



Social and environmental exclusion at the edge of São Paulo, Brazil

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Urban poverty and social exclusion are overwhelming concerns with more than 32% of the world's urban population living under precarious housing conditions. The paper presents findings from three studies documenting the evolution of a squatter community on the southern edge of São Paulo city. The qualitative data collected between the late 1990s and 2007 will highlight critical socio-environmental living conditions in the periphery. Benefits and limits of water supply and sanitation upgrading projects will also be identified. Recent directions in public policy addressing these social issues are reviewed. The paper underlines the pressing demand for more inclusive decision-making processes in the planning and implementation of sustainable community development.

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Introduction: Unbalanced urban development

In developing countries there are obvious geographic disparities in the distribution of basic infrastructure, public services and the offering of opportunities for social development between poor neighbourhoods in the periphery and central high-income areas. The expansion of precarious housing is growing worldwide with the rapid population increase in cities. Particularly in marginal areas, people and land are becoming excluded from qualitative development (UN-HABITAT, 2007). It is a central matter to address these inequities and deficiencies that affect the quality of life of significant parts of the urban population (Harris, 1992; Potter *et al*, 2003; Mitlin, 2005). This paper analyses the living conditions in a squatter settlement in the periphery of São Paulo and reviews root causes for lifelong exclusion. The fringe of São Paulo is also excluded from environmental protection and has received industrial waste and sewage for decades

despite serious environmental health issues. Finally, the paper addresses possible changes in governance to solve these problems.

Accelerated urban growth has been a dominant trend over the past few decades in South America where currently more than 75% of the population lives in cities, compared to 38% in Africa and 36% in Asia (UNPOP, 2000). Brazil is one of the most urbanized countries in Latin America with approximately 81% urban population (IBGE, 2000). With the rapid rural–urban population shift since the 1970s, poverty in absolute terms is increasingly becoming an urban problem, particularly visible in large agglomerations. The *UN-Habitat Report* estimated that 32% of the world's total urban population, or nearly 924 million people, were living in slums in 2001. Approximately 43% of the urban population of all developing regions together and 78% of the least developed countries lived in poor neighbourhoods. Projections show a further increase of precarious and risk-prone living conditions for additional millions of people and vulnerability particularly of the urban poor segment of the populations with accelerated climate change factors in place (UN-HABITAT, 2007, 2003).

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Over 68 million inhabitants, almost 40% of the total population in Brazil, live in the largest urban agglomerations (IBGE, 2000). Traditionally the southeast of the country (São Paulo, Minas Gerais, and Rio de Janeiro) is considered to be the economic heart of Brazil. This region is also the most urbanized with about 90% of its population living in cities. However, recent census data show that most of the very large cities are losing population due to agglomeration diseconomies, whereas municipalities with more than 20 000 inhabitants continue to grow by a rate of 3% annually. Growth is most evident in cities between 100 000 and 500 000 people (IBGE, 2000).

One of the most populous metropolitan regions in the world is the Greater São Paulo Metropolitan Region, which includes 39 municipalities covering an area of 7947 km². In 2006 it was home to 19.7 million inhabitants, 10% of the total Brazilian population (EMPLASA, 2007). Over 40 years, the urban area in this region had expanded from 874 to 2209 km² in 2002. The pace of population growth has slowed down from 1.9% between 1980 and 1991 to 1.6% between 1991 and 2000. Today the city of São Paulo has approximately 11 million inhabitants and grows at a rate of 0.4% per year. Between 1980 and 1991 the overall annual growth rate for the city was approximately 1%, whereas the rate for informal settlements was 6.2% (Taschner, 1995; Taschner and Bogus, 2001). Almost 20% of the population lives in *favelas*, precarious housing next to rivers, roads, or on steep slopes, compared to 1% during the 1970s (Grostein, 2001). Many of the newer settlements at the urban fringe are the result of intra-urban migration due to the removal of poor neighbourhoods in inner-city areas for the expansion of new infrastructure, commercial, and housing projects (Prefeitura do Município de São Paulo, 2000, pp. 14, 95). When urban growth happens without planning and infrastructure expansion, it often generates severe social and environmental problems. These are particularly visible in poor neighbourhoods, so-called squatter settlements, at the periphery of São Paulo.

