations, expectations and trustworthiness of structures:** This form of social capital is based on the idea of reciprocal altruism. If A does something for B and trusts B to reciprocate in the future, this establishes an expectation in A and an obligation on the part of B. COLEMAN calls this obligation credit slips, which constitute a large body of

credit that A can call if necessary (COLEMAN 1988 p. 102). In cases where the members of a given group help each other constantly or they look out for each other's interest, reciprocity is strong and there is a large number of credit slips waiting to be used on both sides of a relationship.

**Participation in networks and groups (or information channels):** Individuals acting on their own are not generators of social capital; they have to participate in different forms of organizations and social networks for their actions to be considered social capital. Among the many different types of connections between groups are trading goods, common celebrations, provision of loans, mutual help or exchange of information (PADOVAN 2006 p. 68) Information channels are important in providing a basis for action; information is the engine for the action and good information is necessary to obtain the wanted and expected results. Acquisition of information is costly; it requires time, sources to obtain the good information and ability to process information. Social relations can be used to acquire information (COLEMAN 1988, p. 104).

**Norms and effective sanctions:** According to Coleman, norms that are effective can constitute a powerful form of social capital (COLEMAN 1988, p. 69). Social norms are the rules of the game; individuals can take responsibility and ensure their rights will be respected, thus providing a form of formal or informal social control. They reflect the degree to which individuals agree to mediate or control their own behavior (PADOVAN 2006, p. 69). Certain circumstances provide better conditions than others for the creation and implementation of rules. In 1988, Coleman underlined the importance of forgetting self-interest and acting in the interest of the collectivity as a fundamental norm (COLEMAN 1988, p. 104). He also argues that norms will be more effective if there is a closed system in which all members communicate with each other and where it is possible to provide a collective sanction. COLEMAN asserts warnings that while the strict application of effective norms facilitates certain actions, it constrains others.

**Relations of trust:** trust entails a willingness to take risk; the individual may respond in a mutually supportive way or not. If successful, trust enhances cooperation. In practical terms, it reduces the transaction costs between people. Instead of having to invest in monitoring others, individuals are able to trust them to act as expected (PADOVAN 2006, p. 69). Building trust takes time and trust is easily broken.

**Self-interest:** although the concept of self-interest appears to be in direct confrontation with social capital, it should be considered as a genuine form of social capital. If the members of a group share necessities, they will also share common goals and they will cooperate within the group in order to achieve the common interests which are in their self-interest at the same time (MONTELONGO 2011, p. 26).

**Motivational motives (emotional reasons), pro-social emotions and kin altruism:**

These three concepts have been identified as reasons why people decide to cooperate. However, they are not recognized as forms of social capital. Emotional reasons are the most difficult forms of social capital found outside the family, but also the most effective as they promote cooperation regardless of personal interest. This type of social capital is developed over time and based on shared experiences among the members of the community (MONTELONGO 2011, p. 27)

The presence of social capital influences in a very significant way the implementation of sustainable practices. Forms of social capital as relations of trust or motivational motives among the members of a given group or community can provide the necessary social support to enable individuals to act independently of external social forces. Such forces push individuals to act guided by what others say, do and buy and not by their personal choice. Previous research established “an inverse relationship between social capital and competitive relationships between community members” (PUTNAM 2008, quoted in FRISK 2007, p. 19).

This paper assumes that through community work it is possible to influence values and attitudes and thus choices so that needs may be imposed on wants and it is possible to move from emotional buying to rational buying. Current criticisms on the wide range of consumer behavior theories focus on recording that there are multiple aspects such as habits, routines, cues, personal capabilities and motivations among others that limit our ability to take deliberative action (JACKSON 2004, pp. vii, x). Recognizing the complexity of buying actions, this paper underlines the priority of radical change including ethical and moral values influencing current life styles – principally in developed countries – as a driver in changing patterns and levels of consumption. The positive impact from the presence of social capital can be transferred to the economic and environmental fields.

With respect to economic terms and from a theoretical point of view, transactions in the market are more efficient within a group with high levels of trust. PUTNAM (1993) stated that economic sociologist MARK GRANOVETTER “pointed out that economic transactions like contracting or job searches are more efficient when they are embedded in social networks” (quoted in PUTNAM 1993). When trustworthiness is ensured, then elaborate, time consuming and expensive insurance devices are not necessary (COLEMAN 1998, p. 99).

Concerning environmental terms, past research has highlighted the importance of collective civil action as a mechanism for environmental change. Results from WAKEFIELD suggest that factors related to social capital and environmental exposure play a stronger role in civic environmental action than socio-demographic factors (WAKEFIELD et al. 2006, p. 40).

## 2.4 Conceptual connections

Figure 1 shows the relation between the impact of spatial configuration of collective housing on the frequency of contact between its inhabitants and the consequent formation of social capital. As well, it also shows the potential influence the latter has in the decisions of the household in order to promote sustainable practices.

a) The spatial layout and common spaces in collective housing play key roles in facilitating a high rate of interaction among its residents. The spaces promoting interaction vary according the particular characteristics of housing; they can be common indoor and outdoor areas, a central courtyard or shared services such as laundry rooms or dining rooms.

b) A high frequency of contact among the residents of collective housing facilitates the formation of different forms of social capital. However, a high frequency of interaction does not automatically ensure the formation of social capital. Several aspects will influence the social dynamics of such groups or communities. In each case, the social dynamics will generate different forms of social capital or will destroy others.

c) Based on the fact that the decisions of the household may be influenced, a strong connection with the community (social capital) has the potential to modify patterns and levels of consumption creating optimal conditions for the implementation of friendly environmental behaviors (reuse/recycle practices, use of efficient light bulbs, etc), sharing of services (indoor-outdoor areas, laundry service, etc.) and sharing of goods (tools, food, etc.).

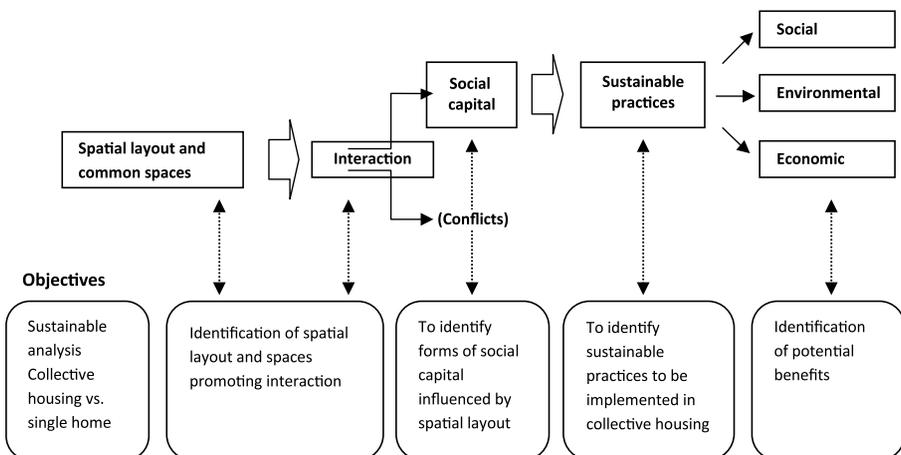


Figure 1: Conceptual connections

Source: Design by the authors

The implementation of such sustainable practices is a driver for positive impacts in social, economic and environmental terms on a sustainable development. Figure 1 shows the conceptual connections and objectives of this research.

### 3 Case studies and methods

Four *vecindades* in Mexico City were selected to conduct this research. The research used questionnaires, interviews and direct observation methodology. The outdated of the spatial design of *vecindad* in the current urban discourse and the well-known reluctance of their residents to deal with non-residents complicated the location of the node actors in research. In three cases, the contact with the nodes was established through civil and nongovernmental organizations that were advising and training in matters related to the improvement of housing. A personal contact was the node for the fourth case study.

#### 3.1 *Vecindades*

Officially, the term *vecindad* arose when reform laws were enacted during the second half of the nineteenth century. At that time, a large number of convents and churches were dismantled and expropriated, thus transforming by law large tracts of clerical land and building properties for other uses. The reason that the urban area between 1810 and 1876 did not grow despite the population growth was the re-functioning of these buildings. The buildings were subdivided and used as multifamily housing, even quadrupling density (CHANFÓN 1997, p. 142). However, the *vecindad*, as a housing typology designed with the clear intention to accommodate low income groups, was conceived as a consequence of population growth due to migration from rural areas to urban areas and the end of the revolution in 1910; the transition to modern times. The modern era was marked by the construction of infrastructure; the growth direction of the central city was determined by the topography and the railway lines. Numerous *vecindades* are built principally near the railroad tracks because that is where the immigrants arrive (Sandoval 2010 pers. comm).

In modern times, social inequalities have accentuated; while in some parts of the city people live at the levels of the best European cities, the poor are crowded. The *vecindad* has been associated from its origin as the place that hosts the poorest class of society. Poor construction materials and lack of infrastructure and services are common in *vecindades*. Of the five Mexican families observed by OSCAR LEWIS as part of his anthropological study in examining family dynamics, the poorest of them lived in a *vecindad* in Mexico City (LEWIS 1962). The combination of people who end up living in a *vecindad* depends on the location of the *vecindad*. *Vecindades* can house honest working people, as well some of the most troubled individuals of society. The currently prevailing collective perception in society is that the people living in *vecindades* have poor reputations. “If you

live in a *vecindad* it is because you don't have an education, because you are one of the worst" (Yolanda 2010, pers. comm.).

Despite that, there is nothing stipulating how a *vecindad* should be set up, they share the scheme of rooms arranged round a central courtyard. In all of them, it is possible to distinguish three main spaces: Private or enclosed space, semi-public space and public space. The enclosed space is where people perform the most private activities. In some cases, housing is only one round-room. A round room is a multiple services space that is used for cooking, sleeping and living. That means that private space is not very private; even if in the case where the room had an attic and was generously sized, there is hardly any kind of privacy for the members of the family (Sandoval G. 2010, pers. comm).

The semi-public space is represented by a central courtyard. The central courtyard is reminiscent of colonial style and is one of the oldest known communication systems in terms of spatial layout. The central courtyard encourages and enables a constant exchange and adaptation of a system of unwritten rules that all members must meet. This space represents the ability of inhabitants to live together (GADEA 2003, p. 12). The central courtyard is a semi-public space, meaning that someone outside the community cannot enter the courtyard. The border of this area is the gateway connecting the central courtyard with the street. Finally, the public space is the street. In the case of many *vecindades*, the public street is also a semi-public place because in this public space everyone knows each other, everyone is related to each other and everyone has a set of codes that are common for everybody (Sandoval, pers. comm).

The location and features of the surrounding environment have an influence on area per square meter, quality of construction materials, type and quality of spaces, lack of services and group dynamics.

The urban areas of the case studies are very different one from another. The *vecindad* Pedro Anaya 190 is located in the north of Mexico City, connecting the metropolitan area with the outskirts. The borough has a strong pre-Hispanic history and the "La Villa" Mecca of Catholicism in America is located there. As a consequence of the population growth, a large number of popular settlements moved into the territory. One of the largest industrial zones of the city shares the territory with chapels, prisons and popular neighborhoods. Not surprisingly assault, murder and domestic violence are common in the area. While conducting this study in the field, numerous *vecindades* were identified in this area. The vast majority of them do not have a central courtyard but rather a corridor that divides the houses on one side of another.

The urban area around the second case study, Trípoli 910, is very different. This *vecindad* is located in the central-south part of Mexico City and it is well connected to one

of the main financial centers of the whole country. This neighborhood has its origins in pre-Hispanic colonial time; it was trapped in the zone after the urban growth. This area is one of the favorite places for the alternative scene of the middle class to live. They are attracted to its bohemian atmosphere, bars and green areas. The area is a mixed use zone, being predominantly residential and commercial; the vast majority of businesses are related to the sale of materials for construction finishes. During the fieldwork was observed that although many *vecindades* have been replaced by private houses, is still easy to find them in the zone.

The last two case studies are located in the barrio Tepito, which is perhaps the most emblematic barrio of Mexico City. Being an Indian neighborhood originally, Tepito did not receive any financial support from the state. In addition to the indigenous population, this area was settled by immigrants who mostly came from a state famous for manufacturing shoes. Due to the superior craftsmanship of its inhabitants, in spite of the original bad relationship with the state, the inhabitants were able to revive the historic commercial character of the area, in which the largest market in America in pre-Hispanic times was located (Sandoval, pers. Comm.). Over time, products may have been adapted to market needs. Currently, the zone is a Mecca of informal trade.

Vecindades were very numerous and were a fundamental key to developing a way of life characterized by the abundance of social capital among the neighbors of the central town of Mexico City. After the earthquake on September 1985, the number of *vecindades* in the central town decreased dramatically. Currently, *vecindades* located in the historic centre are protected by the law of Historical Monuments.

### **3.2 Methods**

Direct observation and literature review were used to identify spatial layouts and spaces promoting interaction. The same methods were used to identify the potential sustainable practices to be implemented in collective housing and their potential social, economic and environmental benefits. The social complexity of the spaces promoting interaction was addressed by interviews. Semi-structured interviews allowed us to identify the influence of spatial layout and spaces uses for the construction and destruction of social capital. A questionnaire was applied to empirically evaluate the potential for sustainability in collective housing compared with single homes.

Each case study provided a neighbor guide for the field research. Sometimes the visit included arranged meals and spontaneous talks with the neighbors. During visits it was possible to verify the role of shared spaces and spatial layout in the promotion of social capital.

In order to understand the social complexity intrinsic to *vecindades*, a total of 14 semi-structured interviews were conducted. The interviews were classified into three grades of complexity: They were conducted with the most competent authorities on the issue, with the node contacts for each case study or with residents of *vecindades* in general. Data analysis was done using grounded theory, a mixture of inductive and deductive approaches. Grounded theory implies the discovery of a hypothesis and content analysis, which is concerned with testing hypotheses (RUSSELL 2006, pp. 492-514). Participants were asked to indicate advantages and disadvantages of living in a *vecindad*. From transcription and analysis of the information, three major topics emerged; one of which is shared spaces and spaces. Based on analysis of data from different case studies, the influence of spatial layout in the construction and destruction of social capital were identified.

Concerning the questionnaires, four case studies of *vecindades* were compared with three case studies of conventional housing (a gated community, a family housing unit and an apartment building). Data collection was focused on evaluating the connection to community, assuming that the more social support there was, the stronger the potential for implementing sustainable practices. The questions included social, economic and environmental indicators. Besides demographic aspects, data collection related to social indicators focused on those issues related to the frequency of interaction among neighbors, participation in social networks, level of customization and community participation. Two survey questions were adapted from a previous study by STACEY FRISK (2007), who evaluated the potential of cohousing as a sustainable housing solution. Two more questions were adapted from the Social Capital Community Benchmark Survey, developed at Harvard University's Saguaro Seminar (Saguaro Seminar 2000).

The questions asked were:

- How often do you talk to or visit your 5 immediate neighbors for more than 10 minutes?
- Are you a member of any group or organization?
- Enter the name of all the neighbors that you remember (maximum 15).
- During the last year, how often have you taken time to participate in activities with your neighbors?

One social, environmental and economic composite indicator was taken directly from STACEY FRISK (2007) to denote support for sharing consumption, assuming that social capital facilitate share of goods and services driving for more sustainable consumption:

- How often do you borrow or lend households items (e.g. tools, cooking items, ladder, etc.) from/to a neighbor?

Finally, environmental indicators were selected that focused on household characteristics related to energy consumption. Living space has a correlation with materials needed for construction, electricity use and consumption of household goods in general. Questions

were posed not only to compare the number of habitants/m<sup>2</sup> between collective housing and conventional housing, but also to evaluate the potential to reduce the living area in both cases, considering that energy costs are closely correlated to the living area. The rest of the questions were related to use and ownership of appliances and transport. Questions were adapted or taken directly from STACEY FRISK (2007).

- The square footage of your home is (excluding external areas) and the number of inhabitants?
- Given the number of people and activities in your home, this house feels (size)?
- Indicate what activities you can do and enter if you own one of these devices: Watch cable TV–refrigerator–computer with internet–washing machine.
- Ownership of car, van or truck, do you share it with someone else?

A total of 28 questionnaires were successfully completed in four *vecindades* and 14 usable questionnaires were returned from three conventional housing complexes. With the exception of one case study, all the questionnaires in *vecindades* were self-administrated. The information flow obtained through intermediate organization was poor and slow compared with self-administrated information. The apparent reason for that was the workload for the representative of the organization. Concerning the respondents, females are over represented in all cases because they were the only ones who were at home at the time the questionnaires were conducted. Concerning the data analysis, all variables were qualitative and bar graphs were used in order to visualize the distribution of the nominal and ordinal variables.

In the case of conventional homes, the data collection was very scarce due to the unwillingness of the residents to participate. In the case of *vecindades*, the data collection was slow because completing a questionnaire was a very unusual activity.

