Living on the edge:
Social and environmental exclusion in the periphery of São Paulo, Brazil
Vivendo no limite: Exclusão social e ambiental na periferia de São Paulo, Brasil

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Sumário: Brasil é famoso pela exuberante affluência ao lado da pobreza aguda. A maioria dos programas governamentais direcionados a esta questão tem falhado em erradicar em grande escala estas desigualdades. A contínua expansão de assentamentos irregulars de populacões sem ou com baixa renda é um exemplo visível desta situação. Durante séculos a desvantagem e a exploração sócio-econômica enraizados historicamente têm reiterado as condições neo-patrimoniais resultados do período colonial. Políticas públicas e a insuficiência de recursos humanos e financeiros explicam a baixa qualidade ambiental encontrada na periferia urbana das metropoles brasileiras. O presente artigo discute os resultados de uma pesquisa conduzido na periferia de São Paulo, onde a população excluida ocupou illegalmente os mananciais da represa Billings. Nas cidades o meio ambiente também sofre das consequências da exclusão. Durante décadas esta área de proteção aos mananciais recebeu parte do esgoto doméstico e industrial de São Paulo. O artigo debate a questão dos impactos decorrentes da exclusão social e ambiental no caso da ocupação *Pedra sobre Pedra* nos mananciais da represa Billings. Finalmente, novas direções nas políticas públicas para as questões sociais e ambientais serão revisadas.
Palavras chave: Exclusão, impacto socio-ambiental, ocupação illegal, mapeamento comunitário, São Paulo.

Abstract: Brazil is known for its exuberant affluence next to acute poverty. Most of the government programs that have tackled the issue in the past have failed to eradicate this condition on a broad scale. Widespread no- and low-income neighbourhoods in metropolitan peripheries are a visual example for this. Over centuries historically rooted disadvantage and exploitation have reiterated neopatrimonial conditions. Public policies, and insufficient financial and human resources also explain the low liveability and environmental quality in the urban fringe. The paper discusses findings of a rapid appraisal and community-mapping conducted in the outskirts of São Paulo where socially and economically excluded dwellers have occupied the margins of lake Billings a drinking water catchment in the south of the city. In urban peripheries the environment also suffers the consequences of exclusion. Over decades the supposedly protected Billings watershed received untreated sewage, industrial waste and everything unwanted in prime locations. I will discuss the widespread impacts from social and environmental exclusion, with the example of the squatter settlement *Pedra sobre Pedra* located in this watershed. New directions in public policy that address social and environmental exclusion are reviewed.
Keywords: Exclusion, socio-environmental impact, squatter settlement, community mapping, São Paulo.

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1. INTRODUCTION: SOCIO-ENVIRONMENTAL CRISIS IN URBAN PERIPHERIES

Accelerated urban growth has been a dominant trend over the past few decades, particularly in South America, where now more than 78% of the population lives in cities, compared to 40% in Africa and 40% in Asia (UNPOP, 2005). Brazil is one of the most urbanized countries in Latin America with approximately 81% urban population (IBGE, 2005). With the rapid rural-urban population shift since the 1970s, poverty is becoming a critical urban problem. The *UN-Habitat Report* estimates that in 2001 32% of the world's total urban population, or nearly 924 million people, were living in slums. Approximately 43% of the urban population in 'Developing Regions' and 78% in 'Least Developed countries' live in slums (UN-HABITAT, 2003).

Photo 1: Urban low-income periphery in the south of São Paulo with inactive landfill *Itatinga* (Photography by Jutta Gutberlet)

One of the most populous regions in the world is the Greater Metropolitan Area of São Paulo with approximately 20.5 million inhabitants in 39 municipalities covering an area of 8,051 km^2 (IBGE, 2005; EMPLASA/Ministério da Saúde, 2002). The city of São Paulo is the largest within this agglomeration. It is well known for its skyrocketing population growth from 580,000 inhabitants in the 1920s, to almost 1 million in 1930 and 10 million in 2000. In 2005 there were 10.9 million people occupying an area of 1,523 km^2. The current growth rate is 0.4% per year (IBGE, 2005). Dramatic urban change has happened at the fringe over the past two decades, as a result of intra-urban migration, particularly from the Northeast and resettlement following removal of poor neighbourhoods in inner-city areas (Prefeitura do Município de São Paulo, 2000:14 and 95). Although, the overall annual population growth rate in the city of São Paulo, has diminished from 4% in 1991 to 1.7%, the city is still growing very fast at the fringe with over 6% annual increase since the early 1990s. Nowadays, 30% of the city's population lives in marginal settlements at the periphery (Torres, Alves and Oliveira, 2005:1). A significant proportion of these settlements are illegal; in fact *43% of the population living in peri-urban areas* [according to Torres et al. urban areas with continuous high population increase] *of the city of São Paulo* (Torres, Alves and Oliveira, 2005:16).

Urban sprawl without planning and infrastructure expansion -as witnessed in most of the periphery in São Paulo induces severe social and environmental problems (Photo 1). The

term squatter settlement refers to "*uncontrolled, low-income residential areas with ambiguous legal status regarding land occupation… [and the] usual image of a squatter settlement is of a poor, underserviced, overcrowded and dilapidated settlement*" (HABITAT, 1982:15). These are spaces where access to drinking water, sewage, waste collection, and other basic public services are mostly improvised; where green and cultural spaces are rare or inexistent and where housing is risk prone. If not lacking, the services and infrastructure provided are often in such precarious condition in these neighbourhoods that public and environmental health are at stake. Significant changes in the cultural pattern of land occupation have taken place since the 1970s with the rapid and unplanned urban sprawl in the metropolitan region of São Paulo. Nowadays most of the rich outside of the central high-income neighbourhoods live in gated communities (*condominio fechado*), such as *Alphaville*, at the margin of the city. These highly protected spaces are usually well connected to the city centre through highways away from the spaces of the poor, avoiding the cultural clash between extremely rich and poor.

I will discuss results from research initiated in 1999 in a squatter settlement in the south of the municipality of São Paulo. I conducted a rapid assessment and participatory mapping of physical indicators for neighbourhood liveability, adopting action research methodology. Social action research is an interactive learning process. This approach permits increased visibility of the concerns of the researched community and it rapidly transmits the generated knowledge to the locals. The process further helps empower the local community. According to Simon "empowerment is "the power of human beings to alter the material world and transform the conditions of their own actions" (2003:5).