The term squatter refers to 'uncontrolled, low-income residential area with ambiguous legal status regarding land occupation.... [The] usual image of a squatter settlement is of a poor, underserved, overcrowded and dilapidated settlement' (HABITAT, 1982, p. 15). These are the spaces where access to drinking water, sewage,

waste collection, and other basic public services have to be improvised, where housing is risk-prone, where green and cultural spaces are absent or rare, and where the environment is unprotected. Here public and environmental health is at stake since public services and infrastructure are in such precarious conditions or are missing.

The paper discusses results from an assessment conducted in the squatter settlement *Pedra sobre Pedra*, initiated in 1999, complemented in 2003 and in 2007. Indicators such as housing, public infrastructure, access to public services, recreational and educational facilities, risks and hazards were identified and mapped to evaluate the quality of life in this neighbourhood. The assessment was conducted together with community members of the local neighbourhood association. The research also aimed to empower the local community members by providing opportunities for interactive learning and by increasing the visibility of excluded urban communities.

Consequences of social exclusion

Social exclusion (Room, 1995) provides a useful theoretical framework to analyse the factors and processes involved in the marginalization of urban population in developing countries. The International Labour Organisation (ILO) refers to social exclusion as a 'process of social disintegration, a progressive rupture of the relationships between the individual and society' (1996, p. 9). Exclusion surfaces either as marginalization from the rest of society through economic deprivation and social disadvantage or as social and cultural segregation by fragmentation of social relations. The increased risk of a breakdown of social cohesion due to growing exclusion is recognized in the literature for industrialized countries (Room, 1995). In the developing world exclusion works as a way of controlling and subduing people (Young, 1990) and hence becomes a strategy to maintain hegemonic structures and power distribution.

The concept derives from the idea of 'society as a status hierarchy, comprising people bound together by rights and obligations' (Walker, 1995, p. 103). Exclusion 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. Hence, there is a central concern focusing on dominant institutions and rules that enable or restrict social interaction. Social exclusion is recognized as a state of ill being that disempowers and disables people from being full citizens, isolating them from the rest of society (ILO, 1996).

The stigmatization of certain groups as being 'underclass' who are worth less is another aspect that reiterates social exclusion and provides excuses for the rest of society and, particularly, for politicians in power to not do enough (Gans, 1996). Strong prejudices against people from marginal settlements are related to race, education, and income, and ultimately these people are interpreted as having a lower social status within society. A notable example of racial segregation in Brazil is the resentment against migrants from the northeast. Historically disadvantaged by poverty and reduced access to educational and professional training, they also suffer from racial barriers based on their African cultural background, which makes them third-class citizens.

Gender-related prejudices force women into disadvantaged employment patterns and social roles. However, the most affected are marginalized children and young people, since they are deprived of future opportunities. In not having access to a regular and healthy diet and primary/secondary education, as well as professional training, they usually become unemployed or underemployed and end up in the informal sector. With an increase in the number of households having to cope with insufficient income, the number of children living in the streets is growing in Brazil. A study revealed that 1.25% of children below age 6 and 4.6% between ages 7 and 17 were living in the streets at night in São Paulo (Prefeitura do Município de São Paulo, 2000, p. 61). Often these children consume drugs (alcohol, tobacco, and illicit drugs) and become involved in drug trafficking, drug consumption, prostitution, and crime. Since they often have to contribute to the family budget, or have to make a living for themselves, they undertake informal activities (delivery, guarding services, collecting recyclables, street sales, washing cars, polishing shoes, and other street services including prostitution and drug dealing) or begging (Zaluar, 2001).

Economics and social exclusion

Economic recession and structural adjustment programmes have a strong impact on public spending, particularly on the public health, education, and housing sectors (SAPRIN, 2002). This situation reinforces the already existing social and economic disparities and disadvantages highlighted early on by Bello (1993) or Drakakis-Smith (1996). Institutionalized corruption, political clientelism, and short-term measures of populist political nature are also responsible for the permanence of chronic and widespread social and economic inequalities and growing regional disparities. These circumstances 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' (Yapa, 1998, p. 95). The existing political, economic, and social structures need to be challenged so that the problems of exclusion are addressed.