## 4 Results

### 4.1 Sustainable analysis of *vecindades* vs. single homes

Social, environmental and economic sustainability indicators were developed to empirically evaluate the potential for sustainability in collective housing compared with single homes.

Social sustainability indicators: These indicators were used to measure the frequency of interaction among neighbors. Over 57% of the respondents of conventional housing reported **talking or visiting with their neighbors** more than 10 minutes with a frequency of more than once per month. While conventional neighbors showed a surprising level of socialization, respondents of *vecindades* interacted significantly more with their neigh-

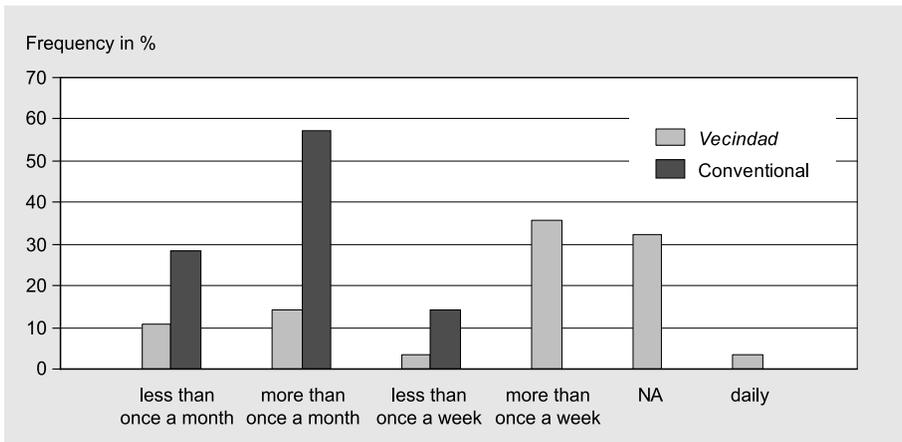


Figure 2: Frequency of interaction (talking with neighbors for more than ten minutes)

Source: Own survey

bors, with nearly 68% talking or visiting with a frequency of more than once a week or daily (Figure 2).

In order to assess **the level of customization** with neighbors, respondents were asked to name their neighbors by giving a maximum of 15 names. In this case it is difficult to evaluate the answers because it is not possible to know if the names given are from different neighbors or members of a single family. However it is interesting to note that in the case of conventional homes, only 14% were able to write down the last name of their neighbors compared to about 43% in the case of respondents from *vecindades*.

In terms of **activities with their community**, nearly 80% of conventional residents and 61% of residents of *vecindades* took time to participate in such activities 1-2 times per year. However, *vecindad* residents spent more time participating in group activities more frequently: 14% of *vecindad* residents participated more than once per month in activities with the neighbors, as compared to 7% of conventional housing residents. To determine the **degree of familiarity with social networks**, respondents were asked whether they were members of any group or organization. As for conventional housing residents, over 70% said they do not belong to any group or organization compared with 64% of *vecindad* residents who belonged to some organization.

The results deserve the following observations: In the case of frequency and duration of talks and visits among neighbors, conventional housing residents generally have a relatively high degree of confidence with an average of one or two neighbors. However, relationships with the rest of the neighbors are very distant. In the case of *vecindades*, re-

sidents have a particularly close relationship with no more than three neighbors; however, their relationship with the rest of neighbors is quite good.

In the case of community participation, in conventional homes, group activities are concentrated around the solution of problems related to maintenance and security while in the case of *vecindades* the problems are more frequent and more diversified, so that more community participation is required. In many cases, residents are directly involved with labor for the solution of problems.

Finally, the reason why the rate of participation in social networks and/or organizations of conventional housing residents is very low can be explained by a combination of lack of interest and lack of time. On the other hand, the high rate of participation of *vecindad* residents, principally in religious and housing organizations, is not surprising, given the fact that only acting as a group can their basic demands be attended.

Composite social, environmental and economic indicators: composite indicators showed a greater *vecindad* **support for sharing consumption**. While more than 64% of conventional participants borrowed or lent household items to their neighbors 1-2 times per year, just 35% of *vecindades* residents borrowed or lent items in that low frequency. Over 46% of *vecindad* residents borrowed or lent household items to their neighbors more than once a month and more than once a week, compared with 21% of conventional residents (Figure 3).

The sizes of the homes in the *vecindades* were quite variable, with the exception of the houses in the case study Gorostiza 36, *vecindades* were on average three times smaller

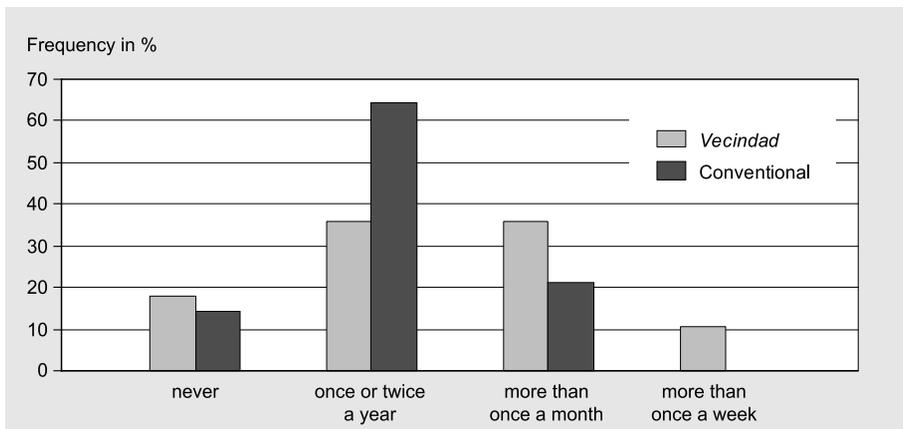


Figure 3: Frequency of lending s.th. to or borrowing s.th. from neighbors  
Source: Own survey

as compared to conventional homes. Over 75% of residents in *vecindades* felt that their homes were small or too small given the number of people living there. Over 71% of conventional residents felt the size of their homes was just right; the average square meter per capita in conventional housing was 35m<sup>2</sup>.

One of the main reasons for a high frequency in the exchange of things and subsequent support for sharing consumption is the existence of the central courtyard. A central courtyard guarantees permanent contact between the inhabitants and potentiates the opportunities for residents to lend and borrow items.

Undoubtedly, the lack of resources is another reason to share items. With respect to the size of the homes, except for the case study Gorostiza 36, all of the *vecindades* were very small and it is not feasible to think of a reduction of m<sup>2</sup> of construction per capita for saving energy resources.

Environmental sustainability indicators: Whether household operation was a substantial environmental burden, was determined by asking the type and the possession of appliances. In both cases, the ownership **rates of common household goods** were 0.0%. No one shares any appliances.

However, *vecindades* residents reported lower numbers of **possession of appliances**. In the case of televisions, it is not possible to know whether *vecindad* residents actually have fewer TVs, as they may have television but not cable; in the case of computers the number is much lower in *vecindades* than in conventional houses. In the case of washing machines, a significantly lower number was also observed in *vecindad* residents (cf. Table 1),

Another indicator used to denote environmental burden was **car ownership**. Table 2 shows car ownership by conventional and *vecindad* residents. *Vecindades* dramatically reduce the environmental burden of personal transport.

The 0.0% rate related to common household appliances can be explained because in the case of conventional homes, there is a natural tendency towards individuality. In addition, the potential benefits of sharing goods have not been experienced (e.g., the potential economic benefits of shared freezer services). On the other hand, in the case of *vecindades*, sometimes families are so numerous that it is not possible to share the resource with another family. Finally, the constant violations of existing regulations and abuse of some members prevent the application of these alternatives. In the case of the possession of devices, besides that the number is lower in *vecindades*, the use of the devices is maximized when it meets the demand for more people.

Table 1: Appliances

Appliance	Vecindades	Conventional
TV cable	46.42%	100%
Refrigerator	89.28%	100%
Computer with net	25%	71.42%

Source: Own survey

Table 2: Car ownership

Auto	Vecindades	Conventional
Yes	17.9%	92.85%

Source: Own survey

The low rate of laundry machines in *vecindades* can be explained by the fact that not only are washing machines expensive commodities, but also the practice of hand washing their laundry very widespread among neighborhood residents. The most apparent reason for the low rate of car ownership in *vecindades* is the lack of financial resources.

In social terms, the interactions among the *vecindad* residents were longer and more frequent than among conventional home residents. *Vecindad* residents have a higher participation in the community than conventional housing residents and their level of customization was also higher. These results indicate a higher level of social capital in collective housing.

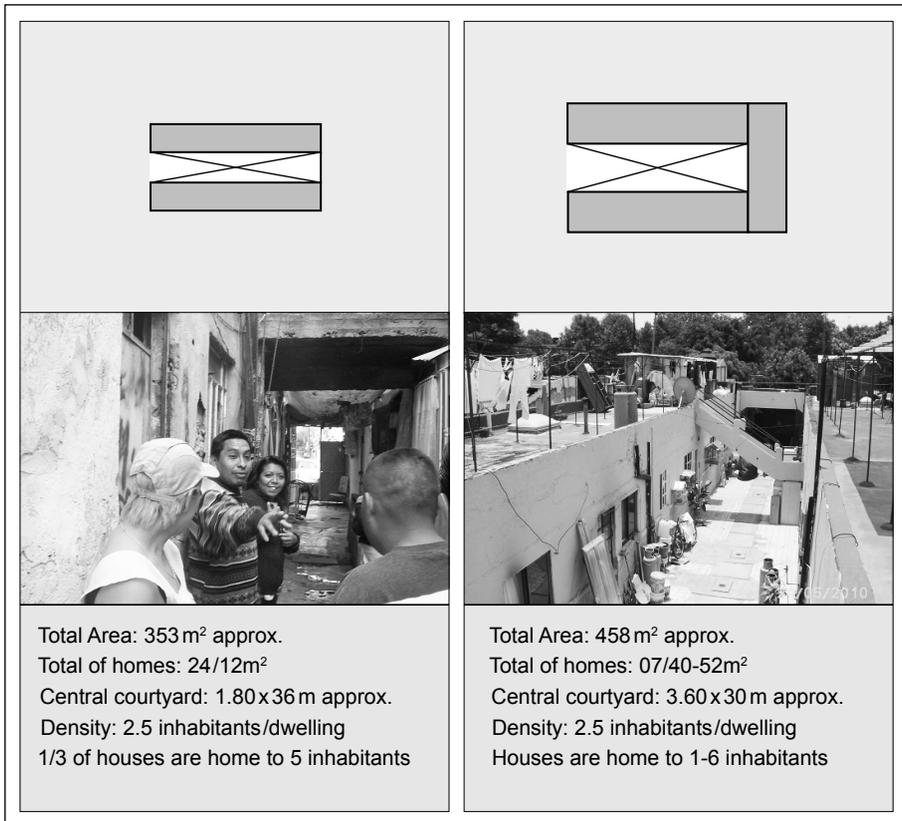
On the other hand, composite indicators showed a greater *vecindad* support for sharing consumption, confirming the assumption that the more social support, the stronger the potential for implementing sustainable practices. The fact that the sizes of the homes in *vecindades* were on average three times smaller as compared to conventional homes implies a direct reduction in energy consumption related with living space (materials needed for construction) and daily operation of home (electricity use and consumption of household goods in general).

Finally, *vecindad* residents reported lower numbers of possession of appliances and car ownership, which means less energy consumption among residents of *vecindad*. From the above results, it is easier to conclude that collective housing is more sustainable than conventional homes.

## 4.2 Spaces of collective housing influencing forms of social capital

The four case studies complied with the spatial social layout of housing arranged round a central courtyard (cf. Figure 4-7). Main differences were found in the size of the central courtyard and the size and type of interior spaces. On the other hand, in the cases of the gated community and family housing unit, houses are arranged round a central street with a single entry open to vehicles.

In the four *vecindad* cases, the central courtyard - the semi-public space accessible only to residents - was found to be the most important space for promoting interactions between occupants. In the *vecindades* Pedro Anaya 190 and Tripoli 910, the residents share the laundry area (hand wash) located in the central courtyard. In the *vecindad* Labradores 23, residents changed the community services (hand laundry area and toilets) to private



Figures 4 and 5: Pedro Anaya 190 (left), Vecindad Tripoli 910 (right)

Source: Own survey, photo of Figure 4 by Union Popular Carrera en Lucha A.C., photo of Figure 5 by the authors

services. In *vecindad* Trípoli 910, the laundry area, i.e., the area where the clothes are washed by hand and the area where the clothes are hung up to dry, is currently shared. In *vecindad* Gorostiza 36, neighbors never shared common services; in this *vecindad*, besides the central courtyard, each house has an internal central courtyard. In two cases of conventional homes, although they have a central space, the presence of vehicles prevents social interaction. This is proved by the fact that the meetings are held on the side where the street is closed, allowing them time to reach safety. The lift, the staircase and parking are the places that allow a quick greeting in the case of the apartment building.

Concerning private space, in the case of the smaller *vecindad*, the private space was round-use, meaning that all members of the family share a unique multi-functional space. In the other cases, homes have separate spaces for cooking and toilets. In the case of Trípoli 910, there is also a bedroom addition and multiple use room addition. In the other cases there are at least two bedroom additions.

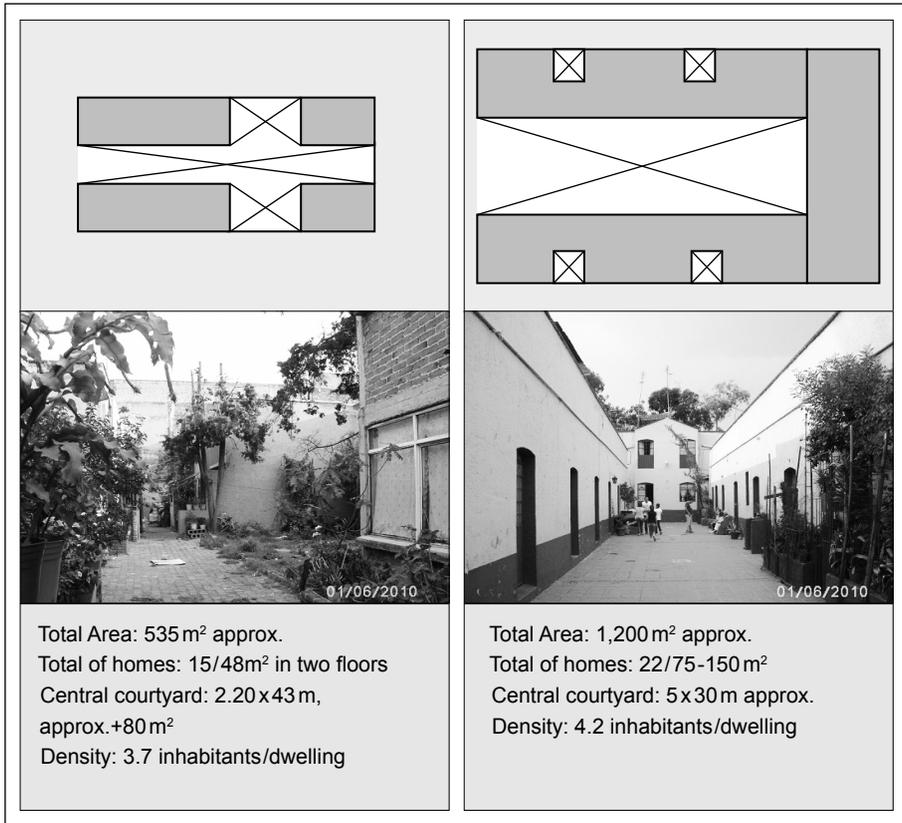
### **Promotion of social capital**

The central courtyard plays a fundamental role for the promotion of social capital. The central courtyard can be called the social space. Participation in networks and groups (information channels) is the most obvious form of social capital promoted by the central courtyard. The central courtyard is a very effective communication system among residents. It promotes all kind of interactions: Short but frequent interaction through informal greetings, long and direct interaction through meetings and indirect but continuous interaction through windows and doors facing the central courtyard.

The central courtyard is undoubtedly the best place to be well informed about issues related to the community (from engaging in personal gossip, to organizing for a political demonstration, avoiding evictions, obtaining legal advice, etc.).

In addition, constant interaction facilitates the sharing of goods, services and food. On the other hand, the central courtyard forces the ability to develop and enforce **norms and effective sanctions**. As a coexistence space, there should be development processes of adaptation and compliance to a series of unwritten rules in this place in order to keep the right to be a member of a given group or community. During a celebration, the individual has to behave properly towards other members. This form of social capital is also manifested in the task around the maintenance of the central courtyard and housekeeping. Being a shared space by several families, the central courtyard promotes one of the most difficult forms of social capital to find outside the family: **relations of trust, motivational motives and pro-social emotions**.