I will examine some of the possible root causes for the situation of lifelong exclusion of the people living in marginal settlements. I will further point to the fact that peripheral spaces are also subject of exclusion and lack legal protection and efficient strategies to maintain environmental health. The results underline the disparate distribution of infrastructure, public services, and opportunities for human development, resulting in thousands of socially excluded people and excluded spaces in the periphery. The research will also highlights some challenges encountered in participatory research. A focus on inclusive strategies for community development is essential to successfully tackle some of the social and environmental problems highlighted in the article.

2. SOCIAL EXCLUSION IN THE SOUTH

In this paper I depart from an integrated research approach on liveability and sustainability in terms of local or community development. This methodological choice provides the opportunity to address problems that arise from fragmented, technocratic management and from disintegrated governance. The fragmented nature of governance structures with multiple institutional levels is frequently a hindrance for efficient and economic resource management. Lack of communication between agencies, excessively complex structures, overly extensive bureaucratic procedures, prone to rivalry, corruption and inefficiencies are often major institutional barriers to implementing a holistic method. For a paradigm shift to happen requires a change in mentality of the involved agent, which can be more easily provoked by visual images than by written documents. The inspiration for this research derives from participatory and community-driven work that focuses on bottom-up local development (Boonyabancha, 2005; Sakai, 2002).

The concept of social exclusion (Room, 1995) defines a state of detachment, where individuals are restrained from or not enabled to access public services, goods, activities, or

resources, which are essential for a life with dignity. It is seen as a state of ill-being that takes power away and somehow disables people from being full citizens, isolating them from the rest of society (ILO, 1996:12). Social exclusion provides a useful theoretical framework to analyse the factors and processes involved in the marginalization of urban population in developing countries. It places a central concern on dominant institutions and rules that enable or restrict social interaction. The stigmatization of certain groups as being 'underclass' who are worthless or worth less is another aspect that reiterates social exclusion and provides excuses for not doing enough to achieve greater equality (Gans, 1996:143-145). Social and economic exclusion is sometimes also referred to as marginalization (Braham and Janes, 2002:253). Strong prejudices related to race, education, and income, against people from marginal settlements leads to their qualification as lower social status. Women are a particular vulnerable group that is frequently marginalized. Gender related prejudices often force them into disadvantaged employment patterns and restrictive social roles (Bandarage, 1997). However, marginalized children and young people are affected most since they are deprived of future opportunities. Not being able to access a regular, healthy diet and primary/secondary education, or professional training, they usually become unemployed or underemployed and end up in the informal sector.

Changes in the international division of labour, increased precariousness with labour shifting into regions and countries with the most exploited working conditions, have affected employment around the globe (Lavinas and Nabuco, 1995; Bromley, 1997). There is growing awareness of the negative social consequences (for example increase in crime and violence) of joblessness, long-term unemployment, and the massification of underemployment. Salary rates for unskilled labour and workers in the informal sector are usually far below the subsistence level and often do not meet the livelihood requirements.

Economic recession and structural adjustment programs directly impact on public spending and affects the public health, education, and housing sectors most, reinforcing some of the already existing disparities and disadvantages (Bello, 1993:201-204; Drakakis-Smith, 1996:692). Institutionalized corruption, political clientelism, and short-term measures of populist political nature are also often responsible for chronic and widespread social and economic inequalities and growing regional disparities. On the other hand continuous socio-economic circumstances further reinforce the inability of the excluded to overcome this state. *"Material deprivations experienced by the poor are socially constructed at every node of the nexus of production relations".* Referring back to the concept of social exclusion, I reiterate the necessity to challenge existing social structures in order to address these problems (Yapa, 1998:95).

Poverty and socio-economic marginalization are the most prominent characteristics of social exclusion in countries considered 'developing' (Auyero, 1999; Daniere and Takahashi, 1999; Douglass, 1998; Figueroa *et al.*, 1996; ILO, 1996). Here the situation is overwhelming due to the extent and degree of this phenomenon. In Brazil, social exclusion has been tied to its economic development since the colonial period. Today, there are new forms of exclusion with increasing numbers of people living in precarious housing, becoming long-term unemployed, being unable to enter digital literacy and being power- and moneyless. In the specific case of São Paulo, the data reveals that today exclusion affects more elderly people, more children, and more white people with a non-migrant background (Prefeitura do Município de São Paulo, 2002b). Social exclusion is widely recognized in the literature and has also entered policy levels, with governments often creating specific agencies and programs to combat social exclusion. The previous municipal government of São Paulo, for example, has mapped the extension and degree of exclusion (Ibid.).

The definition of poverty has changed over the past decade, from a traditional income oriented economic approach (for many years promoted by the World Bank) to one that is

multi-faceted and focuses on distributive issues, such as access to adequate health care, education, nutrition, etc. (Satterthwaite, 2001), and more recently towards an extended framework that includes dimensions of vulnerability and powerlessness (Hjorth, 2003:383). With the development of the sustainable livelihood concept, linkages between poverty and the environment have become more widely acknowledged (DFID *et al.*, 2002; Mitlin, 2003; Rakodi and Lloyd-Jones, 2002). The theory contributes to the understanding of how livelihoods are produced and transformed under particular circumstances. Various levels of analysis are touched in this approach, engaging wider questions of political economy. It links the activities that people perform on a household level to sustain their livelihood, to a broader, international scale (Bury, 2004).

Poverty and social exclusion also cause environmental degradation. Illegal occupation, deforestation, inadequate resource management, irregular sewage and domestic waste disposal in the urban periphery are visible results of social and environmental exclusion. Marginalized people become actors that generate environmental impacts, which often inflict large-scale and long-term influences on public and environmental health. Being socially excluded also means greater vulnerability towards environmental risks. Being more defenceless due to the lack of resources, information, and formal education; this population is also more exposed to disease vectors and hazards. In São Paulo, the correlation between the location of low-income neighbourhoods and environmental hazards, such as waste dumps, polluting industries, and contaminated streams, provide evidence for environmental injustice. Urban peripheries are usually treated as excluded spaces, where environmental legislation and regulations to control land use, deforestation, and the discharge of contaminants are less enforced or ignored.

The concentration of environmental hazards such as garbage dumps and irregular toxic waste deposits is particularly high in the periphery. These are also the spaces where the poor and most vulnerable sectors of the population live. In many parts of the world, Non-Governmental Organizations, particularly under the banner of the 'environmental justice movement', have documented and contested the unequal, and often racist, distribution of noxious facilities, such as toxic waste landfills in the vicinity of low-income ethnic communities (Bullard and Johnson, 2000; Bullard, 1990a, 1990b; Bullard and Wright, 1990, Bryant and Mohai, 1992; Heiman, 1996; Pulido, 1996).