Poverty and socio-economic marginalization are the most prominent characteristics of exclusion in developing countries (Figueroa *et al*, 1996; Douglass, 1998; Auyero, 1999; Daniere and Takahashi, 1999; Mitlin, 2005). In Brazil, social exclusion has been a facet of economic development since the colonial period and has particularly expanded since the 1970s. Today exclusion affects more elderly people, more children, and more white people with a non-migrant background than ever before (Prefeitura do Município de São Paulo, 2002). The phenomenon of exclusion is widely recognized in the literature in developing countries and has also entered policy levels, with governments often creating specific agencies and programmes to counteract its development.

Over the past decade concepts linked to poverty alleviation have changed from income-oriented economic approaches (promoted by the World Bank and the International Monetary Fund) to Amartya Sen's *capability approach* (Frediani, 2007), from multi-faceted approaches focused on distributive issues, such as access to adequate health care, education or food (Satterthwaite, 2001) to a more recently extended framework including the dimensions of vulnerability, powerlessness, and inclusion (Hjorth, 2003, p. 383). Today the divide between the all-encompassing concept of social exclusion and the current complex framework



analysing the causes responsible for poverty has diminished (Frediani, 2007). Linkages between poverty and the environment have become widely acknowledged with the development of the sustainable livelihood concept (DFID *et al*, 2002; Rakodi and Lloyd-Jones, 2002; Mitlin, 2003; Bury, 2004). Social exclusion theory seeks to understand how livelihoods can be threatened and transformed under particular circumstances of exclusion. It takes the activities that people perform on the household level and that sustain their livelihood to a broader and international scale. Various levels of analysis are touched in this approach, engaging wider questions of political economy.

Social exclusion and the environment

Poverty and social exclusion often generate environmental degradation. Illegal occupation produces deforestation, water contamination, and air pollution. Being socially excluded also means being more vulnerable to environmental risks. The lack of access to economic resources, education, and information exposes these groups to disease vectors, risks, and hazards, which could be avoided. Exclusion stimulates and increases crime against the people and the environment in the periphery. Environmental injustice comes to light in São Paulo as environmental hazards are placed right next to low-income neighbourhoods. At the periphery, exclusion is reflected in lawlessness, lack of enforcement of human rights, and lack of environmental protection legislation.

The concept of justice has been present 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; Bullard, 1990a b; Bullard and Wright, 1990; Bryant and Mohai, 1992; Heiman, 1996; Bullard and Johnson, 2000). 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 distributional outcomes gave rise to the notion of 'territorial justice', a measure of fairness in the distribution of accessible public services that is also related to the proximity to undesirable land uses. Important debates on fairness with respect to the distribution of environmental quality and risks emerged in the USA during the 1980s (Braham and Janes, 2002). Low and Gleeson reveal 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, p. 104). Plotkin (1987), for example, documented 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. Since then, environmental justice has become a key component in national debates and policy-making (Been, 1993, 1994; Pulido, 1996).

Sustainable urban livelihoods

Sustainability is defined as 'long term cultural, economic and environmental health and vitality' (City of Seattle, 1993, p. 2). Sustainable development requires the balance between economic, environmental, and social needs. The *Local Agenda 21* was proposed at the United Nations Conference on Environment and Development (UNCED) in 1992, to generate this balance. It is an agenda to promote actions for sustainable development at the local level (ICLEI, 2005). Sustainability 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 and it erodes environmental and social capital. Social capital is 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' (Bury, 2004, p. 79). Exclusion therefore jeopardizes social and environmental capital and ultimately affects sustainability.