Having a central courtyard means mutual surveillance of property and young children (the central courtyard is also the children's playground). The constant interaction among



Figures 6 and 7: *Vecindad Labradores 23* (left), *Vecindad Gorostiza 36* (right)

Source: Own survey, photos by the authors

the children can help them develop one of the most effective forms of social capital: **Motivational motives**. The last three forms of social capital are also developed among the adults through multiple daily activities carried out in the central courtyard (celebrations, care for the neighbor's dog and plants, etc.). The central courtyard also promotes the form of capital called **self-interest**: If the residents decide to participate in information exchange and comply with the established norms, it is because they are interested in benefiting from the contribution of other members. Self-interest is closely related to a form of social capital called **obligations and expectations**, based on the idea of reciprocal altruism.

The other shared spaces more or less promote the different forms of social capital explained above. The laundry area - washing and drying - promotes forms of social capital as information channels (people meet and talk while washing and tending clothes) and norms and effective sanctions (leaving wet clothes in the drying area too long or stealing

the neighbor's clothes can cause conflicts). On the other side, shared common services of hand wash and toilets force the development of norms and effective sanctions (neighbors have to find an effective system of cleaning and maintenance).

### **Erosion of social capital**

The same spaces that promote social capital can destroy it. If the residents do not comply with the rules, the central courtyard will become a space for social conflict. Conflict can be inherited through generations. Practical problems in *vecindades* were related to disorder and lack of maintenance. As the only available free area, residents tend to use it as a storage area. On the other hand, they tend to agree that other neighbors break the established rules in order not to have to fight them and to be in the position to break other rules themselves: They allow the neighbor to have a pet in order to be allowed to have plants. In the long run, this situation can cause widespread discontent.

The same is true for the other common spaces and services. In practical terms, residents manifested multiple unconformities towards shared services: They were not sufficient; there were people who tried to appropriate the services for their own benefit; there were people who tried to monopolize the laundry tubs, there were people who listened to music that was too loud and the women were spied upon in the bathrooms.

The sizes of both private and semi-public space (central courtyard) affect the group dynamics. The highest level of cohesion among neighbors was observed in the *vecindad* with more space and less density per square meter while the *vecindad* with less private and semi-public space was the most contentious. However, even in the case of Labradores 23, where the spaces are bigger than in Tripoli 910, greater cohesion was found in the latter community. This means that although there is a direct relationship between the type and size of spaces with forms of social capital, there are other variables influencing the formation of social capital. Such variables determine the forms and levels of social capital and are closely related to group dynamics.

The situation was quite variable concerning to private space. The size of the homes oscillates between 12m<sup>2</sup> and 150 m<sup>2</sup>; the same space can homes between 1 and 6 inhabitants. However, in the *vecindad* with the homes of 12m<sup>2</sup>, a high degree of social decomposition was observed. The collected testimonies speak of violations to children, fights and massive presence of drugs in *vecindades* with similar spatial layout.

### **4.3 The potential of collective housing for promoting sustainability**

Sharing services (washing laundry by hand and toilets) is a sustainable practice. On one hand, it takes less construction material to build a common laundry washing area than to build laundry rooms for each family. Due to the fact that others are waiting to use the ser-

vices, one is forced to use the service quickly and efficiently. However, any sustainable practices that are now being carried out were implemented consciously. Some neighbors have already turned common services into private services and other neighbors are awaiting the opportunity to do the same. This indicates that actions aimed at low consumption were inherent to poverty and lack of resources. However, the potential of collective housing for sustainability is very high.

Some residents of *vecindades* had a very strong feeling of being excluded from society by the mere fact of living in a *vecindad*. This fact provides favorable conditions to create a supportive environment able to influence choices so that needs may be imposed on wants and allows moving from emotional buying to rational buying. In this way individuals could decide themselves about going against a destiny that is already written. Given the current low purchasing power of these groups, the major impact of sustainable practices would not be on the level of consumption, but in patterns of consumption. On the other hand, the productive potential of social capital can address the implementation of sustainable practices as comprehensive practical support for sustainable development.

Some sustainable practices may be taken individually; such is the case of friendly environmental behaviors as the use of efficient light bulbs, minimizing water consumption, etc. However, there are also sustainable practices based on an inherent dependence on a community as car pooling, sharing of property or sharing of goods and services. The implementation of both variants would promote a fully sustainable community.

Sustainable practices can be classified in three major groups:

- Environmentally friendly behaviors, such as using efficient light bulbs, minimizing water consumption, using dry bathrooms, collection and storage of water, implementing a system of water treatment, using cloth bags instead of plastic bags for daily purchases, turning off lights, reusing/recycling practices (paper, furniture, clothes, waste), using solar panels to minimize the use of fossil fuels, increasing green areas to recharge groundwater, consuming and if possible growing organic food, etc.
- Sharing of services such as common kitchens, communal refrigerators and/or freezers, car pooling, child care, catering services, bathrooms, laundry rooms, guest rooms, indoor and outdoor areas.
- Sharing of goods such as tools, food, clean products, entertainment games and furniture for parties and events, etc.

Figure 8 shows how the sequence of events for reduction in consumption towards sustainability could operate. Every social action will have an immediate economic and environmental impact. For example, in a community where it is not necessary to display an economic status, unnecessary purchases will be reduced leading to less individual acquisition. Less consumption will have direct and indirect impacts in the energy used for

production, assembly, transportation and disposal, which will lead to environmental and economic sustainability. Less consumption will have also a direct impact in the savings of residents.

It is understood that all sustainable practices will be counterproductive if the economic surplus gained is used to perform an action even more damaging in environmental terms than the actions performed before. In this context, it is important to highlight the fundamental role of a shift in values and moral consideration as part of the implementation for any sustainable development project. A critical issue is also being able to identify the specific potentials of each community. Not all sustainable practices can be implemented successfully everywhere. Sustainable practices should take into account the specific forms of social capital present in every case: Sharing of goods requires a higher level of trust than recycling products. Sustainable practices must also consider socio-demographic characteristics and vulnerability of the members of the group or community as well the beneficial impact of each practice: In places with high presence of social capital, it is feasible to implement more common practices; in a sunny place maybe it would be better to start installing solar panels than to implement a recycling program and so on. The impact of the implementation of sustainable practices should be evaluated very carefully. In the case of *vecindades*, the fact that only a few residents have a car is a good opportunity

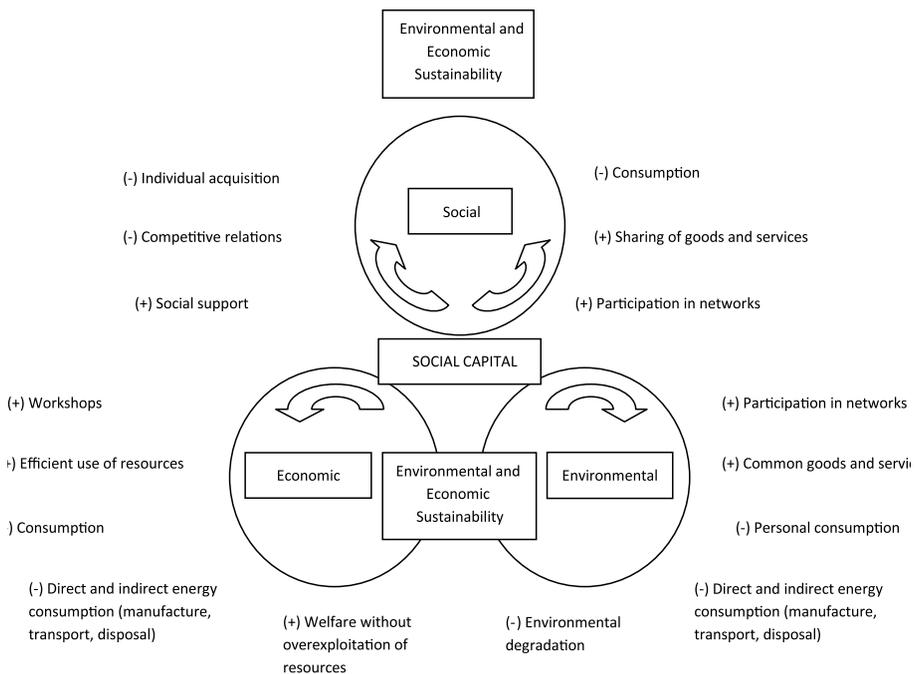


Figure 8: Sustainability cycle  
 Source: Design by the authors

to implement car pooling practice. However, if residents perceive the use of the car as very beneficial, there is a risk that people who currently use public transport would be tempted to purchase a private car. Finally, in the case of vulnerable groups as *vecindad* residents, linking social capital with government authorities and the capacity of action in the community plays a very important role in obtaining the necessary financial and political support to carry out any project.

## 5 Conclusions and recommendations

### Common areas and spaces

Collective housing should be not only a worthwhile living alternative for low income people, but should also be an attractive living alternative for the middle classes. It is essential to consider spaces for house common services in the initial design. The central courtyard promotes so many forms of social capital that it can be called the social space. However, it is necessary to establish rules and mechanisms to enforce the rules in order to avoid conflicts among the neighbors. The central courtyard must be reserved for pedestrians. As for the internal spaces, it is imperative that each member of the community has access to private space and distance from the group if required. For the efficient control and management of common goods, it is advisable to concentrate in one central space in which all items and facilities that a neighbor might need, e.g. tools, certain cooking ingredients or blankets. To avoid the “tragedy of the commons”, it is necessary to set clear and strict rules for the management, care and recovery of assets and resources. In the case of shared services, it is advisable to set fees according the frequency of use (e.g. fees for the use of washing machine). As for the common freezing service, it is desirable to provide a minimum of exclusive and secured space for each family. Detailed operating rules must be set according the specific priorities and customs of the members of the group; this implies the existence of several sustainable models.

### Sustainable practices

The fact that marginal groups experience being excluded from society provides favorable conditions for creating supportive environments that can have positive influence upon levels and patterns of consumption. Furthermore, these groups have great potentials for inter-group cooperation because they share common necessities and interest. In low income groups, the emphasis is more in changing patterns of consumption than in levels of consumption. However, the impact in the daily life must be much more significant: That they will have much more by having less.

Before implementing any sustainable practice, a comprehensive project for the community should be considered. Without a comprehensive plan, sustainable practices means

promoting the consumption of green inputs without any real benefit except for the seller of the “green” inputs. Group dynamics and forms of social capital are key components to decide what sustainable practices should be implemented in communities. Furthermore, each sustainable practice requires specific conditions for operation. The active component of social capital must be used towards sustainable development and not to increase consumption. This is because it is fundamental to include the discussion around a change of moral values, ethic, behavior and attitudes.

One of the main prerequisites to implement the largest possible number of sustainable practices in a given community is to attract new generations not to adopt sustainable practices as an isolated practice but as a way of life. Figure 9 shows a summary of the major results.

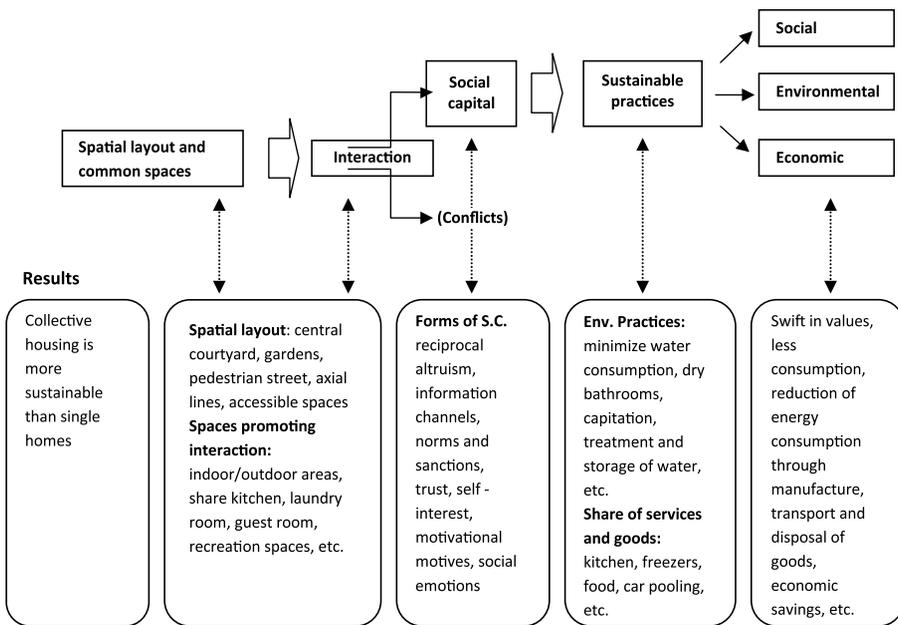


Figure 9: Main results

Source: Design by the authors

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## **Social Environmental Conflicts and Urban Lifestyles – New Patterns of Spatial Segregation in Santiago de Chile**

Ximena Galleguillos (Universidad Alberto Hurtado, Santiago de Chile)

### **Abstract**

For decades, spatial segregation in Santiago de Chile was characterized as a result of socio-economic stratification together with the growing gap between the rich and poor populations in Chile. Nevertheless, in recent years this “classic” pattern of spatial segregation has changed scale in Santiago. Housing investment in homogeneous poor sectors of the city has generated geographical proximity between residents of different socio-economic stratifications. Consequently, interaction between different neighbouring groups has developed from this changing pattern of residential location. The open socio-environmental conflict and direct confrontation, the apparent social integration and recently, a community practice of closure of passages and streets – where this last form leads to a new changing urban pattern from spatial segregation to territorial confinement – is a product of geographical proximity.

This research paper presents the methodological framework and characterizes three case studies as part of an ongoing investigation: three housing developments in the communes of Peñalolén, Huechuraba and Colina and their respective environments. Consequently, they are examples of colonization of peripheral contexts of urban poverty by gated communities. The central hypothesis guiding the research is that this “fence pattern” of territorial confinement is the expression of a new pattern of spatial segregation in Santiago de Chile. This fact is associated with a sense of communitarian insecurity constructed and anchored in representations of class, gender and ethnicity.

### **1 Introduction**

Spatial segregation is a paradigm of the development of cities, in the context of Latin America as a whole. Its impact on the quality of urban life is closely related to the valuation of social diversity in public space. Consequently, this purpose justifies investigation at the societal level to clarify phenomena and processes that keep coexisting inhabitants of cities in diversity, dignity, tolerance and equal rights; fundamental conditions for improving the quality of life in cities (GALLEGUILLOS 2007a). The new phenomenon of closure of passages and streets by communities has appeared in the last decade (2000) and does not correlate with local observed risk, either in the neighborhoods in question or in the Chilean cities in general (CIPER 2010; SABATINI et al. 2000).

For a deeper understanding of these phenomena, the methodological framework includes a characterization of three housing developments: Peñalolén (Parque Violeta Cousiño), Huechuraba (El Carmen) and Colina (Piedra Roja) and their respective environments. Examples of colonization of peripheral contexts of urban poverty by gated communities, these housing developments for the middle and upper classes show three types of spatial confinement. In the first case the perimeter fence surrounding an inner community is a response by the wider community. In the second case the perimeter fence is part of the building project. The third case consists of a complex consisting of several gated communities. The methodological approach applied in this study comes from Grounded Theory (GLASER and STRAUSS 1967; STRAUSS 1970).

The central question guiding the research is whether this “fence pattern” of territorial confinement represents a new pattern of spatial segregation in Santiago de Chile. This question is associated with a sense of communitarian insecurity constructed and anchored in representations of class, gender and ethnicity.

The persistent poverty and spatial segregation to which many of suburban residents of major Latin American cities are exposed, the discrimination in the provision of urban infrastructure and private incentives and the harsh conditions of city life, have highlighted the necessity to reflect upon the social impact of urban development. Consequently with these issues, in a context of increasing uncertainty (BAUMAN 2003, 2011), the role of community systems in the production of spatial confinement in Santiago de Chile becomes a central point. The main product is the theoretical and methodological contribution in the field of social production of space from the Chilean accumulated experience to the international knowledge towards the main goal of improvement quality life and integration on the poorest population to urban life.

## **2 Theoretical approach**

### **2.1 Fence pattern of public space or territorial confinement**

The pattern of closure of public space coincides with BAUMAN’S definition of territorial confinement (2003, 2011). It also has two logics of construction, the first being external territorial confinement by the construction of walls to contain poor communities (due to pressure from the surrounding community). This involves building market forces and the political powers that support them, the media and the sense of insecurity associated with victimization (BAUMAN 2003, 2011). Television and the media contribute greatly to strengthening and perpetuating socio-spatial segregation by feeding into a sense of perceived danger and insecurity regarding “outsiders”, thus motivating territorial confinement of our cities (BAUMAN 2003, 2011).

On the other hand, the auto confinement construction comes from within. The community (lower, middle and upper classes) perceives a risk of invasion from outsiders. Closed communities are separated from the rest of the city by protective walls, fences and a compact monitoring system to control entrances and exits. This causes residents to feel “safer”, thus the territorial confinement for our cities sets a climate of separation and distrust which criminalizes the difference, comprising fenced and protected perimeters (BAUMAN 2003, 2011).