The concept of justice is reflected in the analysis of urban spatial patterns since the 1960s, focusing on variations in the spatial distribution of goods and services (Kirby and Pinch, 1983). In other words, distributive justice is about how fairly the cake is divided among its members (CSJ, 1998). In the past, a utilitarian approach to measuring the distributional outcomes gave rise to the notion of 'territorial justice', as a measure of fairness in the distribution of accessible public services (Davies, 1968) and in addition related to the proximity to undesirable land uses (Dicken and Lloyd, 1981). Important debates on fairness with respect to the distribution of environmental quality and risks emerged in the USA during the 1980s. Low and Gleeson point out that *the distributions, which are highly variegated in socio-cultural and spatial terms, interact to produce a diverse and shifting landscape of ecological politics* (2001:104). Plotkin (1987) and Reynolds and Honey (1978) documented some years ago that institutional mechanisms, such as planning regulations, keep noxious land uses away from high-income neighbourhoods and concentrate them in poor and working-class communities. This is more so an issue in countries with wide income disparities.

3. URBAN SUSTAINABILITY AND LIVEABILITY

Sustainability is defined as '*long term cultural, economic and environmental health and vitality*' (City of Seattle, 1993:2). It refers to requirements, demands, and obligations towards future generations and it underlines the responsibility to improve the quality of life of currently deprived and excluded populations. Exclusion is unsustainable, since it generates environmental and social impacts and costs. The loss of social capital due to crime or violence and the loss of environmental capital due to pollution and degradation are often the consequences of exclusion. Social capital has been defined as *"the relational structures (horizontal and vertical) that facilitate action and as the elements of civil society that have fostered economic development and good governance"* (based on the ideas of Robert Putnam and James Coleman in: Bury, 2004:79). Exclusion therefore jeopardizes social but also environmental capital.

Liveability expresses the quality of life for a population in a certain space. It is clearly about equity and refers to entitlements and the goods and services every person should be able to access equally, based on democratic institutions and legislation. It is a multifarious concept, based on objective as well as subjective indicators (Kemp *et al.*, 1997). Amin and Thrift (2002:140) propose a transformation towards *radical democracy*, where *"democracy requires the democratization of institutions and the empowerment of subaltern voices in a politics of vigorous but fair contest between diverse interests"*. Sen (1992) focuses on the existing connection between livelihood and citizenship rights. He explains how in different circumstances, individuals become excluded from what are considered basic public goods and services and from basic consumption.

Researchers, communities, and governments have applied a wide range of indicators to evaluate the long-term quality of urban environments and communities (Huang *et al.,* 1998, Maclaren, 1996, Mitchell *et al.,* 1995; City of Seattle, 1993). The *Local Agenda 21* is one of the milestones to translate these results into actions and strategies to improve the quality of life (Gutberlet and Vaz Guimarães, 2002; ICLEI, 1999; Parker, 1995). In this research project my focus is on risks and hazards related to the lack of basic infrastructure and public services affecting the liveability. I have conducted this research together with representatives from the local community and the results in part also reflect their perception.

3.1 Social and environmental exclusion at the urban fringe in São Paulo

Social and environmental exclusion are visible at the urban fringe in the metropolitan area of São Paulo. Despite the wealth generated in this area (16.7% or US$ 99,1 billion of Brazil's total GDP in 2000), there is a sharp contrast between spaces for the better off and spaces for the excluded (EMPLASA/Ministério da Saúde, 2002). Fix (1996) has analysed government funded, luxurious urban development in privileged areas in contrast with deprivation in the periphery. Data from the 2000 census indicate that 10.2 % of the population in the municipality of São Paulo are living under precarious conditions, with 870,000 people living in slums (*favelas*), 182,000 in multi-family housing (*cortiços*), and 8,704 homeless living in the streets (IBGE, 2005). The number of children living in the streets is on the rise. 1.25% of children below age 6 and 4.6% between ages 7 and 17 are living in the streets of São Paulo (Prefeitura do Município de São Paulo, 2000:61). Often these children become involved in drug trafficking, drug consumption and crime.

Squatting has increased particularly in the south of the city, next to two drinking water catchments: Lake *Billings* and Lake *Guarapiranga* (Map 1) as a consequence of economic recession, unemployment, growing living expenditures, and the demand for cheap housing since the *Plano Collor* between 1990 and 1992. Middle- and low-income people were hardest hit by the rise in rental property and the restrictions to access savings. In large cities, people rushed towards the fringe to buy or occupy land and to improvise a dwelling, avoiding highly

inflated rental costs in the central city (Taschner, 1995). The incapacity to enforce watershed protection law was a further driving force for urban sprawl into the periphery.
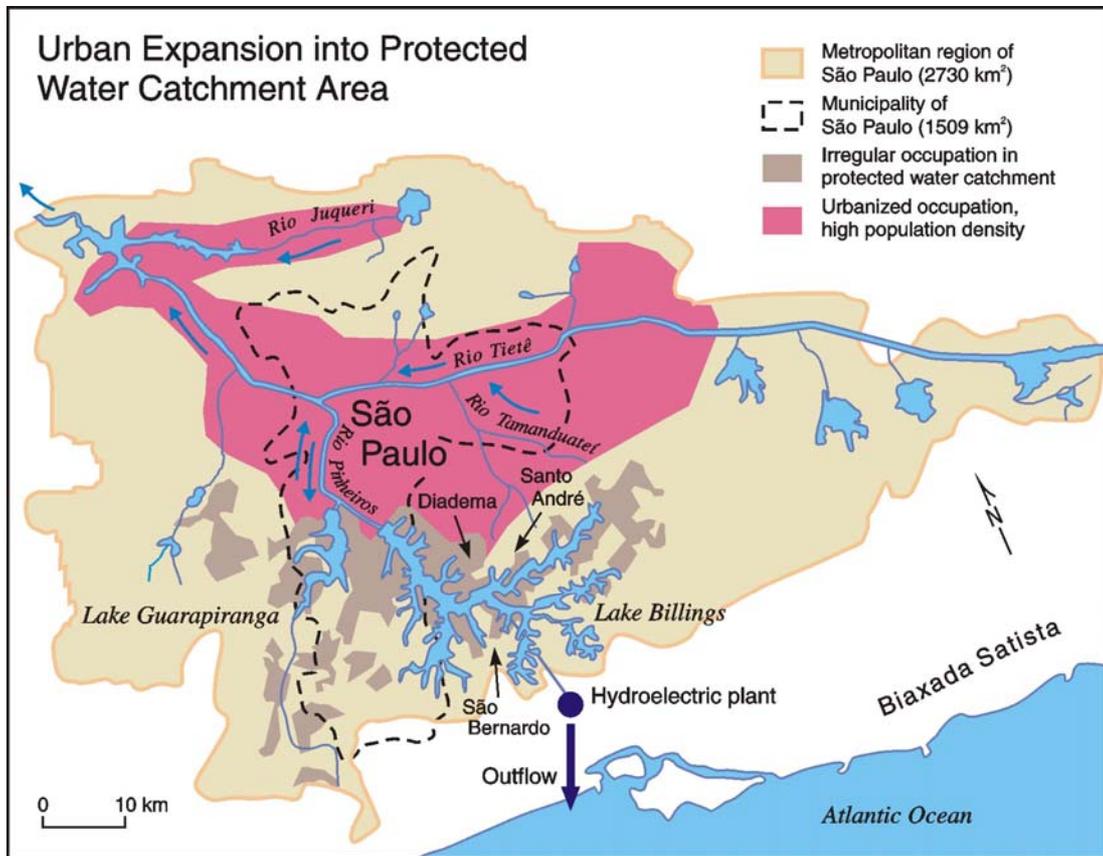
Map 1: Urban expansion of irregular occupation into protected water catchments.