Liveability expresses the quality of life for a population in a certain space. It refers to entitlements and 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, p. 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'. A direct connection exists between livelihoods and citizenship rights. Under some circumstances, people can become excluded from consuming what are considered to be basic public goods and services (Sen, 1992)



Researchers, communities, and governments have applied a wide range of indicators to evaluate the long-term quality of urban communities and environments (City of Seattle, 1993; Mitchell *et al*, 1995; Maclaren, 1996; Huang *et al*, 1998). The *Local Agenda 21* has been one of the milestones to translate the results obtained from these indicators into actions and strategies to improve the quality of life (Parker, 1995). The International Council for Local Environmental Initiatives (ICLEI, 2005) supports the enhancement of local governments dedicated to the *Agenda 21* principles for liveability and sustainability. Table 1 summarizes major indicators for sustainability and liveability. Some of these factors will be

addressed in the present case study. The indicators can also be applied in the context of the sustainable livelihood framework (see DFID, 1999; Arce, 2003; Hinshelwood, 2003), which takes into account the different scales of interaction (local to global), the vulnerability context under which individuals or communities operate, and the specific assets individuals or communities have.

Urban expansion into São Paulo's water protected areas

There is a sharp contrast between spaces for the better off and spaces for the excluded. Govern-

Table 1 Assessment of urban sustainability and liveability

Key areas of concern	Quality indicators (<i>sustainability</i>)	Accessibility (<i>liveability</i>)
Physical/natural environment	Air and water quality, soil degradation, erosion, density and diversity of vegetation cover and animal life.	Clean air and clean streams, slope stability, availability of green public spaces, trees.
Urban form and function	Architecture and quality of urban form, functionality of public spaces and buildings, protected cultural heritage. Quality (diversity and use of native plants) and degree of landscaping and open spaces in the city.	Availability, access and efficiency of urban functions. Location of public spaces and buildings (transport accessibility). Preservation and maintenance of local cultural heritage. Leisure and recreational areas.
Housing	Building materials (efficiency, costs, use of recycled materials), durability and degree of adaptation to the natural environment.	Adequacy and availability of housing. Quality of housing (density, risk exposure, building materials). Location (transport convenience), distance to the centre, to workplace and other urban functions. Land tenure.
Basic infrastructure	Appropriate and efficient technology regarding <ul style="list-style-type: none"> ● energy source and efficiency (degree of renewable/non-renewable energy sources) ● quality of drinking water ● sewage collection network and treatment system ● waste management (forms of disposal, recycling) ● transport efficiency and impacts. 	<ul style="list-style-type: none"> ● Electricity, clean water, sewage/grey water collection, garbage collection, recycling. Incentives for alternative energy generation and waste recycling. ● Accessibility of drinking water, regularity of access and quality. ● Availability, efficiency and quality of public transport, local road system and illumination of public spaces.
Health and education	Availability and quality of <ul style="list-style-type: none"> ● public health system (preventive, holistic medicine) ● pollution prevention measures ● public schools, universities, professional training facilities. 	Accessibility and quality of health care, health-related infrastructure and educational facilities (child care, pre-school, primary school, university, professional training). Environmental education/awareness programmes. Community activities (horticulture, communal work).
Livelihood	Incentives for environmentally 'clean' production, sustainable production/consumption. Full employment	Employment (diversity and vitality of employment). Purchasing power. Access to local food production (bioregionalism and urban agriculture).
Social environment	Local safety and health. Cultural and recreational activities	Security (no crime, no violence). Access to recreational and cultural opportunities. Community empowerment (participation in democratic decision processes, local representation). Sense of place.

ment and privately funded, luxurious urban development in privileged areas starkly contrasts with deprivation in the periphery of major Brazilian cities. According to the 2000 census data, 10.2% of the population in the municipality of São Paulo lives in precarious and risk-prone conditions (IBGE, 2000). In 2000, 4600 illegal settlements, often with inadequate sanitary conditions, were identified by IBGE (2000).

Institutionalized corruption, political clientelism, and short-term measures of a populist political nature are responsible for chronic and widespread social and economic inequalities and

growing intra-urban and regional disparities. Gilbert (1994) and Rocha (1997), for example, have discussed these implications as a consequence of neo-patrimonial power structures. Reports on corruption scandals are everyday in the news in Brazil and have created a sense of widespread resignation when it comes to politics. At the same time the deficiencies in housing, education, and health continue to increase.