## **2.2 Victimization as an engine for territorial confinement**

Currently, insecurity is the argument for many closure interventions in public space, and is linked to victimization. Victimization explains the sense of insecurity as perceived, and the subjective probability of the occurrence of a menacing act. The expectation of a criminal act is determined by experience (personal victimization or direct), or other comments and information that appear credible (indirect victimization) (GIBSON et al. 2002; TAPIA 2007; LÜDEMANN 2006; HAUBRICH and WEHRHAHN 2011).

The sociological context unmasks victimization as a social process of segregation, spatial confinement and vulnerability. Consequently, ideologies do their work in the discussion of what it is, what it is not and what it seeks to hide. Victimization is a complex social process linked to processes of capital accumulation and control of power hegemony, which involves the continuing need for legitimacy of the state and society (TAPIA 2007). It brings together the history, the social and ideological discourses around a person or social group in particular. This construction sets a concrete profile of victim and aggressor.

The legitimacy of institutions of power deals with mediating pretexts on behalf of victims (TAPIA 2007). Thus, the State decisively implements social control through anticipated interventions. Under the name of social mobilization and prevention, an attempt is made to create a scenario of security measures such as co-production between the state and civil society (HAUBRICH and WEHRHAHN 2011; DINGES and SACK 2000). Victimization is a hidden, but effective component of social control. Through fear imposed by a particular person or by the state, social control is introduced by appealing to a sense of individual and collective responsibility of citizens. Public safety, from a critical combination of socio political, police and criminal measures, aims to deepen and strengthen the implementation of social control (HAUBRICH and WEHRHAHN 2011).

According to TAPIA (2007) there is a social structure that facilitates the victimizing confrontation. Victimization corresponds to a conceptual model derived from social conflict, utilitarian and postmodernist approaches as well as the offender’s personal controversy. In the utilitarian model, the victim is sacrificed and resigned as a function of the social group that will benefit from the advantages of this position. In the postmodern concept

there is diversity depending on culture and context. Ultra-liberal postmodernism defends the perpetration of deaths, injuries and misery, under arguments for world order (regional wars, etc.). Postmodernism and moral relativism advocate a tolerance of victimization, victimization by choice and victimization by subject (group behaviour against poor urban neighbourhood contexts) (TAPIA 2007, p. 8).

Thus, victimization justifies the elimination of the other undesirable (either personal or institutional enemy). It appears as a labelling of the weaker and disadvantaged. To blame the victim is victimization just the same. To be in control their reactivity strips the victim of his representation, his rights and autonomy as a person, leaving only pain and suffering (TAPIA 2007, p. 8).

### **2.3 Community, territory and alterity**

Ontologically, community comes first and the process of individualization and personalization can only occur within a community. Thus, the field of action and efficacy of the communitarian world is daily life, which develops in space situational contexts of world life, and the communitarian world has its own rules of production and reproduction (MARTÍNEZ 2006). The community is composed of individuals who share a common being in a shared world. A community is not a collective subject, but is a “community of others”, an aggregate that is built on the principle of alterity.

The reality of the community is its “map” (BATESON 2004), and the map is not the territory, but the interpretation and representation that the community has of this<sup>1</sup>. Each community lives in its own map. Communication flows and coexistence is based on the acceptance of other maps, the emergence of empathy, sharing moments and visiting the maps of others. Insecurity and victimization deny the maps of others. The anticipated public space risk evaluation is immersed in a complexity of perceptions, interpretations, and manipulations of the individual and the communitarian map (MARTÍNEZ 2006).

PIERRE BOURDIEU (1996) explains this distinction by proposing the existence of a set of schemes to act, think and feel associated with the community and the social position from which subjects perceive the world and act on it. These schemes are supported by community differentiation processes in terms of the conditions and needs of each class (BOURDIEU 1996).

Community space is always local, intersubjective and complex, and places individuals in society, assigning them identity, validation, recognition, belonging, territory, language and culture. This determines the spatial and temporal context of people and their com-

<sup>1</sup> The broken windows approach says that the presence of physical and social deterioration is a visible sign of the lack of social control, and this encourages crime and the fear of citizens to leave home (WILSON and KELLING 1982).

munities. All human practice occurs in a “here and now”, which is also the product of a history, relationships and influences of other contexts, places and cultures. Consequently, community practices shape the social environment, they affect it physically. In this sense, the community contributes to reproducing and solidifying social spatial constructions. The sense of community regarding neighbours is based on the principle of alterity and streamlines around insecurity, posing an equivalence between the sense of insecurity and a sense of community: the communitarian sense of insecurity (MARTÍNEZ 2006).

## **2.4 Urban ethnicity**

Alterity studies address the analysis of the discourses of power, their representations of each one and the images of the ideological burdens that legitimize the status quo in power relationships. In this way, they offer a field of valuable analysis and an essential contribution. The effort focuses on the deconstruction of imperative categories of natural and innate inferiority of the other (CAMUS 2006). In this sense, alterity is directly linked to ethnicity.

The concept of ethnicity refers to a process of identity closure (CAMUS 2006; BAUMAN 2003, 2011). This process operates against a person, negatively labelling them according to cultural, gender and social class stereotypes (GARNER 2010). It refers to the association of the poor, dark-skinned male, possibly immigrant and inhabitant of poor urban areas, as the stereotype of the offender, and therefore not a subject of trust. Yet the poor, dark-skinned female, possibly immigrant and living in poor urban areas is admitted into the privacy of residential neighbourhoods in the capacity of a domestic servant. However, her status is unlikely to ever progress beyond a subordinate role<sup>2</sup> (MOLINA 2001; ACUÑA 2011; AGUERRE 2011).

## **3 Methodological approach**

The theoretical and methodological approaches used are intersectionality and grounded theory. They provide the line of argument that the classical models of societal oppression do not act independently. The forms on ethnicity, gender, religion, nationality, sexual orientation, class or disability discrimination, are created and strengthen each other (MOLINA 1997, 2001; GARNER 2010). This methodological approach is used to examine how different categories of discrimination which are socially and culturally constructed, intersect, forming an oppressive system that reflects multiple discrimination (CRENSHAW

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2 Racialization, a concept closely related to ethnicity, was applied by IRENE MOLINA in 1992 to explain the Suecia phenomenon of ethnic spatial segregation (MOLINA 1997, 2001). MOLINA defines racialization as a process that leads individuals and institutions in a given society to think, act and discriminate based on an ideology of race (SMITH 1989; MOLINA 1997, 2001). The belief in the legitimacy of such biological differences has placed much of humanity in social, political, economic and cultural oppression and subordination (MOLINA 1997, 2001).

1991, 1998; KNUDSEN 2006; FANON 1952; GRAHAM 1990; DORLIN 2005, 2007; VIVEROS 2009).

The intersectional approach in sociological theory examines the different categories of socially and culturally constructed discrimination, their interactions on multiple, simultaneous levels, and their contribution to systematic social inequality. Intersectionality suggests forms of oppression that intersect with each other forming an oppressive system that reflects multiple forms of discrimination. Therefore, it is useful for a proper understanding of processes resulting from the intersection of structural pathways (CRENSHAW 1991, 1998; KNUDSEN 2006) and illuminates the multiplicity of factors which affect the understanding of the phenomenon of building boundaries (FANON 1952; GRAHAM 1990; DORLIN 2005, 2007; VIVEROS 2009).

Grounded theory (GLASER and STRAUSS 1967; STRAUSS 1970) provides the methodological platform to discover, develop and test theories, eventually emerging to explain the phenomena under study. It is based on a systematic process of production, data analysis and reciprocal relationship. In the grounded theory methodology model sampling is theoretical-empirical, and is carried out in a dynamic schema to produce information-analysis-new sample/production of information-analysis-new sample, etc. The criterion for terminating the process is saturation, this means, when there is no new information and we have an essentially interpretive model. It is a complementary approach to the triangulation of information sources (KROMREY 2007).

#### **4 The housing question in Chile**

The history of housing in Chilean cities is quite extensive. In twentieth century Chile housing became one of the most important political issues, to the extent that virtually all governments gave it special attention, albeit with varying degrees of success. Although housing conditions for the poorest improved over the years, the problems were never satisfactorily resolved (MOLINA and GALLEGUILLOS 2006). Pinochet's authoritarian regime (1973-1989) used the social housing issue as a political tool, implementing a wide range of social housing programs, questionable as to their construction quality and resultant quality of life.

The extensive eradication of camps that the regime initiated in 1979 had the objective of providing the families involved with solid, permanent housing. However, for political and economic reasons (high land prices) poor families were systematically transferred from areas of high income earners to peripheral areas of cheaply-priced-land, where they settled in small lodgings, with the dual purpose of eradicating pockets of poverty in high income areas, and breaking up the existing organization of poor inhabitants. Between 1979 and 1984 more than 26,000 families were moved from a total of 65 camps to per-

manent social housing. The evaluation of this project leads to the conclusion that a series of social, economic, political and environmental problems were generated as a result of intentionally exclusive urban planning (MOLINA 1985).

## **4.1 Case studies**

This ongoing research is carried out in three developments of the communes of Peñalolén (Parque Violeta Cousiño), Huechuraba (El Carmen) and Colina (Piedra Roja) and their environments. The following criteria determine the choice of these developments:

- The three communes are sources of real estate activity.
- They are gated communities and colonization examples in peripheral contexts of urban poverty.
- Of the three closure models, the first closure is a response of the wider community, in the second the perimeter fence was a part of the real state developer offer, with un-gated, communal areas within. The third case is a complex of gated communities structured around a public space.

These developments represent three types of real estate offers addressed to middle and upper classes.

### **4.1.1 Parque Violeta Cousiño, Peñalolén**

The municipality originates from the subdivision of the municipality of Ñuñoa, during the process of Communal Reformulation of the municipalities of greater Santiago, between 1981 and 1985. With an area of 23 km<sup>2</sup>, Peñalolén is one of the largest municipalities in the metropolitan region, being at the same time one of the areas with the highest demographic increase, with a population now surpassing 250,000 inhabitants.

The municipality of Peñalolén, originally a poor urban area with complex social problems and defined as one of the poorest in the metropolitan region, has now been quite significantly developed. A few years ago, it became a host community for people coming from camps that were eradicated from the metropolitan area; approximately 14,000 people were introduced from other communes between 1982 and 1985, including other arrivals (MOLINA 1985).

Over the last few years, this commune has been subjected to a great deal of real estate investment in housing for the middle and upper classes, something that has transformed the socio-spatial structure, now that it is host to a large number of inhabitants with medium and high incomes. Developers, together with the liberation of land markets have initiated a process of transformation that has provoked a rupture in the urban socio-structural morphology: the spatial segregation “pockets of poverty” in large areas of the urban space

that established great distances between the rich and the poor have begun to erode. To confirm this fact, a paradox: the areas between the middle and upper class neighbourhoods occupied by the homogeneously poor became highly attractive to developers who saw the advantages of living in an area of adequate geographical distance and better environmental surroundings compared to other sectors and to the contaminated centre of Santiago. The suburbs have started to represent lucrative opportunities for real estate development (by the means of lower land prices) and they seek to meet the demand of an expanding middle class that has access to mortgage loans<sup>3</sup>.

Only in the 90s more than 12,000 homes were built in Peñalolen by private investment. From this urban development in the municipality, poor populations have been isolated and socio-spatially segregated, which is the main problem of the urban commune. The socially heterogeneous characterization of the commune, has nothing to do with the generation of coexistence in diversity or social mix, but rather refers to the socio-economic differentiation of the population with socio-spatial fragmentation in areas socio-economically homogeneous (GALLEGUILLOS 2007a).

The social structure of urbanization in Parque Violeta Cousiño is for the middle classes. It has a high degree of physical and structural fragmentation of public space because more than 90% of the passages in the district have been closed with fence gates. These security measures are privately financed in full by residents of the neighbourhood.

### **The illusion of social integration**

In the first few years following temporary and later permanent relocation, it would appear that inhabitants and in particular women, perceived and valued the benefits to their quality of life of a socially heterogeneous urban structure. This is surprising considering the serious conflicts that they experienced for almost two years; the rejection and humiliation from several surrounding residential complexes, and the uncertainty and the demands of their temporary housing space. However, satisfaction was measured based on spatial indicators; street space, neighbourhood space, infrastructure, identification with the neighbourhood and with the surroundings, rather than using emotional or social indicators (GALLEGUILLOS 2000 and 2006). Women principally valued the major reduction in the travel time to work, given that the temporary housing enabled them to find jobs close by. Travel time for shopping was also reduced, owing to the various possibilities of

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<sup>3</sup> The Comunal Reformulation of the Metropolitan Region, derived from the regionalization process and culminating in the dictation of the Decree Law No. 1-3260 of 6 Mar 1981, created 17 new communes in the province of Santiago. These included Peñalolen, a commune homogeneous in poverty. In 1981 Peñalolén had a population of some 110,000 people, many of whom lacked many basic and social services. More than 10,000 lots and homes were not urbanized (GALLEGUILLOS 2007a). The relocation of squatters from other communes to Peñalolén was a practice intended by the military regime to homogenize the population socially at the beginning and end of that decade. Thus, eradication of populations occurred. These arbitrary measures generated an uprooted population, undermining the legitimate right to housing (LEFEBVRE 1972, 1984) and sharpened spatial segregation (GALLEGUILLOS 2007a).

a diverse and functional urban structure, with enough commercial outlets, services and much better communication.

The percentage of respondents that said they had made new contacts in the temporary location over the last two years was quite marked. The situations and places where they established the contacts (central places within the small camp) confirms the tendency of the residents from large conglomerates of poverty to “stay behind the invisible boundaries of the population”, with all that this means for quality of life. In this case the small camp structure favoured contact beyond its boundaries, with residents making new contacts that also had the purpose of improving their socioeconomic situation (GALLEGUILLOS 2006).

In the provisional small camp the inhabitants of Esperanza Andina (now the Población San Carlos, near to Parque Violeta Cousiño) crossed their boundaries, establishing effective contacts with neighbours from adjacent middle and upper class residential neighbourhoods as well as other neighbours from Esperanza Andina itself. This produced a positive effect in the labour and economic situations of the inhabitants, some of whom obtained service jobs in local supermarkets or private households, etc. The theory acquires significance due to its diverse structure and geographically reduced conglomerate of poor inhabitants that enabled these contacts<sup>4</sup>. However, this process of social integration was then faced with a new, extremely limiting component which has become very

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4 The seizure process, the assertion of dignified housing and participation in planning and management of the permanent housing of the people from the Esperanza Andina estate between 1992-2000 contained several aspects that converted this into a case of great importance in the history of illegal squatting in the city. Particularly interesting is the resultant movement of the poor, compared to previous seizures originated in Chile. The group of people who led the occupation of land in Peñalolén were exemplary in their organization. They created committees where men and women participated actively, with an organization based on the formal distribution of functions and tasks. This process was in great part led and directed by women, who began the generation of self confidence and the rights movement in Chilean society, similar to other societies worldwide. These, apart from being classist are noticeably patriarchal (MOLINA and GALLEGUILLOS 2006).

But, the owners of the houses within the Valle Oriente community did not welcome the social proximity of the settlers, which produced a conflict between classes in Peñalolén, triggered by the negative reactions of the wealthier neighbours. Four protection officers were put in place by those living in the Valle Oriente residential complex, through which they revealed their complete rejection to the temporary transfer of families from the Esperanza Andina seizure to a place adjacent to their residential complex. Meetings were held between the settlers, the mayor and the residents of the Valle Oriente complex “affected” by the proximity of the camp, the settlers wanted the best solution for everyone involved. However, the residents of Valle Oriente proposed solutions that did not contemplate a coexistence, but instead sought a distancing of the settlers with a transferring of “them towards the hill”, where “they would be better off”. The settlers felt so humiliated and exhausted by the events and effort involved in the transfer of their huts, so much so that they became willing to accept the construction of a “really high” wall, so that the neighbours would not be obliged to see the poor and so that the problems would end (GALLEGUILLOS 2006).

Owing to the vulnerable position in which they found themselves, and with the imminent risk of eviction, the inhabitants placed a priority on a collective organization of the land occupation movement, implementing a strict system of rules and routines with a high level of internal discipline. The significant status of female leadership was widely acknowledged and legitimized by the community, who actively participated in the structural organization of the camp, assuming all level of duties. This active participation was in fact one of the requirements established by the movement in order to continue to form part of the community. (MOLINA and GALLEGUILLOS 2006).

widespread in cities: the closure of public space, streets and passages, in order to improve safety within the city.

On one hand, the residents of the area – in favour of the gate –, stated that they felt more protected with their streets closed off. In this way, the socio-spatial diversity remains “behind bars” and the neighbourhood is an expression of the insecurity of its residents. What is clear is that the gates hide a longing to establish homogeneous communities behind them and protect themselves from “other” poor people. The development of the security in the community of Parque Violeta Cousiño in Peñalolén was based on the control of the accesses to the point where the condominiums remained isolated from the rest of the community, as much in design, with intricate passages, as in more drastic solutions such as the fencing off of their perimeters in the complexes that were most exposed to Avenida Grecia. The closure of all of the passages leading to Avenida Grecia, concealed – in quite a visible way – a feeling of fear concerning the area directly opposite these new complexes, the area of Peñalolén Alto.