For decades, the *Billings* catchment has receive the sewage and wastewater from the rivers *Tietê* and *Pinheiros*. Garbage is being washed into the lake from the drainage and streams. The specific environmental protection legislation from 1975/76 (state law no. 898/75 and 1.172/76) was never implemented. Hence, the government's inability to enforce the law, as well as lack of integration of public agencies and their policies (e.g., public housing, transportation), were key factors in tolerating squatting. Since the introduction of the *state law 9,866/97* specific instruments and mechanisms for decentralized land use management and protection, allow interventions for environmental rehabilitation. The process also permits greater participation of the local community and grassroots through public hearings, partnership projects and other instruments included in the *City Act* and the city's *Master Plan*, to be discussed later (Alfonsin, 1997:199-219, Estado de São Paulo, 1998:13).

Today there are approximately 700,000 people living in the *Billings* watershed, of which over 121,000 live in precarious *favelas* (Capobianco and Whately, 2002:17). Insufficient alternative housing programs and social policies, in addition to a lack of political will and the absence of environmental law enforcement under past local governments have been major driving forces for irregular urban sprawl. To decrease the pressure on the housing sector,

squatting has been promoted or at least tolerated at the urban frontier and often the periphery receives dwellers that are relocated from prime locations in the centre of the city (Fix, 1996).

An alternative for the growing proportion of no- and low-income population is to join land invasions, which are often co-ordinated either by sect leaders (for example the Evangelical Pentecostal church, *Assembleia de Deus*), by local politicians (district councillors) or by landowners who expect the city to improve urban services in the area. In exchange for their vote or support, the leaders or individuals protect the settlers from eventual eviction. Frequently real estate agents also illegally claim and sell land. Squatting is sometimes organized by the 'roofless' movement' (*Movimento Sem Teto*). The process of land taking happens quickly, and when government officials take notice it is already a *fait accompli*. For some settlers, squatting is an income source, but for most it manufacturizes the short-term struggle for survival.

A first milestone addressing issues related to squatting was set with the incorporation of a chapter on urban policy in the Federal Constitution of 1988 (Fernandes and Rolnik, 1998:141), which requires cities with more than 20,000 inhabitants to elaborate a Master Plan that considers the potential effects of urban expansion and development. In article 183, it approves the right to *"…possession in private urban landholdings up to a maximum of 250 m² after only five years of peaceful, uninterrupted possession of the property"*, a condition termed *Usocapião* (Fernandes and Rolnik, 1998:147; Brazil, 2001:167). Although this measure was created to slow down urban mobility by providing for a more stable land tenure situation, without law enforcement and without providing housing alternatives, it has resulted in a further increase in illegal occupations and a drive to land speculation at the fringe.

Important changes in urban development are underway with the *Estatuto da Cidade* (City Act), a federal law enacted by the National Congress (Law No. 10,257/2001) as well as Municipal Law No. 15,547/1991 (Brasil, 2001 and Bassul, 2002). This act proposes participatory decision-making strategies in urban development (Article 20.II). The City Act provides the opportunity for legitimized participation of the community through neighbourhood or community associations and environmental NGOs (Article 50). It also stimulates citizens to initiate public action through the Public Ministry when collective rights are infringed. Neighbourhood associations with a mandate for environmental protection can thus take an active role in urban planning. There are also procedural juridical instruments that assist the state in intervention against violations to the principles of urban development. The Act further allows for legal usage of taxation or even expropriation in order to fulfil social purposes (Meneguello, 2002; Brazil, 2001). Land tenure contributes to the recognition of citizenship and fosters the dwellers' sense of place. Consequently, it also enhances the stewardship of community and environment.

In 2002, São Paulo's city council enacted the long awaited *Plano Diretor* (Master Plan) for São Paulo. The Plan, largely supported by the City Act, has to "*fulfil the constitutional premise to guarantee the social function of the city and of urban property*" (Brazil, 2001:43). It redefines urban land use zoning and focuses on the following major principles: (1) Act in solidarity towards excluded populations. (2) Consider housing as a social right. (3) Complete and expand roads and transportation systems. (4) Salvage the urban environment. (5) Transfer funds from developers to public works. (6) Strengthen the public sector's initiative and planning (Ibid:40). These two pieces of legislation provide new opportunities for correcting the disparities in urban development existing between core and peripheral areas and to implement actions to enhance urban liveability and sustainability throughout all parts of the city.

There have been several attempts to upgrade some of the squatter settlements. In the 1990s, the *Guarapiranga Project*, funded by the Inter-American Development Bank, tackled urban development and environmental education. The project has achieved some visible

improvements in housing, risk minimization, and basic infrastructure. Another project, *ProSanear*, funded by the Federal Government and executed by the state water agency SABESP, has addressed some of the environmental problems in the *Billings* watershed. Under this project the drinking water supply has been expanded into some squatter settlements and in 2002, under *Projeto Tietê* (IDB-SABESP funding), sewage collection was introduced in some parts of the *Billings* watersheds. The following section will examine some the particular challenges that remain in marginal settlements.