There was a noticeable rise in squatting, particularly in the outskirts next to the drinking water catchments of Lake *Billings* and Lake *Guarapiranga* in the south of the city, since the early 1990s

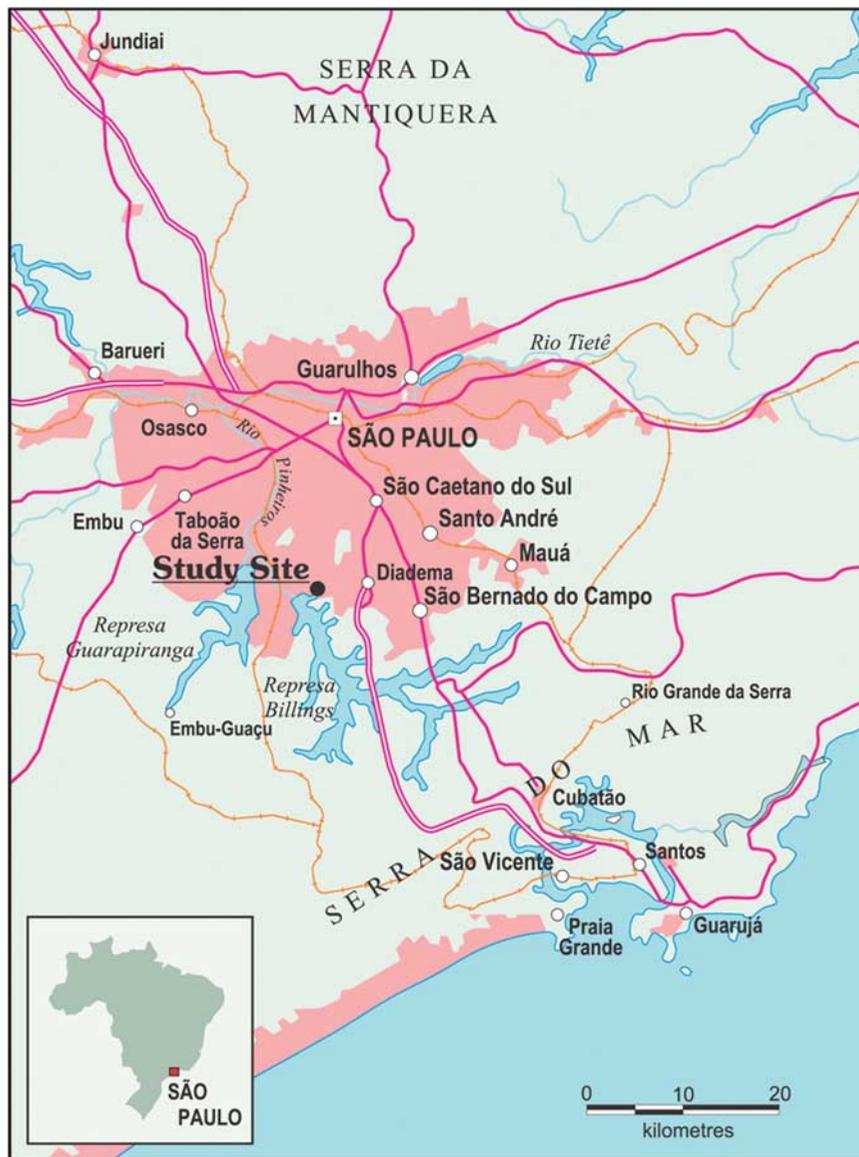


Figure 1. Localization of the metropolitan region of São Paulo and the case study site. *Source:* Jütta Gutberlet (2008).



(see Figure 1). This spread directly reflects the growing demand for cheap housing due to increased poverty and unemployment. The crisis was accelerated by a set of federal economic policies that led to a rise in rental property and restrictions to access savings, these measures were hitting particularly low- and also the middle-income people. In large cities, a rush began towards the fringe to buy or occupy land and to improvise dwellings, to avoid highly inflated rental costs in more central locations (Taschner, 1995). The expansion into the two watersheds was a result of the local and state government's inability to enforce the watershed protection legislation, thus creating a situation of lawlessness and lack of environmental protection. As a result, a strong intra-urban migration flow began towards this part of the city.