The closure of passages in various communes of Santiago is a method of finding an immediate solution to a sense of insecurity in the area. It creates an illusion instead, increasing socio-spatial segregation, social conflicts and divisions generated by the fencing off of the streets. It brings an apparent security to the neighbours, but contributes to the generation of social resentment in a vicious circle, which is difficult to overcome. Besides, the fences augment the feeling of insecurity when one is outside of them:

“Anyone who continues along Avenida Grecia, after crossing Tobalaba, can see how the residents seek to privatize the adjoining streets with gates. The municipality is fully aware of the illegality of this, but has turned a blind eye and allows this violation to one of Chileans most basic rights: Free movement within the streets that belong to the city as a whole. At night, things get worse as the number of entrances are reduced and to enter these housing developments it is necessary to travel 15 blocks. I refer to the Violeta Cousiño housing complex”<sup>5</sup>.

#### **4.1.2 Gated community El Carmen de Huechuraba**

The urban project of Carmen de Huechuraba is located in the northern part of Huechuraba, in a quadrant apart from the rest of communal activity. This neighbourhood was developed under President Eduardo Frei Ruiz-Tagle in the context of the continuity of the neo-liberal economic model. The value of land on the periphery of the city in the 1990s was very low, which encouraged profit maximization of real estate investing, holding large real estate projects whose offer was devoted to the high socio-economic segment, with the

<sup>5</sup> Neighbour: URL: [http://www.reclamos.cl/reclamo/2009/jun/municipalidad\\_de\\_pe\\_alolen\\_privatizaci\\_n\\_de\\_calles\\_y\\_pasajes](http://www.reclamos.cl/reclamo/2009/jun/municipalidad_de_pe_alolen_privatizaci_n_de_calles_y_pasajes). Accessed 19 Aug 2012.

promise of an exclusive lifestyle transformation of the social structure of the community. Currently the population of the Carmen community is of the upper-middle social class, mostly professionals with borrowing capacity. It was established about ten years ago as a community united in the common desire to access a comfortable, safe and exclusive lifestyle (socioeconomic status C1: medium-high), which has given rise to a strong social fragmentation in the commune. El Carmen de Huechuraba, is located on an area of 140 hectares, with homes ranging from 140 to 250 m<sup>2</sup> of construction, on plots of 400 to 700 m<sup>2</sup>. The isolated location from the rest of community activity, along with its management and security system, allows an interior landscape of houses without security railings.

Huechuraba was founded in 1981 but officially started as a territorial administration in January 1992. The district master plan is in the approval process. Development is regulated by the Santiago Metropolitan Master Plan (PRMS) and the Master Plan of Conchalí, which do not fit the reality of the current communal urban growth (Municipality of Huechuraba 2003).

#### **4.1.3 Urban project Piedra Roja (Colina)**

Piedra Roja is a 1,300 hectares mega-project with twenty years of development, in the Chicureo Valley, in the commune of Colina. It includes the construction of 12,500 houses for a homogeneous socio-economic population, commercial equipment, health, education and sports facilities and cultural services. It has an estimated population of 100,000 people with families of two to three children on average. Piedra Roja is projected as a self-sufficient city in time, oriented to recreation in a natural and safe environment. The project has a defined service strategy, a navigable lagoon of eight hectares, an extensive network of bike paths, a golf club and over 30 m<sup>2</sup> of green area per inhabitant with innovative landscaping concepts: A yacht club, a mall and the highway Juan Pablo II to join Piedra Roja with La Dehesa in ten minutes. Furthermore there are several schools and a shopping centre with a supermarket, employment areas, etc. Two main entrances communicate directly with this neighbourhood, the Northeast Radial Highway connects directly to Vitacura, with the Juan Pablo II Highway connection to La Dehesa. It has controlled access, and the project promises security, privacy, independence and access to nature and calm while enjoying the benefits of a comprehensive urban development with a large commercial development, and educational and recreational facilities, typical of a traditional neighbourhood.<sup>6</sup>

## **5 Discussion**

Like most Latin American mega-cities, Santiago de Chile's expansion has been accompanied by spatial segregation, which has been explained as a process and product of

<sup>6</sup> URL: <http://www.piedraraja.cl/> ; <http://www.colina.cl/>. Accessed 5 May 2012.

socio-economic stratification and the growing gap between rich and poor in Chile (BÄHR and RIESCO 1981). The facts show that in Santiago's case this segregated socio-spatial structure was caused by urban policies of eradication and the intention of founding new communes to standardize the population for social order. Until the beginning of the last decade (2000), the resulting urban structure was geographically characterized by physical distances between neighbourhoods of different socio-economic groups, large areas of poor, homogeneous social developments, stigmatized by informality, crime and violence and a restricted access to infrastructure (MOLINA 1985; GALLEGUILLOS 2000, 2004, 2006, 2007a, b).

The new pattern of spatial segregation, which fits the concept of territorial confinement (fence pattern of public space) first coined by BAUMAN (2003, 2011) has been generalized to most large cities in Latin America (PLÖGER 2006a, b, c). Meanwhile, over the past two centuries and on a macro, worldwide level insecurity has gained importance in the debate. Since the eighties, Latin America has entered an age of insecurity (DAVIS 2006). Accordingly, trends forming a societal insecurity syndrome can be recognized. For example, insecurity in Peru is not justified by the terror of the 1980s and 1990s, but by the probability of the unpredictable (REYNA and TOCHE 1999). The trend in the scientific debate also points to a supposed causal link between a general change in society and the emergence of insecurity. This argument relates to processes of individualization associated with "flexibility", which produces insecurity (BAUMAN 2003, 2011). In another line of argument, there has existed in public debate since the 1970s the growing sense of insecurity among the population that appears as common sense when viewed alongside the crime factor. The potential uncertainty directly impacts on both those affected by crime and potential victims (WEHRHAHN and HAUBRICH 2010).

Chile, compared with other countries in the region, has a low rate of violence, less than the global rate (measured by the murder rate). This is despite a growing phenomenon of social polarization by the precarious living conditions of large numbers of the population due to the implementation of programs of deregulation and flexibility (CIPER 2010). It is interesting therefore that the Santiago metropolitan area has the highest perceptions of insecurity and socio-spatially differentiated power (PAULSEN 2008; BRICEÑO-LEÓN 2008; CIPER 2010).

As a result of the investment in homogenous sectors of urban poverty, a change in the spatial segregation pattern has come about (SABATINI et al. 2000; SABATINI and CÁCERES 2012; GALLEGUILLOS 2004, 2006, 2007a, b). This scenario brought various kinds of implications for all socio-economic groups involved. Furthermore, in an objective, public and verifiable form, the last decade saw the beginning of an increase in a new exclusive behavioural pattern characterized by community practices of territorial confinement. This

was characterized by the progressive closure of passages and streets, associated with geographical proximity.

There is no direct correlation between the development of crime and the perceived sense of insecurity in society. In this case and according to WEHRHAHN and HAUBRICH (2010) the sense of insecurity is widespread and appears to be of greater importance than the actual threat. This is evident in the study that processed information CIPER Chile and unified criteria used by public prosecutors North Central, East and West of Santiago, and the police, to map the three most common types of burglaries in the Metropolitan Region (CIPER 2010)<sup>7</sup>. Comparing the map of 2009 with the previous years, it became clear that with minor modifications the main crime centres remained the same. Offenses are repeated in the same places year after year and the most dangerous areas of Santiago are still readily apparent. The causes, among others, point to an action of generalized stigmatizing exacerbated by television and mass media (CIPER 2010).

In Chile, further explanations are needed as to what brings thousands of residents in the most populated communes of Santiago to organize the closing of over 800 streets and passages<sup>8</sup>, in spite of this being an illegal act (roads closed by residents concentrated in Maipú, Peñalolén and La Reina)<sup>9</sup>. At the same time this perception has no consistent correlation with objective risk indexes in Chile (PAULSEN 2008; DAMMERT et al. 2003)<sup>10</sup>. A territorialization process of the crime phenomenon is evident, which extends beyond the points indicated in studies such as CIPER 2010. This territorialization lowers the symbolic capital of the people who are already subject to socio-spatial segregation, and increases the symbolic capital of those most favoured by socio-economic order of the state.

Due to those findings, territorial confinement expresses the new fence pattern of public space as a form of spatial segregation that acquires a socio-economic stratification in the city of Santiago. External territorial confinement in the case of poor communities, constructed by the community outside, but also auto confinement, typically motivated for reasons of security (BAUMAN 2003, 2011). The media in Chile applies a representational model of poverty and exclusion. The symbolic management of communication of this topic helps to streamline the process of territorial confinement powered by the community's

7 The deficiency in the systematic collection of data and reports, as well as the low credibility and objectivity of crime statistics that guide the police is a serious hindrance in the systematic evaluation of this phenomenon (CIPER 2010).

8 In high-income sectors the phenomenon is not so marked. In Providencia there are only 13 cases of closure of passages. In Las Condes public passages differ (there are 47 in the commune) from private passages (35). In Vitacura, one of the districts with the highest rates of direct victimization, only 34 entrances to passages are gated fences. In the commune of Santiago only 10 public passages and streets have been authorized for closure, from 1998 to date (El Mercurio 12 Jan 2010, 2 Oct 2009).

9 El Mercurio 2 Oct 2009

10 On 16 September, the Fifth Room of the Court of Appeals of Santiago, with the case of the street Manquehue of Cerrillos, confirmed the position of the Contraloría General de la República in that the streets or passages are national goods for public use, so they cannot be closed (El Mercurio 2 Oct 2009).

sense of insecurity, while most examples of external confinement lower the degree of control that poor communities have on their representations and public identities.

However, the resulting urban lifestyle between new and old residents is determined by a dialectic of fear and insecurity. New residential neighbourhoods arising to satisfy a middle class market have begun to be established in close or direct proximity to boroughs originally characterised by housing projects for the poor, with poverty perceived as a threat and characterized by means of separation with the use of walls and fences. The original inhabitants of the neighbourhood live fully aware of the painful and humiliating process associated with this segregation. Despite the perception that this proximity excludes the possibility of community integration, poor inhabitants often perceive this structural change of urban social morphology as providing certain advantages.

### **Towards social mix**

In the Latin American context as in general, discussions concerning methods of improving the quality of life in cities have now become relevant. Particular reference must be given to socio-spatial diversity, also termed socio-economic heterogeneity or “social mix”. There are various ways of understanding socio-spatial diversity such as in the context of interactions between generations, different ethnic groups or between rich and poor within a community. However, understanding this concept is now a vital tool in strategic planning, generating the possibility to save the city as a whole from a process of social segmentation. Similarly, promoting new connections and networks that support community cohesion in the reduction of conflict and its causes, counteracts the process of self-segregation (living behind walls and bars) and in general promotes the sustainable use of urban space. In this sense, the focal point of discussion is the possibility of creating spaces of social diversity, synergetic in nature, which enables residents to experience a certain quality of life.

Through effective media education policies this situation of fear and insecurity can be reversed: with technological advances that increase interactivity and convergence, the media becomes a powerful tool for social participation and empowerment, yet is underutilized by the public, at least in Chile. With public participation, on the one hand, self-regulation of individuals and communities would be encouraged, and on the other, co-regulation initiatives – in which citizens and state institutions cooperate in regulating the media – would be enhanced. This would then present the opportunity for people and communities to negotiate their identities in public space and thus have greater control over their social inclusion processes.

Insecurity can be approached from the perspective of solving a potential social problem, on the assumption that the insecurity decreases with the inclusion of a person or community in the neighbourhood. This approach offers theoretical and methodological ways to analyze and understand this phenomenon, towards the search for solutions for breaking

the vicious cycle of insecurity, segregation and social exclusion (WEHRHAHN and HAUBRICH 2010).

An optimal situation of social integration would be where there was no social differentiation, “social diversity without exclusion”, where the outer limits of the areas occupied by each group is diffused. This vision encompasses previous concepts where urban areas were made up of streets and public spaces where people from different social backgrounds could interact, near to residential areas.

## **6 Conclusions**

The persistence of the process of disarticulation that the majority of the Chilean inhabitants from preferential neighbourhoods from large cities are exposed to the blocking of relationships between neighbours, the discrimination between the rich and the poor in the allocation of urban infrastructure and private initiatives, and the harshness of the living conditions in the city that in recent years has been aggravated by an increase in violence and crime, present the unavoidable issue of the social impact of urban development.

Similar to the majority of other Latin American mega-cities, Santiago (Chile) has not escaped a process of expansion, accompanied by socio-spatial segregation and subsequent exclusion, a phenomenon that has occurred for decades, and that since the second half of the 70s has mainly affected inhabitants belonging to low socio-economic groups.

Events illustrate that this process has been consciously provoked and supported by urban policies. The result is a socially fragmented urban structure in the homogeneous sectors, which make up the boroughs. The inhabitants of homogeneous poor sectors principally on the outskirts of Santiago are faced with restricted access to urban infrastructure, social stigmatism, crime and violence. These are factors that perpetuate the vicious circle of poverty and the precarious standard of living, stifling the efforts of inhabitants in achieving improvements to their quality of life.

For decades, spatial segregation in Santiago de Chile was characterized as a result of socio-economic stratification together with the growing gap between the rich and poor populations in Chile. Nevertheless, in recent years, this “classic” pattern of spatial segregation changed scale in Santiago. The housing investment in homogeneous poverty sectors has generated geographical proximity between residents of different socio-economic stratification.

Consequently, a community practice of closure of passages and streets is a new form of interaction between different neighbouring groups. The way has been paved for open conflict and direct confrontation, apparent social integration. This form leads to spatial confinement as a product of geographical proximity. Three examples of spatial confine-

ment are presented as part of an ongoing investigation to study the role of community systems in the production of spatial confinement in Santiago de Chile.

Both in the Latin American context and in general, socio-spatial diversification has become of great relevance, particularly in discussions surrounding the need to reduce segregation and its subsequent social exclusion, by means of measures that promote socio-spatial diversity or a “social mix” as the central objective of a strategy for socially sustainable urban development. Awareness in relation to the perception of urban space, from the point of view of those affected, especially according to their degree of satisfaction with housing, constitutes a critical tool in establishing social structure, in achieving sustainability and socially balanced urban development. What the city needs is not fences, but bridges that help overcome issues of crime, security that should be considered in the design of the cities; this should be complemented by public policies that quench the feeling of vulnerability with concrete solutions for its citizens.

In terms of future planning, it is critical to consider the need for acknowledging the areas of great differences between neighbours in an intensive urban lifestyle. It should be possible to accommodate these differences and for this, the public spaces avenues and streets of large cities should be equipped well enough to allow people from “outside” to coexist in a peaceful, respectful and dignified way. The differences between groups should be able to be expressed openly across the formation or constitution of affinity groups. Social and spatial differentiation should not be exclusive, but rather a matter of social awareness and collaboration. Urban life generates social contradictions and differences, representing the challenge of a coexistence differentiated by its history and sociological feeling of community.

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## **Selective Mobility: The Impact of New Concessioned City-Motorways on Segregation Patterns – The Case of Santiago de Chile**

Gonzalo Oroz (Weimar)

### **Abstract**

The present work aims to analyze the relationship between rapid economic growth, privatization of public works and social segregation by exploring the case study of Santiago's recent developments in road infrastructure. Until the end of the 1970s, Chile was placed in the middle of the development scale among South American countries. After the radical introduction of neo-liberal market economy measures under Pinochet's dictatorship, the macroeconomic growth of Chile stressed an unstoppable demand for new roads and motorways (highways) especially in the over-urbanized area surrounding the capital city. As early as the late 1980s, just after the re-introduction of democracy, private investors made great demands on the government/state (Estado), calling for the extension and improvement of road infrastructure in order to enhance the booming economy and maximize profits. The Chilean government and its agency (ministry) for infrastructure MOP (Ministerio de Obras Públicas) was unable to accomplish such a task, especially due to many other pressing demands with direct social impact such as hospitals or local roads in far-flung and isolated regions. The solution was to privatize the planning, the construction and the running of major motorways in central Chile, a logical step as the private sector was well accustomed to free market orientated mechanisms. But the changes in the road network brought long lasting polarization problems to a head, especially regarding socio-spatial segregation.

## **1 Historical relationship between road infrastructure and segregation**

### **1.1 Santiago's first century: from military fortress to colonial city**

As almost all societies in Latin America, Chile is a social product whose roots lie in the violent conquest made by the Spaniards. At the beginning of the colonial period the Captaincy General of Chile was actually a compound of several military outposts rather than a proper colonial territory. All the major settlements were in point of fact military strongholds. This situation was a response to the Mapuche tribes that constantly defied every attempt to conquer the territories located south of the Maule River.<sup>1</sup>

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<sup>1</sup> The Maule River was the former southern frontier of the Inca Empire. For the Incas it was also impossible to get beyond this natural border mainly because of the fierce resistance of the Mapuche. For the Spaniards the military situation was not better than under the period of Inca domination; only by establishing a special military unit (The Frontier Army) could the constant menace of the Mapuche be kept under control (VILLALOBOS 1995, pp. 35-44).