3.2 Liveability in the periphery: the squatter settlement *Pedra sobre Pedra*

During the late 1970s squatting began in the *Billings* watershed, south of São Paulo, initially primarily on land owned by the state electricity company (then called *Eletropaulo*). In 1980 one of the two remaining quarries was closed and then used as a landfill. Simultaneously squatting began and after 5 years about 100 families had already occupied some of the surrounding areas. Intensification of the occupation took place during the early 1990s, both on unconsolidated steep slopes and lower areas of the quarry in plots of approximately 20 to 50m^2 per family. The municipal government was unable to control land invasions on public land along the margins of rivers, creeks, and the lake. During the 1990s the dwellings rapidly expanded from the abrupt hillside to the limits of the dumping ground, consolidating the neighbourhood, *Pedra sobre Pedra* (stone over stone) (Photo 2). The proximity of this community to the municipal boundary of Diadema also explains the abandonment of the government. Infrastructure and services are frequently neglected in areas close to municipal borders.
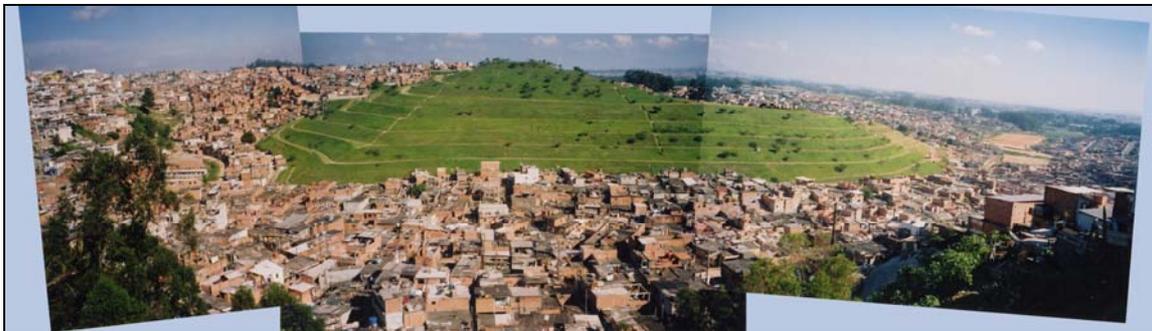

Photo 2: *Pedra sobre Pedra* settlement (PSP). (Photography by Jutta Gutberlet).

In 1999 a rapid urban appraisal was carried out in this settlement to map the risks, hazards, and impacts as well as the provision or lack of basic infrastructure and public services. The mapping took place together with 7 volunteers from the local neighbourhood association *(Associação Pedra sobre Pedra)* and from a nearby community association *(Sociedade Amigo do Balneario Mar Paulista)*. Previous work in the region and the local knowledge has facilitated the contacts and made it possible to circulate in this neighbourhood without restrictions. Besides the participatory mapping I applied the following other techniques: randomly sampled semi-structured interviews with the local population, group discussions, participant observation, and structured interviews with municipal government officials from the environmental secretary *(Secretaria do Meio Ambiente)* and the agency for sanitation and basic infrastructure *(SABESP)*. The neighbourhood association, *Associação Pedra sobre Pedra (APSP)* had organized community

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meetings and had arranged for a general assembly to discuss the research results, once the empirical work was concluded. The fieldwork was carried out always in the presence of the community leader (*Josemar)* and a social assistant *(Ruth Takahashi)* that had worked several years in the region. The research objectives had been discussed beforehand with the participants and a consensus had been reached upon which would be the quality of life indicators to be researched. Data collection further encompassed the search for existing maps, reports, publications, and grey literature.

The APSP was created in 1991, when the occupation began. According to Josemar there were approximately 4,000 unemployed, 650 children not registered in school and 120 people with physical disabilities, until the late 1990s. The association holds regular general assemblies in which up to 4,500 people participate. The following set of data sources has been taken into consideration in the present discussion:

1. Survey conducted by the neighbourhood association *Associação Pedra sobre Pedra* in 361 households.
2. Semi-structured interviews with household members and key-informants.
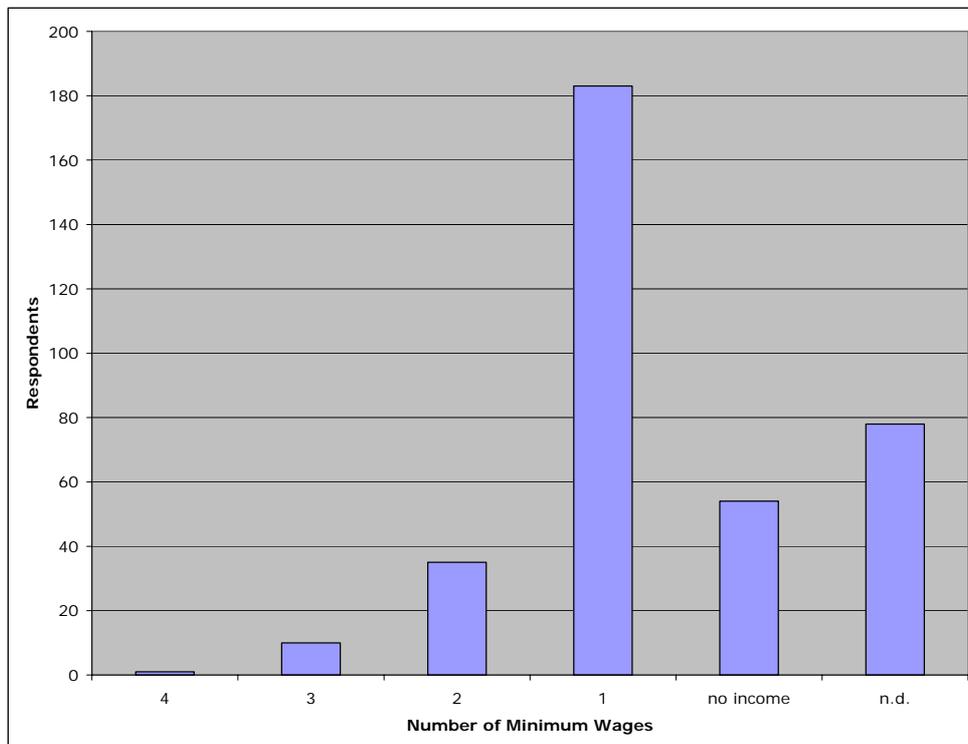3. Results from the participatory mapping.