Irregular occupations are often coordinated by religious or political leaders. In exchange for their support or vote, the settlers receive temporary protection from eventual eviction. Frequently real estate agents also illegally claim and sell land and with the transaction completed they disappear. Sometimes social movements like the 'roofless movement' (*Movimento Sem Teto*) organize squatting. The process of land taking happens quickly, and when government officials in charge finally take notice, it is already a fait accompli.

The implementation of watershed protection legislation from 1975/76 (state law no. 898/75 and 1.172/76) was meant to preserve the environment by restricting population density around the *Billings* and *Guarapiranga* reservoirs. Instead, the legislation reduced land values in the area (Budds *et al*, 2005). Without enforcement of the legislation low-income families were attracted to the area and illegal high-density settlements ensued. Between 1955 and 1992, untreated sewage and wastewater from the main rivers *Tietê* and *Pinheiros* were pumped into the lake, while the lake's overflow was used to generate hydroelectric power at the bottom of the 700 m high *Serra do Mar* mountain range, in Cubatão. The input of toxic industrial contaminants and biological pathogens over decades resulted in a dead water system. The government's inability to enforce the environmental protection laws and the lack of integration between public agencies and their policies further contributed to the uncontrolled spread of informal settlements and environmental degradation.

A revision of the law was made in 1997 (state law no. 9866/97) and specific instruments and mechanisms for more decentralized land use management and protection were introduced. An important innovation of this new piece of legislation is the introduction of land-use and protection measures adapted to the specific situation of each watershed, allowing intervention for environmental rehabilitation. The process also permits greater participation of the local community and grassroots organizations in the discussion on land use and resource management through public hearings, the establishment of partnerships between the government and NGOs, and through other instruments included in the *City Act* and the city's *Master Plan*, to be discussed later in this paper (Alfonsin, 1997, pp. 199–219; Estado de São Paulo, 1998, p. 13). There are currently 700 000 settlers in the *Billings* watershed, of which over 121 000 live in precarious *favelas* (Capobianco and Whately, 2002, p. 17).

There have been several attempts to upgrade squatter settlements in these two watersheds. During the 1990s, the *Guarapiranga Project*, funded by the Inter-American Development Bank, tackled urban development and environmental education in the *Guarapiranga* watershed, with some visible improvements in housing, basic infrastructure, and risk minimization. The programme contributed to an overall urban and environmental revitalization of the region. More recently the *ProSaneam* project, funded by the federal government through a World Bank loan and executed by the state hydro agency SABESP, began to address some of the local environmental problems in the *Billings* watershed. In 2002, the programme expanded the supply of drinking water into some squatter settlements and infrastructure was put in place to begin collecting sewage in parts of the *Billings* watersheds to improve the local drinking water quality, under the *Projeto Tietê* (SABESP, 1996).

In order to decrease pressure on the housing sector, squatting in the periphery was promoted or at least tolerated under past governments. Insufficient alternative housing programmes and social policies, in addition to lack of political will and absence of environmental law enforcement by local governments, have been major driving forces for irregular urban sprawl. In some cases, *favelas* that gave way to new developments in the

centre were relocated into the *Billings* watershed (Fix, 1996).

A first milestone addressing land tenure in informal settlements was set with the incorporation of a chapter on urban policy in the Federal Constitution of 1988 (Fernandes and Rolnik, 1998, p. 141), which requires cities with more than 20 000 inhabitants to elaborate a Master Plan. In Article 183, this Constitution further approved the right to '...possession in private urban land-holdings 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, p. 147; see also Brazil, 2001, p. 167). Although these measures were created to slow down urban mobility by securing land tenure, without law enforcement and without providing housing alternatives, it provoked the opposite: a rush towards illegal occupation and a drive to land speculation in the periphery.

Living at the metropolitan edge: a case study to assess facets of the quality of life in squatter settlements

Until the early 1970s, the *Billings* watershed remained primarily rural, with mining (granite, gravel, and sand) and a few – though polluting – back-yard industrial activities, horticulture, cattle ranching, and low-density exclusive housing adjacent to the lake (*Balneário Mar Paulista*, *Sete Praias*, *Praia Vermelha* in *Eldorado*). Low-income settlements began to expand during the 1970s along the margins of the lake, primarily on land owned by the public electricity company *Eletropaulo*. In 1980, one of the two remaining quarries in the region was closed and the site became a recreation and leisure place for the locals. In the late 1980s, the municipality first used the site for dumping inert waste and later household waste and the location became known as the *Itatinga* landfill. By then about 100 families had already occupied the surrounding areas. Despite obvious environmental conflicts and resulting health risks, the government tolerated this development.