Santiago was actually founded by the conqueror Pedro de Valdivia but the location was indeed a former Inca settlement (DE RAMÓN 2007, p.17). The Spaniards also used the Inca road-system along with other Inca facilities such as the “*tambos*”<sup>2</sup> to accomplish the conquest of the Chilean territory (GREVE 1938, pp. 145-146). During this first period (from the middle of the 16<sup>th</sup> century to the beginning of the 17<sup>th</sup> century) Santiago was a fort where every citizen was compelled to defend the city. This was not only because of the severe menace of the Mapuche who had destroyed the city twice during the 16<sup>th</sup> century, but also due to the fact that almost all the white population were military personnel who had come to Chile as a result of the minor civil war in Peru (1544 and 1548), unrest which cast Peruvian territory into political instability until at least 1554 (PREM 2008, p. 85). The strict social and rank segregation within the city walls was the starting point of later segregation patterns; the commanders and principal political personnel lived in the very centre of the city, officials of lower rank and foot soldiers occupied peripheral locations (BÄHR and MERTINS 1995, p. 12).

## 1.2 Towards a colonial city structure

The great Mapuche rebellion in 1598 was followed by a relatively long period of peace during which urban society became increasingly complex by incorporating a *mestizo*-population and pacific Indian population. At the same time there was a small but socially important migration of Spanish officials and artisans that swelled the city periphery (DE RAMÓN 2007, p. 57). Gradually Santiago’s society became more and more sophisticated; urban life was strictly normed and every social group had to fit into its specific space in the city. Description of the complexity of the spatial and social relationships of the different social groups during the colonial period requires a very judicious approach, which can then shed light on past realities that we hardly comprehend. CARLOS REBORATTI (1999, p. 40) alludes to the importance of the multiple urban or geographical scales on which social phenomena occur. He speaks of at least three different scales: the micro and medium scales, which are used especially in anthropological studies, and the macro scale, which plays a crucial role in sociological approaches.

The complex socio-spatial image of Chilean society during colonial and pre-industrial times permits a classification of at least four levels:

- the microcosm of the colonial house,
- public space,
- urban space,
- the peri-urban and regional scale.

2 “*Tambo*” is a Quechuan word for a lodging facility; the “*Tambos*” with their food storerooms served as relay or post stations for Inca messengers.

By analyzing travellers' reports<sup>3</sup> and historical data we can infer that on each scale roads play a significant role by establishing social barriers. The roads had a dialectical function in the space-configuration mechanisms. On the one hand roads were a means of communication between the different social groups; on the other hand roads were impassable barriers or set strict limits.

**The colonial socio-spatial configuration of Santiago and its surroundings**

Based on the available historical evidence and findings we can reach the conclusion that the social and spatial structure of colonial Santiago de Chile was fairly complex, but also very strict. Absolute freedom of movement was limited to men of the upper class. All other groups had to comply with a very strict and limited use of space. A “disciplinary” use of space in FOUCAULT’S sense (2008, p. 839) prevailed at all spatial scales, from the microcosm of the colonial house to the entire urban area. There was a pattern that could be called a babushka model.

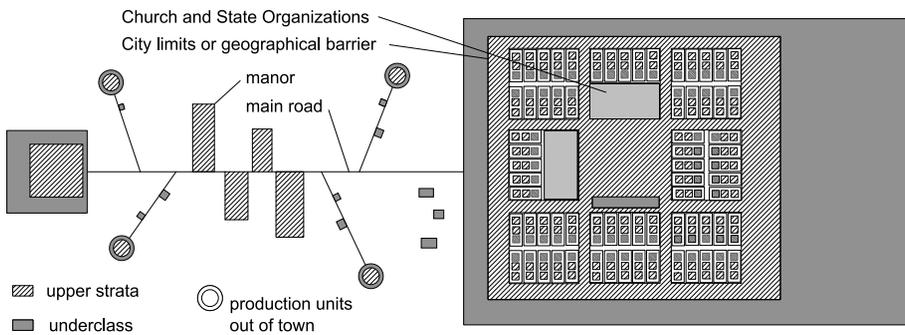


Figure 1: Proposed model for the late colonial and early republican city  
 Source: Design by OROZ

Every time when a person from the lowest social strata wanted to leave a certain area or escape from its influence (Figure 1), he or she was automatically subjected to a higher level of segregation or social control. This clear use of the space ensured that the socio-spatial structure of the city remained without significant change over centuries, at least from 1620 to 1840. The rigid socio-spatial configuration was actually a reflection of the long-lasting productive structure of the country; only after a radical change in the main emphasis of production, and especially in the trade policies, was the capital city to begin to adopt new socio-spatial configurations:

3 Travellers' diaries give us an accurate view of the socio-spatial configuration of the city of Santiago during the late colonial and early republican period; among others, the author drew on the work of FRÉZIER (1982); GRAHAM (2003); LAFOND DE LURCY (1911) and PÖPPIG (1960).

“Viewed from the economic point of view, the independence of Chile meant for the nascent republic the definitive elimination of all institutional barriers of the colonial period that prevented the connection to the world economy.”  
(CARIOLA and SUNKEL 1982, p. 25)

Nonetheless the socio-spatial structure of the city during the colonial era was, indeed, the basis for later segregation patterns with upper classes in the centre and lower classes at the periphery.

### 1.3 The traditional segregation pattern in Chile and Latin America: the connectivity factor

During the decades of the 1840s and 1850s Santiago adopted the traditional segregation pattern for the capital cities of Latin America (GORMSEN 1981, p. 293; BORSODORF 2003, p. 40). The shift from a predominantly agrarian economy to an economic structure based on mining set in motion a strong wave of migration; women moved to the periphery of major cities and men went to the mines. On the other hand, openness to foreign markets meant the arrival of many foreign businessmen, changing not only the production spectrum in the city but also some of the social structures (SALAZAR 2009, p. 133). And in fact the booming economic activities brought about an unstoppable migration from the countryside to the city. Parallel to these developments some speculators started to develop new neighbourhoods (DE RAMÓN 2007, p. 142) by establishing new roads to peripheral areas of the city, especially to the west and the south. There was no kind of further development, each and every settler simply built his own hut using the clay soil. This resulted in the

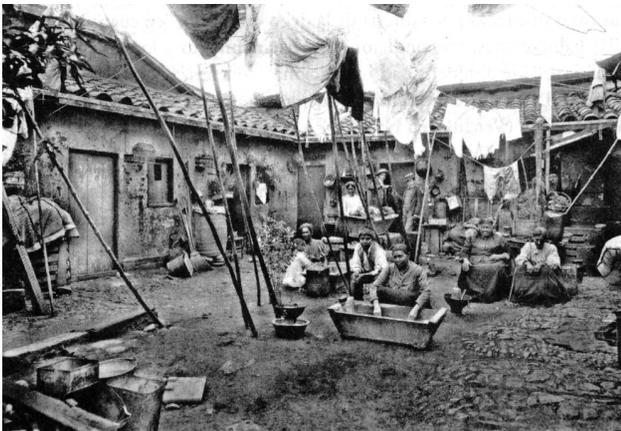


Figure 2: A “conventillo” in the late 1890s; the traditional unit of a slum, established by land speculators

Source: Photograph by G.H. Olds, National Library Chile

houses standing below street level, exposed to winter flooding. These slums were the origins of the so-called “conventillos”: that consisted of a long corridor or courtyard with very simple and unhealthy<sup>4</sup> housing units arranged along their sides.

The principal City Mayor appointed in 1872, Benjamin Vicuña Mackenna, had a clear vision of what the city was and how different social groups should interact:

“Vicuña Mackenna wanted to isolate the city of Santiago, he thus built four axes or roads that would define the scope of the city. This line means a kind of segmentation between the civilized world and rude, uncivilized life [...] As long as these groups continued to live in barbarism, they would be condemned to the periphery.”  
(WEHNER 2000, p. 82)

Vicuña Mackenna’s idea was to create a clear limit (he also named it a sanitary barrier). But in fact this new road, part of which was to bear his name decades later, served in effect as an ideological barrier to separate social classes; even today this great avenue serves to distinguish the normal city from the upper-class city.

During the first third of the 20<sup>th</sup> century there was a little armistice in the fight between transportation systems and social cohesion. The street-car system of Santiago was maybe one of the most sophisticated in the whole of Latin America. In fact Santiago inaugurated the first tram in 1858 (PEÑA OTAEGUI 1944, p.484) and, after several decades of operating horse-powered trams, the tram network was electrified using German vehicles and technology. By 1930 the network coverage was such that all districts, rich and poor, had an adequate transport service. After World War II a gradual decline of all electrical public transport systems (trams and trolleys) began. By 1965 there were only a few lines operating trams in Santiago (MORRISON 2008, p. 11).

#### **1.4 The housing demand and new limits**

During the 20<sup>th</sup> century and especially after the 1920s the state-driven industrial boom was concentrated mainly in the capital city. The attraction of the concentration of industry accelerated the already unleashed rural-urban migration (WILHELMY and BORSODORF 1984, p. 159). By 1940 not even the state and private developers together could meet the demand for housing. There thus began a steady movement that redefined the poor periphery of the city. People were tired of waiting for incomplete and inefficient solutions and proceeded to occupy land illegally. Between 1940 and 1952 the area devoted to housing grew by 40% and only two of the 17 communes of the time retained their predo-

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<sup>4</sup> For more information about the unhealthy conditions of the first conventillos see the work of ROMERO (1984, p. 62) regarding the smallpox epidemics during the years 1872 and 1876.

minantly rural character (ESPINOZA 1998, p. 74). This movement reached a climax with the largest illegal land acquisition, the so-called “toma de la Victoria” on October 30<sup>th</sup> 1957, which gave rise to the settlement of the same name. These slums were by that time called “poblaciones callampa” (literally, mushroom settlements, because of their rapid growth) and were the product of well-coordinated actions, organized so that each family was assigned a place and a specific strategy. But coordinated action was not sufficient to ensure the quick completion of definitive solutions or systems of basic services like water and electricity.

The territorial expansion of the slums to the south of the city and to a lesser extent to the east and west was defined in terms of its scope and its separation from the rest of the population by the road infrastructure. On the occasion of the organization of the Football World Cup of 1962 a fledgling road plan for the city of Santiago was established; this plan culminated in the complementary plan of 1969 with its two long axes and the city ring expressway. And it was precisely this city ring that in the late 1960s served as an ideological demarcation between the formal city and the informal and poor periphery. Furthermore, this very same plan was the basis of the present urban highway system.

## **2 The highway lobby and its allies in the 1950s and 1960s**

One of the most important factors contributing towards the adoption of a new model of urban development, especially in regard to understanding the city and its transport issues, was the paradigm shift from a purely European paradigm to an American paradigm. By the late 1920s the influence of the garden city model was considerable, especially in new neighbourhoods that attracted the young professional class.<sup>5</sup> Young professionals felt the influence of the Anglo-Saxon model in terms of both lifestyle and urban planning. By this time, a period of transition between the late 1920s and the end of World War II, the urban transport system had a distinct European stamp. There then followed a subtle shift towards the U.S. model, which finally prevailed after World War II. Tram technology, mainly from Germany, was replaced by trolley buses imported from the U.S. This was certainly not only for political reasons. The simple fact was that Europe was not able to export anything to Chile in the wake of the massive wartime destruction of its industry and Chilean industry was not able to tackle this challenge itself.

But one of the most powerful movements for the adoption of a new paradigm concerning the urban transport system was the so-called “highway lobby” (MIRALLES-GUASCH 2002, p. 105). The actions of this lobby must be understood within a much larger framework. They were part of a hegemonic shift towards creating a clear area of influence whose main function was to produce suitable conditions from which to confront the enemies

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<sup>5</sup> This was the first neighbourhood shift of a portion of the upper class as described by BÄHR and MERTINS (1995, p. 111).

of the Cold War: The early policy of the Eisenhower administration towards the Third World in general and towards Latin America in particular was, roughly, twofold. In the security sphere, the policy could be summarized as one that stressed military pacts and military aid to support governments that were aligned with U.S. interest in the Cold War. In practice, this meant governments that were actively opposed to all perceived, real or not, communist threat (PORZECANSKI 2005, p. 6).

The battle against communism included strengthening economic partnerships and, if possible, favouring American industry. Within this framework President Eisenhower's administration sent a group of experts on public transport to Chile in 1958. In a working symposium the group proposed the strengthening of roads, especially expressways that were then virtually non-existent (PÁVEZ REYES 2006, p. 263). Shortly after the visit of the technical delegation, and in accordance therewith, Henry Ford II visited the country to promote the construction of auto assembly plants in Chile. Likewise, at the hemispheric level, the IDB was created in order to finance, among other things, road infrastructure projects.

## **2.1 Internal combustion vehicles instead of trains**

At the same time that the expansion of the road network was being promoted, traditional systems such as rail and tram languished (THOMSON and ANGERSTEIN 2000, p. 257). From the late 1950s but intensified from the early sixties a comprehensive investment program for roads was driven at both national and local levels. One of the focuses of this program, the idea of which dated back to the 1920s, was the construction of a Pan-American highway (BÖRGEL 1965, p. 14). The efforts put into expanding the road network were accompanied by a greater availability of vehicles with combustion engines. Although the construction of new assembly plants was completed, in the population there was but little acceptance of American cars. The cars were seen as being too big, with high levels of fuel consumption, and were considered bad taste compared to European models. The Chilean upper class preferred European models and the middle class could not access the American models. So, while it was the Americans who started the business, eventually the Europeans – with their cheap and sober models – won the war for the automotive market. Both the banks and the state created a series of credit facilities for the middle classes in order to facilitate their purchase of cheap cars, usually a Citroën 2CV or Fiat 600. The American assembly plants focused on the production of pick-ups and trucks. In the end it was only the use of the truck-chassis for low cost buses for urban transport that saved such plants from bankruptcy.

## 2.2 City planning: the equivalent of road planning?

The first serious efforts towards modern urban planning took place at the end of the 19<sup>th</sup> century. Many of these projects were undertaken by teams of municipal city planners. But none came fully to fruition, although there was substantial improvement to drainage systems (PÉREZ et al.2005, p. 73). These early efforts faced huge bureaucracy because they were “products” made by subordinates without any decision-making power. A different approach was taken in the early twentieth century. The idea now was to have international proposals, such as the one (1913) by the Ernest Coxhead planning office based in California (MARTÍNEZ LEMOINE 2007, p. 9). All these plans diverged somewhat from the Spanish tradition of the checkerboard and proposed elevated bypasses and diagonals.

Eventually one of the plans from the first third of the 20<sup>th</sup> century could be realized in part. The Viennese architect and planner Karl Brunner was smart enough to be heard by the authorities, who adopted his plan as a basis for the future growth of the capital city (BRUNNER 1932). Brunner also outlined strategies for the future use of expressways. And certainly Brunner’s actions not only had an effect on the area that best illustrated his plan, the central district near “La Moneda” (the seat of government), but had a long-term effect in terms of influencing planners who later would take charge of structuring the city, the best example being the architect and planner Juan Parrochia. Parrochia was not only the chief planner of the PRMS-Plan of 1960,<sup>6</sup> but also the driver of the subsequent Transportation Plan of 1969, which provided the structural basis for the future plan of urban highway concessions. The original plan of 1969 considered not only enabling expressways (also called corridors), but was also a plan which gave great importance to coordination between different transportation systems like metro and light urban trains; however the subway was only developed into a real network many decades later and the light railway was never seriously considered.

All in all the privileging of the use of internal combustion vehicles received a final boost during the military dictatorship when import tariffs were reduced and the local market opened to automobiles that had been assembled abroad. This was closely related to the brand new economic model imposed by the dictatorship.

## 3 From socialism to neo-liberalism

### 3.1 The coup and the shift of paradigm

The election of Dr. Salvador Allende Gossens in 1970, the first socialist politician in Latin America that came to power through democratic elections, was a great event from

6 The PRMS 60 (Plan Regulador Metropolitano del Gran Santiago), developed in the Ministry of Public Works MOP in 1960, was the first wide-spectrum instrument that came to regulate the entire metropolitan area of Greater Santiago. This first instrument and its successive updates determined the present zoning and road structure of the capital city.

a political point of view. The government of Allende tried to deepen the system changes that had already been initiated. But he could control neither certain destabilizing actions of his political allies nor the increasing polarization of Chilean society. The very turbulent period of President Allende's government ended in 1973 in a violent military coup, which was supported by conservative groups and the political right. The new government had no plan with which to address the serious economic and financial crisis. During the first two years the government fought the crisis unsuccessfully. Then a small but influential group of economists from the Pontificia Universidad Católica, most of whom had taken doctorates in Chicago, presented a plan called "el ladrillo" (the brick) containing a series of measures aimed at reducing the size of the state and favouring the action of private entities:

"After a severe economic recession in the years 1975-6 (produced by the application of the shock treatment), there followed years of economic improvement. In 1978-81 the Chilean economy continued to grow rapidly, and many economists in Chile and abroad began to talk about "the Chilean Wirtschaftswunder". The strongest supporter of the neoliberal plans inside the military junta was General Pinochet himself."  
(SILVA 1991, p. 395)

Early promising results led to the formulation of the so-called seven modernizations, which ultimately represented the axis of the military government's (1973-1990) program: labour reform, pension reform, municipalisation of education, privatization of health insurance, the internationalization of agriculture, the judicial reform and the restructuring of political-administrative structures through the creation of new regions instead of provinces. With the exception of the political-administrative and the judiciary reforms, all other reforms aimed at shifting the burden of activities to the private sector.