Figure 1: Income variation in *Pedra sobre Pedra.*

Several members of the neighbourhood association were involved in conducting the household survey and the results were then entered into an Excel database. The results provide insights on the level of formal education, average household income, employment situation, housing density, and the locals' perception over perceived risks in the neighbourhood.

When asked about their socio-economic situation, 54 (15%) of the 361 households reported having financial difficulties and 25 (6.9%) mentioned not having enough food at home. In 24 cases (6.7%) the head of the household was unemployed and 13 (3.6%) were

illiterate. Five of the respondents were aware of the fact that they had built on a risk area. Remarkably, the majority of the households (63%) were headed by single mothers. When households were asked whether they were interested in buying the land they had occupied, only 9 answered yes and they were willing to pay a price between 20 and 50$Reais for their plot. The rest did not provide an answer to this question. In part, the low level of average household income explains this response. Figures 1 and 2 illustrate the precariousness of the economic situation in settlements like *Pedra sobre Pedra*. Many of the households have a large number of dependents (Figure 3).
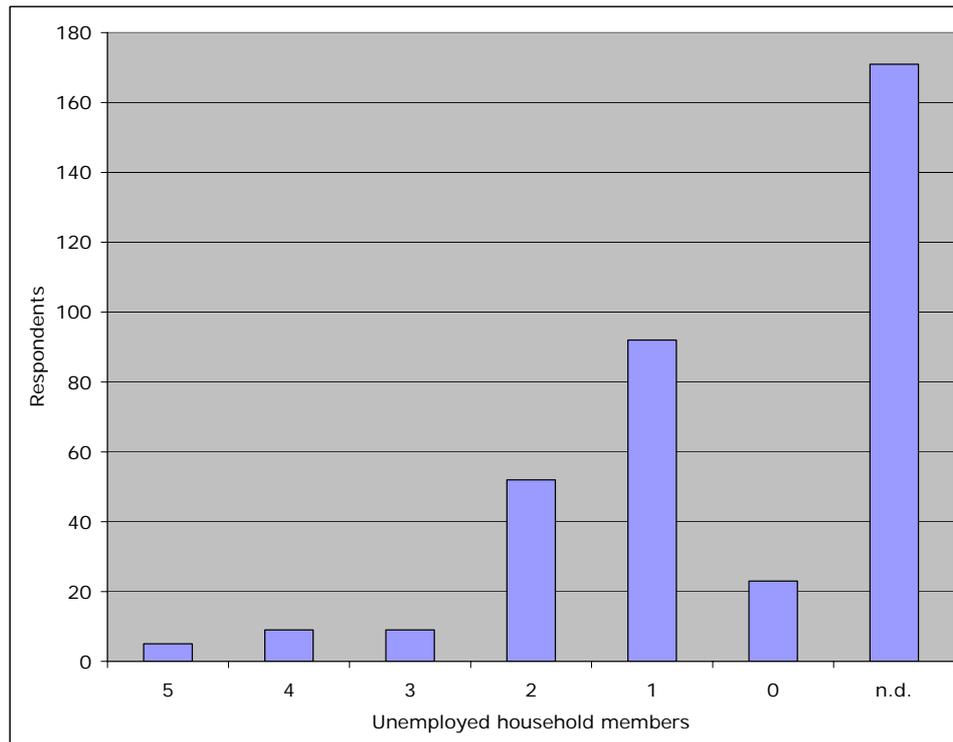

Figure 2: Number of unemployed household members. Income levels.

Other indicators were noted during the mapping exercise in the community; in which 4 to 6 people participated per day. The survey counted 1,276 stone houses, 1,038 dwellings built of mixed or improvised building materials and 56 houses still under construction. 114 houses were up for sale. The housing density is extremely high. There were only 6 vacant plots in the entire neighbourhood and very few green spaces. Out of necessity almost every centimetre of land is claimed. At the time of the survey, we counted 64 grocery and hardware stores, 26 pubs, 11 churches, and several other micro-enterprises, such as recycling, hairdressers, car repairs and electrical repairs.

While mapping the community heavy summer rainfalls destabilized one of the slopes and a landslide had pulled downhill several houses, killing one child. The lower situated dwellings were inundated for several hours by water and sewage, displacing families and damaging their belongings. These events always bear the risk of spreading infectious diseases, particularly *Leptospirosis*. Similar hazards occur regularly in São Paulo during periods of heavy rainfalls.

During three days intensive fieldwork we walked through all alleys and pathways and mapped the neighbourhood. We talked to the residents, took photographs and observed the

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living conditions in terms of risks, hazards and infrastructure. The resulting map (Map 2) points towards areas under risk from landslides and flooding, localized environmental impacts –such as irregular garbage deposits, sewage discharge, stormwater emission, leaking fluids from the waste dump– as well as areas lacking basic infrastructure, and public facilities. The map also shows major drainage flows, according to the prevailing slope orientation, indicating the direction of the storm water and hence the location of households under risk of flooding.
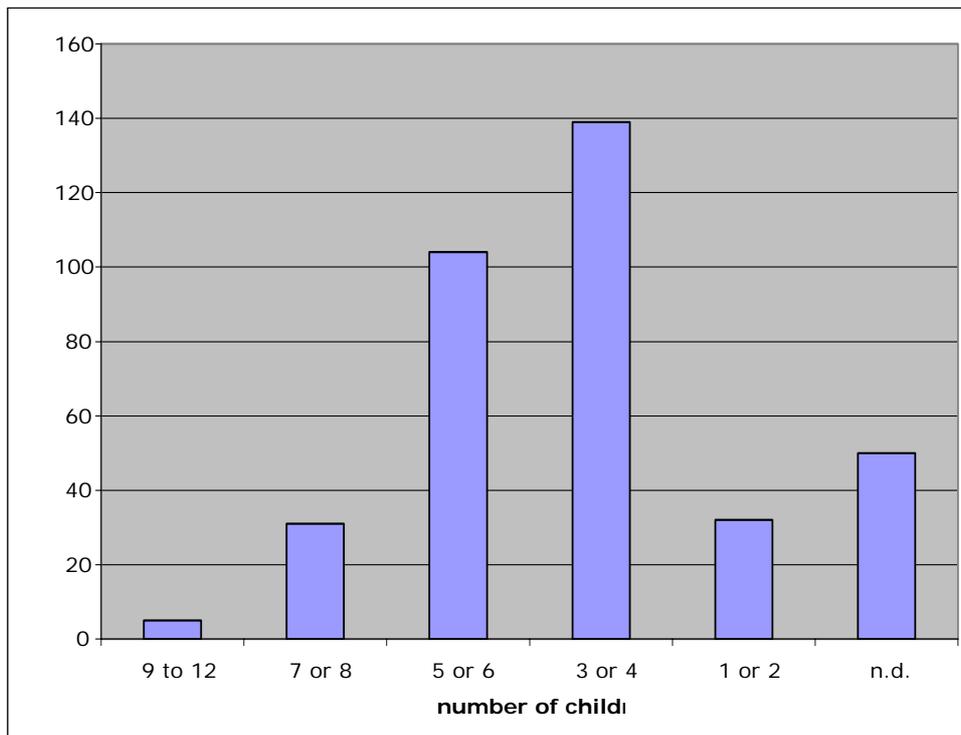