### **3.2 Housing in a neoliberal context**

The social housing system promoted by the military government was successful in giving fast and efficient solutions for a growing number of families. However, for the military junta and their economic and political creed dwelling was not a fundamental right of the people, but a commodity that must be acquired through family savings. The paradigm shift was verified through the subsidiary role taken by the state, with the state focusing on supporting demand and not supply. This revolutionary step ensured long-term success in terms of coverage and housing deficit reduction, unique in all of Latin America. State subsidies, construction by private companies, and the requirement for affordable amounts of savings was, and still is, a successful formula that has fought the quantitative housing deficit. However, the germ of social unrest underlay the sense of government achievement produced by the figures related to the housing policy. The government was not able to see that solutions should be comprehensive and not reduced to the mere delivery of houses.

### **The resettlement policy: a formula for polarization**

Utterly at variance with the neoliberal policy of the military government was the planned resettlement policy for populations living on land that had been illegally seized. At a time when everything was to be governed by the laws of the market, many shanty-town residents were relocated in peripheral areas with no opportunity to appeal to the laws of the market in finding their new location. The most important factor that determined who or which family was moved was the social composition of the respective commune (ROJAS 1984, p 72.; HIDALGO 2004, p.230). Thus families living in predominantly poor municipalities were relocated to another part of the same municipal territory while families living near exclusive neighbourhoods in rich municipalities were moved to distant parts of the city.

The end result of this policy was the creation of large urban ghettos, especially in the very south and the very west of the city (Figure. 3, districts of La Pintana and Pudahuel). The “social cleansing” carried out by the military government nipped in the bud the symbiotic relationship between rich and poor. Many people who worked as gardeners or as domestic help could not keep their jobs because of the great distances and the poor connectivity involved. The physical distance also increased the social distance. People had “decent housing” in the words of the government, but they lost their “social capital”, to apply BOURDIEU’S terminology (1983, p. 191). Contact with rich sectors implied not only access to jobs, but also facilitated health benefits and educational chances. All that disappeared at a stroke. The new neighbourhoods in the far periphery of the city offered very small but solid houses, sewage systems and drinking water, yet those same neighbourhoods lacked a number of positive urban features like parks, schools, security services (police and fire-fighters), shops and, above all, sources of employment. Summarizing, it can be argued that although the subsidy allocation system was based on market oriented factors, the policy of relocation of families characterized a centralized system more typical for totalitarian governments.

### **3.3 Privatization and concessions of public works**

Where market oriented factors did operate without a counterweight was in the outsourcing of activities that were formally performed by state entities, like the Ministry of Public Works MOP (Ministerio de Obras Públicas). From the 1980s a growing number of services (such as bridge repairs and maintenance of major roads) were conducted by private companies. The economic success shown by the privatization process in the areas of health, pensions and education paved the way for more private participation in state activities. Along with the privatization and outsourcing of many functions, this took an intermediate form (concessions) by which the state maintained ownership of the property granting private consortia the operation of some activities. The first step towards the implementation of this new mechanism was the partial concession of some operative

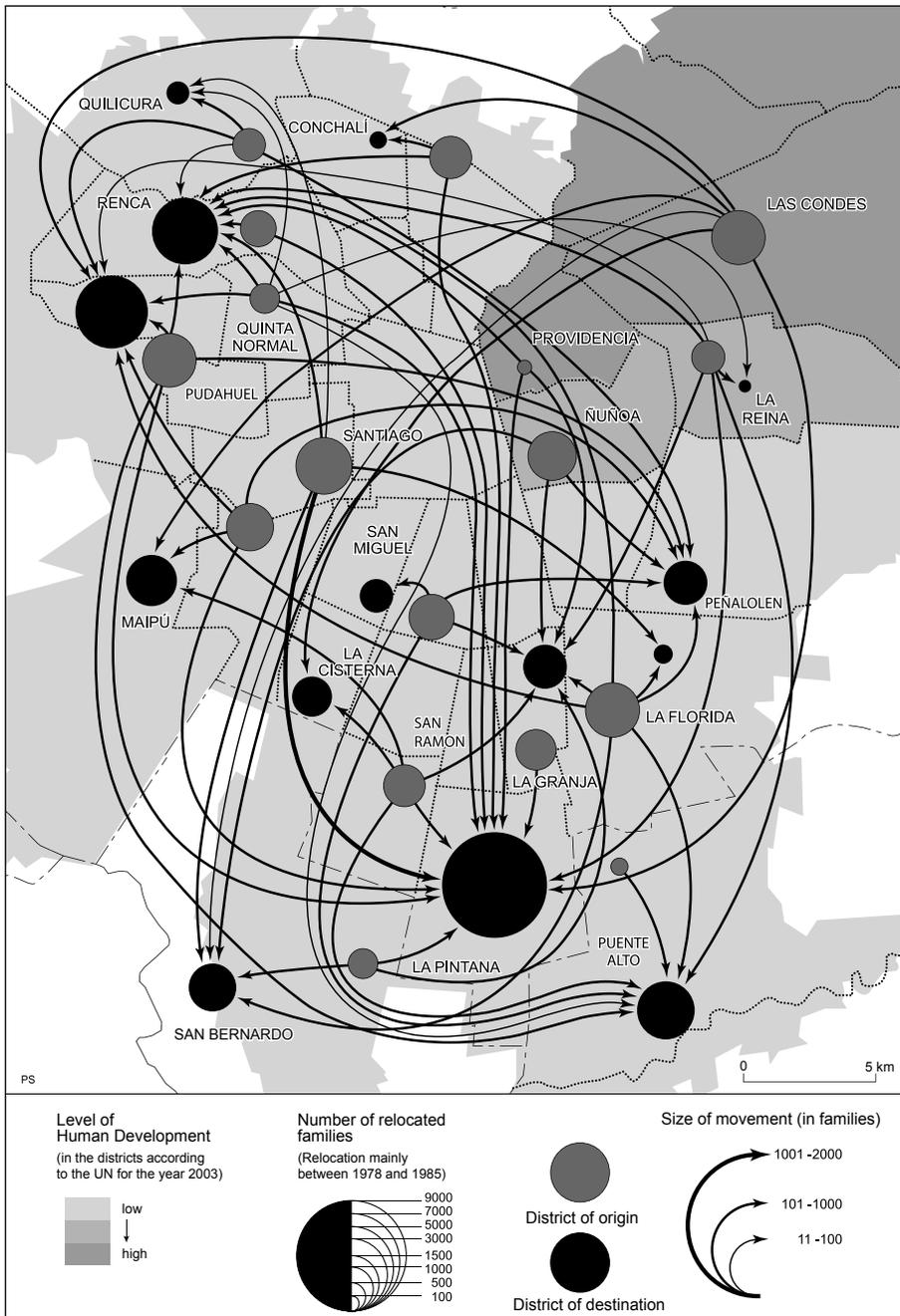


Figure 3: Long lasting effects of a resettlement policy

Source: GALLEGUILLOS 2007a, p. 111, modified and data from UN and Government of Chile (2003)

activities at the major ports of Chile. After the devastating earthquake of 1985, which destroyed the port facilities of San Antonio (the most important commercial port in the country), the authorities considered applying the same mechanism to rebuild and to run some activities at the port. The concession ensured that the reconstruction would cater for operational needs. After a few years the concession model showed great improvements, so the government decided to begin developing a comprehensive legal standard in order to apply the concession mechanism in all possible areas. The military government began with the foundation through a decree (decree N° 294 of 1985), but this was insufficient to address the complexity of concession mechanisms. The discussion and optimization of the regulatory mechanisms took several years and were finally condensed into a new law (*Ley de Concesiones y Reglamento de Concesiones de Obras Públicas*), the law and regulations governing public works concessions of 1996. The concession of ports was followed by the application of the same mechanism to the operation of airports and intercity highways.

## **4 The new urban concessioned motorways**

### **4.1 Technical justification**

The huge profits achieved by the concessioned intercity highways triggered in the late 1990s discussion about the concession of urban expressways with the aim of turning them into high standard motorways. The concessioned sections would be the corridors identified in the 1969 MOP master plan, that is, the ring expressway (Americo Vesputio), a north-south axis (central highway) and an east-west axis (Costanera Norte).

The promoters defended their project with two key ideas. On the one hand they referred to the concept of “social profitability”, which is the key concept of all major projects approved by the Ministry of Planning (MIDEPLAN), and on the other hand they alluded to the possibility of increasing the average speed of the road network in the city.<sup>7</sup> In the case of road infrastructure the Ministry of Planning applies the so-called VANS (valor actual neto social – present net social value), which is calculated by measuring the amount of fuel and tires used, taking into account the characteristics of the network. The more fuel and tires that can be saved, the greater the social return and hence the greater the technical justification for the project. All calculations pointed to the construction of the highway system achieving significant savings from the standpoint of the Planning Ministry. The other major argument is related to increasing the average velocity in Santiago, or at least halting its permanent decline. In an article published in 2006, a group of economists<sup>8</sup> emphasized that if the highways were not built the average speed would drop from 25.1

7 In addition to the criteria mentioned above, the reduction of fuel used would necessarily imply that there would be a parallel reduction in CO<sub>2</sub> and ozone emissions; given the levels of contamination, any measure that leads to lower pollution would be welcomed by the public.

8 These authors are known supporters of the neoliberal system and have relationships with the economic right through foundations such as the CEP (Centro de Estudios Públicos) and the “Andes University”, an entity funded by the Opus

km/h to 19 km/h (CABRERA et al. 2006, p. 416). But a study commissioned by the United Nation Development Programme and carried out in 2009 by the British consultant agency Steer Davies Gleave (Steer Davies Gleave 2009, pp. 95-125) showed that even with the new motorways, the average speed dropped anyway to 19 km/h after only three years of the new system.

## 4.2 Economic justification

While there is no official economic justification, each concession tender must be sufficiently attractive in order to engage the best suppliers in terms of quality of construction and project management during the operation phase. As a BOT type concession (Build-Operate-and-Transfer), the award process gives no importance to the final amount of work involved. The standard imposed by the public works ministry is high, so that the company must balance its investment in works with the operational costs. But ultimately these are tasks that would generate much cost to the state, so that the incentives are also high. The incentives are given through fee algorithms. Through these algorithms operators secure gains over time. Rate adjustments can greatly exceed the inflation rate.

## 5 The impact of the new motorways: two study cases

### 5.1 Introduction and methodology

Sondeo de precios en los p<sup>o</sup>rticos de estas rutas urbanas:

Hasta 174% suben en  
cinco años las tarifas de  
los tramos más usados en  
las autopistas de Santiago

Inflación, alzas adicionales por contratos e implementación de horas punta explican aumentos.

Tramo Vitacura-centro (Costanera Norte) es el más caro del sistema: \$853 entre 7:30-8:30 y 18:30-19:30.

INFOGRAFÍA CON LOS PRECIOS DE CADA TAG DE SANTIAGO I B10 y B11

Figure 4: Headline in *El Mercurio*: Up to 174% rates rise in the most used sections of highways during the last five years. Far more than the cumulative inflation over the same period, which touched 28%.

Source: *El Mercurio*, 18 Mar 2011

The opening of the first urban motorways in 2005 raised several questions about the impact of these new works on the urban structure and segregation patterns. From the beginning there were a number of “curious features” (which were the initial impetus for this research) that indicated that the impact would probably be considerable. The highway runs right through the urban tissue, in poor areas through high embankments, in affluent neighbourhoods underground or screened with green buffers to mitigate the motorways’ impact. The average ratio of entrances and exits between rich and poor sectors is 3 : 1. But none of these rather formal aspects necessarily explain the most profound changes in and impacts on the urban structure. Nor is it clear whether this type of construction automatically affects current segregation patterns. It was therefore very important to design an appropriate methodology to shed light on the impacts of such construction works on the city and its socio-spatial structure. This methodology should aim to elucidate the research question: To what extent do new urban motorways produce relevant changes in segregation patterns in Santiago de Chile? For this purpose a dual approach that combines different qualitative analysis tools was used in carefully chosen study areas.

The available quantitative information, mainly related to the demands of road capacity and flow of motor vehicles, did not explain deeper phenomena; it only showed the amount of journeys, origins and destinations, and the extent to which the road infrastructure was capable of coping with these demands. The impact on the people and on their behaviour towards the highway, as well as family decisions driven by the construction of the motorways, could only be elucidated using several qualitative methods, in line with the triangulation recommended by PUNCH (2005, p. 241). It was decided to use three successive methods:

- blank map method,
- foto self-elicitation,
- interviews.

The first method allows the development of a spatial awareness for the quarter under review, identifying places through different features with either positive or negative marks.



*Figure 5: The same motorway crosses two different urban areas; underground through the upper middle class quarter of Providencia (left), and across Pudahuel, a poor area*  
 Source: [www.costaneranorte.cl](http://www.costaneranorte.cl) (left); Photo by Oroz (right)

The second method (CLARK-IBAÑEZ 2007, pp. 167-196) deepens awareness of the neighbourhood using actual tours and taking pictures of relevant places. The participants use disposable cameras to record the places and routes. The third method is intended to achieve a global view and compare the two previous methods.

While the original plan for the motorways envisaged six different concessions, the construction of these original projects was not simultaneous. A simple array, but with very specific variables, was used to determine the most appropriate case study. Acceso Sur seemed to be the most interesting example (Table 1).

The start of the research coincided with the outbreak of the conflict over the project “Acceso Sur” in the south of the capital city. This allowed us to define an area in which social actors were coordinating actions to deal with state agencies, like MINVU (Ministerio de Vivienda y Urbanismo Ministry for Social Housing and Urban Planning) and MOP and with the concessionaire “Autopista del Maipo”. Therefore, the effort was focused on finding a representative section with clear recognizable boundaries within the area affected by this new highway. Finally the quarter “Santo Tomás” was selected; this quarter is clearly defined by its boundaries with wide avenues. Moreover, the people of this area immediately demonstrated that they were receptive to giving their view of the problem.

The project had always been intended to contrast two different realities. The idea was thus to find a sector that was heavily fed by the highways and that could demonstrate the profound changes that have occurred in the development of the city. The idea of using the case of the Chacabuco area suggested itself at the very beginning. The Chacabuco Province is nowadays the most natural expansion area for Santiago (especially for the upper

Table 1: Factors for selection of case studies

Factor	Motorway					
	Costanera Norte	Vespucio Norte	Vespucio Sur	Vespucio Oriente	Autopista Central	Acceso Sur
<b>Construction phase</b>	96%*	93%	93%	0%	90%	7%
<b>Citizen participation</b>	M	L	L	U	L	H
<b>Social explosiveness</b>	H	M	L	U	L	H
<b>Effect on surroundings</b>	H	H	L	L	L	M
<b>Effect on urban fabric</b>	M	L	L	U	L	H

\* Percentage reflects the progress of construction (data: MOP)  
 Factors: H (high), M (medium), L (low), U (unknown)

Source: MOP 2006/2007; own survey

middle class). Chacabuco is located immediately north of the city and separated from it by a medium-altitude mountain range. In this area there has been an explosive increase in housing developments for the upper middle classes, especially for professional young couples. On the other hand, Chacabuco was not a sector that was being directly impacted by the new motorways. In this sense the choice of this area as a case study departs from the spirit that inspires the research. However, by 2006 the explosive economic success achieved by the Costanera Norte highway, which feeds the traditional upper class up-town in the very east of the city, caused both real estate and motorway operators to bring pressure to bear on the authorities in order to accelerate the bidding for new works that would feed the Chacabuco area. These motorways were not considered in the original plan presented at the end of the past century. Currently the Chacabuco area is fed by three different motorways: Carretera San Martín, Costanera Norte and Radial Nor-Oriente. The latter involved an investment of 270 million US dollars and required the construction of three tunnels through the northern mountain range (Gerdau Aza 2008, p. 2). Thus the situation changed between 2007 and 2008 and the inclusion of the Chacabuco area in the investigation was fully justified. It was necessary to choose one of the mega-developments in Chacabuco, examples of “walled cities” in the words of BORSORF and HIDALGO (2004, p. 111). This task was somewhat paradoxical because it was not possible to apply variables to choose the most relevant example; it was necessary to simply select the one that could be described most fully. Upper middle and upper class groups are not likely to give any information to strangers, even in the interests of scientific research, so the focus was put on one complex where more people might be willing to give information. The chosen project was the development named “La Reserva”. The website description of the project is a remarkable summary of its characteristics:

“A unique project, with a remarkable development that provides residents of La Reserva not only with landscapes, views and an environment of great beauty, but also with a sense of extreme comfort. In addition La Reserva has better access and better connections to and from Santiago.” ([www.lareserva.cl](http://www.lareserva.cl))

Because of time constraints and possible results as well as the lack of critical mass, in the case of La Reserva the research was carried out using the method of in-depth interviews. This limitation was one of the variables recognized at the beginning of the investigation, but because of the quality of the interviews the case study was considered absolutely valid.

## 5.2 Research development

Having defined the study areas, we proceeded to contact the neighbourhood’s leaders, especially in the case of the “Santo Tomás” area. With their support a pretty big list of potential participants for the various workshops and interviews could be drawn up. Talking

first with the neighbourhood leaders, who had the full confidence of the residents, allowed the process to be accelerated and helped determine a schedule of activities related to the research. In the case of Santo Tomás, an average of 12 people participated in each of the four workshops designed for on-site data collection.

In the first activity, which was more guided, the participants tried to identify different parts of the quarter by using adjectives (good, bad, dangerous, nice, friendly); their records were then transferred to a sheet of paper and the locations were fixed by circumscribing the areas on a blank map. The analysis used three scales (the quarter, the municipal area and the city as a whole), using different sets of blank maps. This activity was very strenuous and lasted over three hours, but allowed the four groups of participants to demonstrate a clear awareness of the spatial configuration of their environment.

Between each workshop data were analyzed in a preliminary way. Analogous to the first workshop, in the activity devoted to the explanation of the photo tours four groups were formed. Each group should define a clear theme to give a coherent account about the neighbourhood in which they live. Public space, quality of space in general, environmen-



*Figure 6: One group identifying locations and routes within the Santo Tomás area in the commune of La Pintana*

*Source: Photo by Oroz*

tal problems, the neighbourhood and children, crime and public safety, public transport and connectivity with the rest of the city, and the effects on the quarter of the construction of the motorway. The fact that groups were formed to follow a path – we may call it a thematic path – was a reflection of the decision that each route could be defined and maintained by the group members. The groups were given one week to complete their routes. At the end of the week the cameras were collected to develop the negatives. A new meeting was set up for a final workshop to analyze the photos carefully. Each group would be confronted with their “product” and would write down on paper their thoughts and impressions about each route. All activities were closed by a final discussion panel.

For the analysis of the situation in “La Reserva”, as mentioned above, it was very difficult to engage participants in more complex activities, such as the work with blank maps or the photo self-elicitation activities. To perform these activities requires an active community with strong ties among its members. In the case of these housing developments, residents are quite isolated from each other, have recently moved to the area and hardly know each other. In this project we were able to contact people individually. Many did not agree to be photographed or recorded, but who were open to an interview when the interviewer



*Figure 7: Family Cárdenas Stuardo at home in La Reserva. This young couple agreed to give much information about their decision to switch to a new neighbourhood*

*Source: Photo by Oroz*

wrote down their answers to the questions; in other cases there was a telephone interview essentially because of claims of lack of time for a face to face interview. Only in one case was it possible to contextualise the interview. One couple of young professionals were willing to speak without any restriction about their decision to move to the new development and about all that it implies for their change of life.

### **5.3 Results**

At the end of each of the workshops and each interview, the principal issues were scored. This record served as a preliminary framework for evaluating the material collected on site. The evaluation of the written record and the recordings – still not completed – has taken several months due to their volume. In general we see that the construction of new highways has indeed had an unexpected impact in both the areas that they traverse and in how the city expands. In the case of residential quarters, especially in areas where no mitigation measures have been taken, the highway has multidimensional effects. Some of these effects are interrelated and were more or less expected when the study began. However many of the indirect effects of highway construction were not foreseeable at the time of initiating the investigation. The effects of these projects were diverse, depending on the phase of construction progress.

#### **5.3.1 Pre-construction stage**

This phase was important only for those cases where construction work directly affected an adjacent residential area, such as the “Santo Tomás” quarter. The effects were mainly at the level of social cohesion. Since it is not mandatory to carry out public participation processes, people learnt about the project through informal paths of communication, which produced a high degree of uncertainty and misinformation, and finally created a feeling of vulnerability vis-à-vis the government and concessionaire counterparts (MIN-VU, MOP and the concessionaire). Another factor that further exacerbated the situation was that once the approval of the project was known in the community, the project was not reported to the community, but only to a few people. This tactic was widely rejected by the community, which condemned it as a “divide and rule” policy. For sectors that are fed by motorways but are not directly impacted by their construction, no relevant effects were observed at this stage of project development.

#### **5.3.2 Stage of construction**

For those construction projects located immediately adjacent to densely populated areas, the construction process was surrounded by controversy from the beginning. In the case of the “Santo Tomás” quarter, barely four feet and a thin wooden fence separated the houses from the construction activities. The impacts observed during the construction pe-

riod can be divided into four areas: connectivity, environment / health, economy and social area. With regard to connectivity, the whole “Santo Tomás” quarter suffered a decline in connectivity both internally and with the rest of the city. The street under which the highway was built was closed to traffic. The streets serving the internal communication of the neighbourhood were destroyed by the weight of cement mixer trucks, since they were designed to carry only light vehicles; trucks also often obstructed narrow streets and passages, sometimes causing serious disruption at the time of a medical emergency or during a fire in the quarter. Regarding the health and environmental problems raised we can mention that parallel to the construction activities small landfills began to emerge. There was also clandestine burning of bituminous material. These two aspects are closely related to the lack of control exercised by the municipality. These clandestine activities are attributable to the construction company and were in addition to permitted impacts such as construction noise. At a more subtle level, the investigation revealed that there was a very significant increase in nervous diseases as a product of both the direct impacts of the construction activities and of the uncertainty generated by the lack of transparency of the negotiation policies. This situation was compounded by citizen resistance to the construction work, which was manifested through demonstrations and the burning of shovels and machines at night. This represented an unprecedented case in the short history of urban motorways in Santiago. One of the most impacted issues was internal social cohesion. The government agencies negotiated separately with different groups of residents, some of whom achieved very good terms of compensation. Many received amounts well above the market value, but others were not even considered for any compensation. The inequality of the negotiators’ actions produced divisions, grudges and feuds between groups and among neighbourhood representatives. But the most important division created was that between the community as a whole and the government, as the adequately compensated neighbours left the quarter. Those who for one reason or another remained were labelled as conflictive, even as criminals.

From the economic point of view, the value of both plots of land and buildings suffered some deterioration because of the construction activities. This decline was not very significant as the area was already heavily depleted in value. A significant deterioration in the economic capacity of the residents was produced by the worsened connectivity, which led to the necessity of making longer and more expensive trips. Moreover, the impact of future projects or the construction of new motorways in the northern area of Santiago was at an enterprise level rather than at the level of individual decisions. Projects under construction speeded up some real estate investments, but did not produce an influx of families to this area.

### **5.3.3 Completed projects**

Many of the problems described for the construction phase remained unchanged after conclusion of the building work. Despite the many announcements by the authority that the problems arising from the construction of the highway would be solved, virtually no effective mitigation was implemented. Thus housing blocks immediately adjacent to construction were demolished under the promise to build a park for the community, but today, almost a year and a half after the motorway was officially opened to traffic, in the devastated area there is only a large dump. These broken promises moved the neighbours to sue the state for approximately three million Euros. (El Mercurio 24 April 2011).

But there are also a number of problems that did not exist before the construction of the motorway, problems that are attributable to what might be called the “membrane effect” of the motorway. The motorway has become a sort of one-way membrane that allows unwanted effects or menaces to pass. The clearest example of this is the explosion in drug trafficking in the quarter. Drug cartels use the highway to access the market – the quarter – quickly from other parts of the city, likewise the motorway gives them an excellent way to quickly escape from a police check.

Since the motorway is not intended to serve the quarter in terms of improving connectivity, due to the high cost of using it, this piece of infrastructure has become a barrier for the neighbourhood. But, as mentioned above, impacts in neighbourhoods such as the study area are multidimensional and not limited to pedestrian or vehicular connectivity. In a summary table at the end of this section the effects on the various dimensions of neighbourhood life are noted.

In the case of housing projects north of the city, the operation of motorways consolidated the trend of exodus of many upper middle class families. For those who already lived in suburban developments, the construction of these roads also involved important changes. For this group the changes were rather positive: the value of their land and homes has increased significantly and travel times to administrative and service centres decreased significantly. Another point to note is that the construction of highways to the north attracted a number of educational, health and trade services, which has resulted in the greater independence of the Chacabuco sector from former centres of the metropolis.

But the most recognizable impact was the impetus provided to make the decision to abandon traditional centres and to buy a property in the well-equipped suburbs. The spatial distance has no importance when the time gap is affordable. Additionally, families who decide to move – if they have sufficient means or see this as a business opportunity in the long-term – access higher safety standards through the gated communities.

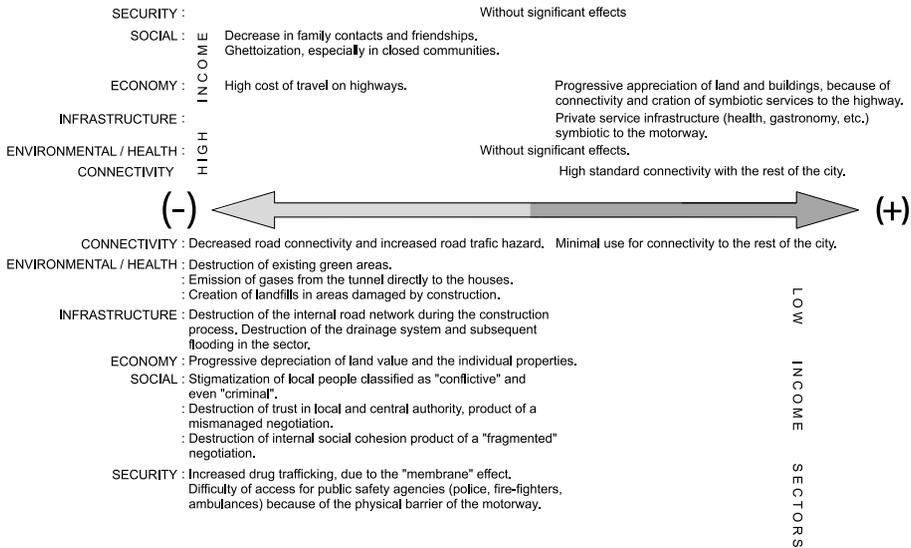


Figure 8: Table summarizing impacts in high-income areas, at the bottom the impacts on low-income areas

Source: Own survey

## 6 Conclusions

The urban motorway concession proved to be excellent business; it is not for nothing that after a few years of operation the state called for tenders for new projects originally not considered in the motorway plan. However, the impact of the urban motorways has been enormous, though certainly not in terms of the original targets. The decrease in average traffic speed has not been stopped, but the rate of change in the city structure has received a huge boost. Moreover, the implementation of the urban motorway network involved the creation of two coexisting road networks. One old, poor quality and extremely congested road network that is free to use, and one high standard road network with exorbitant charges designed primarily for high-income users.

It may also be noted that the impacts of the highways have been mainly in two dimensions: on a micro-scale and on a metropolitan dimension. Micro-level impacts are related to the neighbourhoods or quarters that have been directly affected by the construction of a new highway. In these cases, in poor areas neither the concessionaire nor the authorities have invested in adequate mitigation measures. The process, which was very mismanaged by the authorities, resulted in a serious deterioration in the quality of life for residents, also reducing the self-esteem of the people who see themselves as victims of an unjust system. Further this has deepened a widespread feeling of exclusion, which is the most extreme and negative stage of urban segregation. The construction of a piece

of infrastructure in front of their houses, something they do not use and that has caused and continues to cause a host of problems, is an open wound for the community and for this area of the city. The impact caused in other sectors of the city is very different. Those new neighbourhoods that are fed by these infrastructure projects but that do not have to deal with negative externalities, profit from efficient connectivity and an increase in goodwill. But in this case the projects also underpin exclusion phenomena. It is a different type of exclusion, a voluntary exclusion, but it also erodes social cohesion as a whole and precludes contact between different social classes. Since Santiago is an extremely polarized city from the perspective of the socio-spatial distribution of its inhabitants, the balance of the impacts of these new works of urban connectivity is far from positive. It is worrisome that the authorities – especially those connected to ministries with planning responsibilities – are not able to detect the number of deficiencies that the current model of urban motorways have. The many problems have only been covered very sporadically in the press and have not caused the model to be contested, as this research suggests is necessary. Indeed the model has been praised in other countries of Latin America and is intended to be extended to other major Chilean cities. It should, however, be subjected to profound changes to ensure that urban motorways in the future are not limited to being just what they are today: good business.

Perhaps the most important conclusion of the present study is whether these construction works have changed the existing patterns of segregation or not. And there is indeed a major change, but it does not affect all social strata equally. In the case of the lower classes urban motorways have an “amplifying effect”, exacerbating segregation phenomena and even producing the clear exclusion of some groups (Figure 9).

In the case of the upper classes there has been an abandonment of the traditional model of expansion. The expansion cone from the traditional centre has disintegrated and the

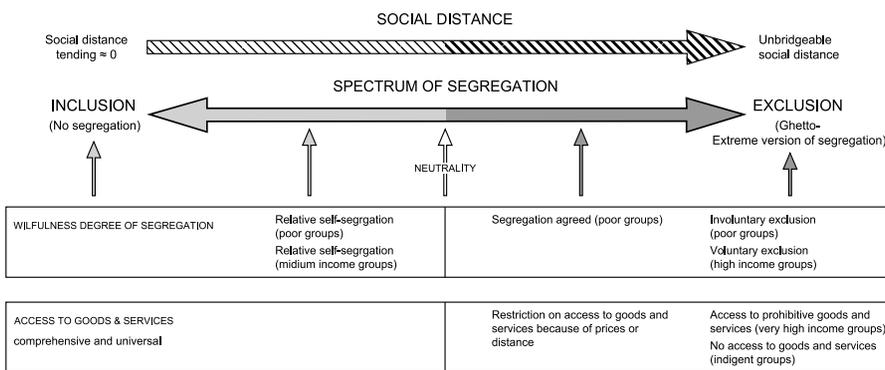


Figure 9: Spectrum of segregation and social distance  
Source: Design by G. Oroz

location of new upper class settlements is not characterized by fragmentation as suggested by BORSODORF (2003, pp. 37-49), but is associated with ancient consolidated towns or settlements in the far periphery of the city (Figure10).

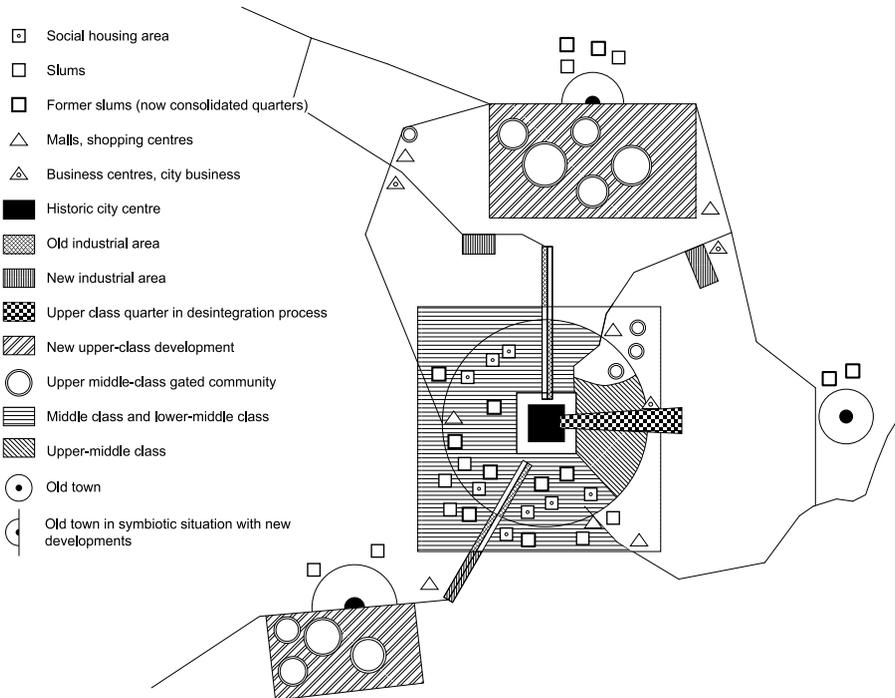


Figure 10: New development stage of the Latin American city: The symbiotal peri-urban settlement

Source: Design by G. Oroz

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