Figure 3: Number of children per household in *PSP*.

Until 1999, the majority of the dwellers in *Pedra sobre Pedra* accessed drinking water (94.7%) and electricity (95.5%) illegally, and most of the sewage was directed into drainage and streams, discharging finally into Lake Billings (Grupo Técnico de Apoio, 1999). There was no waste collection in this settlement, with garbage being dumped on open areas, into creeks, or piling up at the exit of the settlement.

Squatter settlements are considered illegal occupations and therefore there is no official regular garbage collection. The population deposits their waste at the entrances of the settlement or at unoccupied land or into the drainages (see Map 2). The dwellers frequently complained that others would just throw their garbage downhill, often on top of the roofs or between the houses (Interview conducted with leader of APSP, 19.12.1998). This has been identified by many interviewees as causing slope instability and health threats. In fact, the massive accumulation of garbage as well as the open discharge of used water and sewage has contributed to the formation of landslides and floods. Waste also attracts and maintains large numbers of rats and insects; however, when removing the waste without dealing with the population of these animals, they are likely to attack humans, as has been confirmed by the experience of government agents also in other settlements (Interview conducted with Environmental Secretary, 20.01.1999).

Photo 4: Plastic bottles a main hazard causing floods Photography: Jutta Gutberlet

The absence of public waste collection that results in unhealthy circumstances, as well as the perception of a chance to generate income through recycling, have inspired a waste collection and recycling program co-ordinated by the neighbourhood association (Gutberlet and Takahashi, 2002). The association had to overcome incredible difficulties in order to maintain and expand this activity. It also has provided important inputs to the formation of the Recycling Forum of São Paulo (*Fórum Recicla São Paulo)* in 2000. In 2000, members of the neighbourhood association produced a music CD on environmental educational issues, which has since been used for educational purposes.
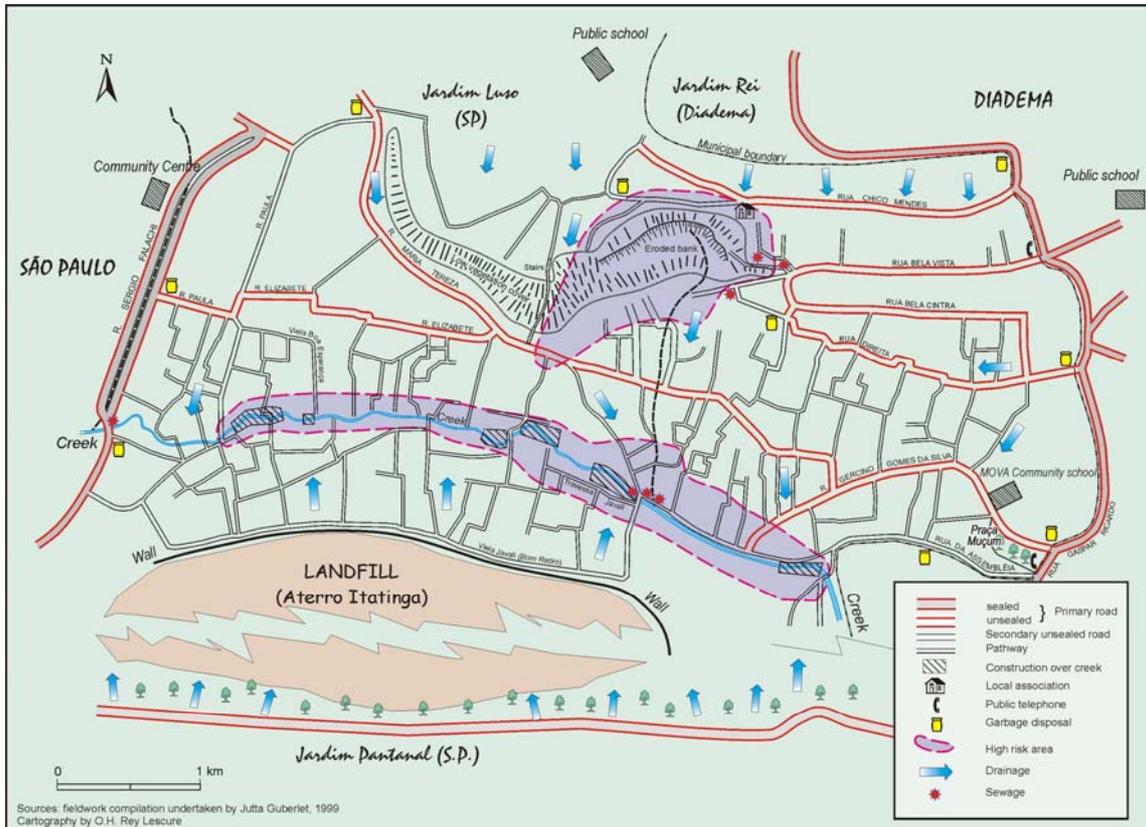
Map 2: Major risks and hazards identified by the locals in *Pedra sobre Pedra*.

In recent years, the municipal Government has attempted to improve the drinking water supply in squatter settlements. Water is becoming a scarce resource in São Paulo and has to be rationed in many neighbourhoods in São Paulo, particularly during the dry winter months. Inefficiency is one of the reasons for the waste of this resource. In São Paulo, 42% of the drinking water is being lost mainly due to inefficient and unaccounted water supply (SABESP, 1997). Water leakage is common and often a result of the lack of maintenance and irregular connections to piped water.

4. CONCLUSION: COMMUNITY EMPOWERMENT: A PATH TOWARDS INCLUSION

The case study provides insights on socio-economic and environmental exclusion at the periphery of São Paulo as it happens in other cities and in other countries with large income disparities. It highlights the primary forces that drive the expansion of irregular squatter settlements: social exclusion, poverty, lack of social housing policies, and land speculation. Deficient basic infrastructure also causes environmental and health problems. Squatters are confined in unhealthy and crowded living conditions at the urban fringe. Public policies have so far bypassed urban development and environmental protection laws in the periphery leading to an unprecedented environmental and social crisis. This is reflected in land degradation, erosion, deforestation, and pollution in a watershed, which provides for part of the city's drinking water supply. The social crisis is visible with widespread poverty and social exclusion, elevated crime rates, and the frequent illicit drug trafficking. Due to high intra-urban mobility

and immigration from poorer regions in Brazil, particularly from the Northeast, the peri-urban spaces are growing in a continuous and rapid pace. Public policies are insufficient to tackle the urgent emerging social and environmental issues. On the other hand, the still unresolved land tenure situation makes it difficult for squatters to create a sense of place and to invest in social cohesion in their settlements. In addition, environmental education and awareness is low as a consequence of social exclusion. Environmental degradation becomes very obvious at the fringe with erosion as a consequence of the removal of the vegetation cover, particularly on steep slopes; the disposal of untreated sewage and garbage into the water catchment; air pollution as a consequence of garbage incineration; and the increase in local traffic causing more air pollution and noise.

In 2000 the municipal government had undertaken some steps to respond to the crisis. The disastrous landslide in 1998 and the physical presence of the researcher and the discussions with local government agents have contributed to the implementation of a program to regulate the access of electricity and drinking water (*Projeto ProSanear*) initiated in 2001, which included *Pedra sobre Pedra*. As a result most dwellings are now connected to the official water and energy supply. Several access stairs and drainage for storm water along the main pathways have been built. Some of the households identified in the community map as risk areas have been relocated. So far, years have passed but nor the park, plant nursery, community garden and centre for environmental education, proposed by the neighbourhood association have been implemented so far.

Communities need to be able to access funds and information on appropriate urban development. It is currently very difficult for a neighbourhood association to implement self-help measures, because finding public resources is usually an unsuccessful endeavour. It requires time, persistence and resilience to continue in the struggle for community development. The neighbourhood association in *Pedra sobre Pedra,* for example, has been engaged for years in the struggle for recognition and support for measures that improve the quality of life in their community. The research results have to some extent contributed in the generation of knowledge for the community, which has helped to draw attention to the precarious living conditions in this particular settlement and which has empowered the community in their demand for social inclusion.

Participatory, bottom-up development strategies are particularly important with respect to the questions of who determines, who decides, and who applies these rules regarding urban development (Mazzucchelli, 1995; Amin and Thrift, 2002). It is the responsibility of local governments to involve the communities in the assessment and implementation of measures to fulfil the needs in terms of infrastructure and social services. It is also an obligation of the global community to respond to this situation of deprivation, with actions of redistributing resources. International pressure to change the structures and procedures responsible for the current situation of uneven development is growing. Debt relief, fair trade, equitable trading conditions, access to micro-credit schemes, appropriate technology, and the suspension of structural adjustment programs that oppose local community development are some of the demands of social movements, NGOs, community groups, and governments for more sustainable communities. Furthermore local development following a bottom-up and inclusive rational are proven to be much more successful in addressing the above outlined pressing needs.

The current experience underlines the importance of involving the community in the research process. Participatory appraisals and community mapping provides the local leadership with instruments that can empower their community in their struggle for improved liveability. Once the fieldwork was completed and first results compiled into the map a general assembly was held with the presence of local authorities, participants of NGOs and

neighbourhood associations from the region, and the general public. It was an opportunity to communicate first research results and to receive feedback from the public. The event was also used as an opportunity to talk about environmental education and to communicate about the local recycling initiative of APSP. We displayed separated piles of compressed plastic bottles and aluminium cans to emphasize public participation in the process of recovering resources and cleaning up the environment.

This part of the research process is imperative because it stimulates discussion and mobilization within the community to break the cycle of social exclusion. The participants also used the event to put pressure on the government to act on the findings in terms of minimizing the risks and improving the quality of life.

It is well known and documented that bottom-up, participatory approaches are more complex and take longer in their implementation. Widespread community participation in the conduction of the research is difficult to obtain and according to Zanen and De Groot (1991) the enhancement of participation first of all requires that people be treated as knowledgeable and trustworthy actors. As a prerequisite for participatory research strategies the researcher must be humble and must value local knowledge. Nevertheless, we usually hear the voices of the most engaged individuals, which typically are the most political and well educated (Carley, 2001). Grassroots approaches demand ample negotiations between the stakeholders with different expectations and necessities and they build on partnerships. My own research experience confirms the fact that the process itself impacts on the community and on the stakeholders involved. It raises problems, identifies assets and discusses appropriate solutions. It is not only the research outcome but it is rather the researching process itself that contributes to change. Action oriented research is based on local participation, empowering the stakeholders and strengthening local autonomy (Mahon, et al. 2003).

The segregation between poor and rich spaces hides the extension and level of poverty in the urban fringe. In São Paulo, peri-urban areas, with extremely high rates of population growth, precarious living conditions, and high levels of environmental degradation are usually not on the top of the political agenda. Only recently, with a greater tendency towards political and administrative decentralization based on smaller administrations (*sub-prefeituras*), local development approaches, such as participatory budgeting or community representation are becoming more realistic.

The focus for a more socially just urban development towards greater liveability and urban sustainability needs to be on long lasting, appropriate, and locally adapted resolutions. Governments can provide the necessary conditions to generate spaces for dialog, participation, and transparency. Public hearings, general assemblies, and participative councils bear the potential of producing sustainable urban development. Finally, urban movements, neighbourhood associations and co-operatives are important in empowering socially excluded citizens and in challenging current development in favour of more participatory planning and decision making approaches that improve overall sustainability.

A paradigm shift is necessary to attain long-term growth in quality. Development needs to be re-thought as a process towards the construction of sustainable communities from the bottom-up, involving the local community. This also means that development should not be grounded in the externalization of environmental and social costs. A change from quantitative to qualitative development is needed. Environmental awareness training and interactive learning as well as participatory, community-based approaches are some of the prerequisites that can provoke effective change towards increased sustainability and liveability on a long-term basis.

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