In the early 1990s, swellings rapidly expanded and thousands occupied the unconsolidated steep slopes and lower areas of the quarry. At the same time, adjacent private land was illegally subdivided and sold as small plots (20–50 m²). The

proximity to the municipal boundaries of *Diadema* explains the negligence with which the government of São Paulo treated the area. It frequently happens that the local government abandons frontier regions since none of the city administrators wants to take responsibility and invest in upgrading the fringe. Voters at the periphery are still easily persuaded with paternalistic measures, discourse, and gifts.

The settlement *Pedra sobre Pedra*

Through the need to mobilize residents and jointly initiate community improvement projects, unofficial community associations developed in the squatter settlement surrounding the *Itatinga* landfill. As a result, the large squatter settlement is made up of several self-designated neighbourhoods. This study focuses on the *Pedra Sobre Pedra* neighbourhood situated in the *Cidade Julia* squatter community located on the northern half of the landfill (Figure 2). Three independent research projects were conducted in 1999, 2003, and 2007 in collaboration with the local neighbourhood association, *Associação Pedra sobre Pedra*. Each study used a combination of qualitative methods and quantitative surveys to assess physical and social conditions of the community at each time period. The research methods were not standardized between each project. The results of the three studies, however, were able to document clear stages of evolution in the community as a result of the *ProSanear* water supply and sanitation project that began in 2000 and ended in 2003.

Before the *ProSanear* project

A socio-economic survey was conducted by the local neighbourhood association *Associação Pedra sobre Pedra*, in 1998, before our research projects began. Their survey of 361 households provides first insights into the level of formal education, average household income, employment situation, housing density, as well as about the locals' perception of risks. This survey revealed that 15% of all households (54) reported financial difficulties and that 7% (25) could not access enough food. In 7% (24) of all households the head was unemployed, and in 4% (13) he or she was illiterate. Five of the respondents were aware of the fact that they had built on a risk area. The



Figure 2. *Pedra sobre Pedra* squatter development. Source: Jütta Gutberlet (2008).

most striking finding indicated that the majority of the households (63%) were female headed. When asked whether they would buy the land they had occupied, only nine answered with yes and they were willing to pay between 20 and 50\$ Reais (equivalent to 17–42 US\$) for their plot. The rest did not answer this question, probably because it did not seem a realistic option for them, given the prevailing level of poverty.

A study was conducted in 1999 in collaboration with the *Associação Pedra sobre Pedra* to assess the quality of life in *Pedra Sobre Pedra*. The research involved mapping, conducting semi-structured interviews, group discussions and participant observation. Several members of the association helped with the organization of community meetings to inform and receive feedback from the locals and with the planning of a general assembly. Two schoolteachers from neighbouring communities also assisted with the project. Given the widespread resignation and apathy as a result of exclusion, only a few community members volunteered to participate in the research. Study participants identified five main indicators that were used to assess quality of life in the community: risks and hazards; basic infrastructure, public services, housing and green spaces. Mapping of these indicators was carried out over several days while talking to the local residents.

During the mapping we counted 1276 stone houses, 1038 dwellings built of mixed or improvised building materials, and 56 houses that were still under construction. In all, 114 houses were already up for sale. There were only six vacant plots in the entire neighbourhood and virtually no open land or green space. At the time of the survey, we counted 64 grocery and hardware stores, 26 pubs, 11 churches, and several other mostly informal businesses, 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 several houses downhill, killing one child. The dwellings situated lower in the community 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 such as *Leptospirosis*. This kind of hazard is common in marginalized neighbourhoods in São Paulo, particularly during the summer rainfalls.

The final community map (Figure 3) points out areas under risk from landslides and flooding, localized environmental impacts (such as irregular garbage deposits, sewage discharge, storm water emission, leaking fluids coming out of the landfill), as well as areas lacking basic infrastructure, and public facilities. It also shows drainage

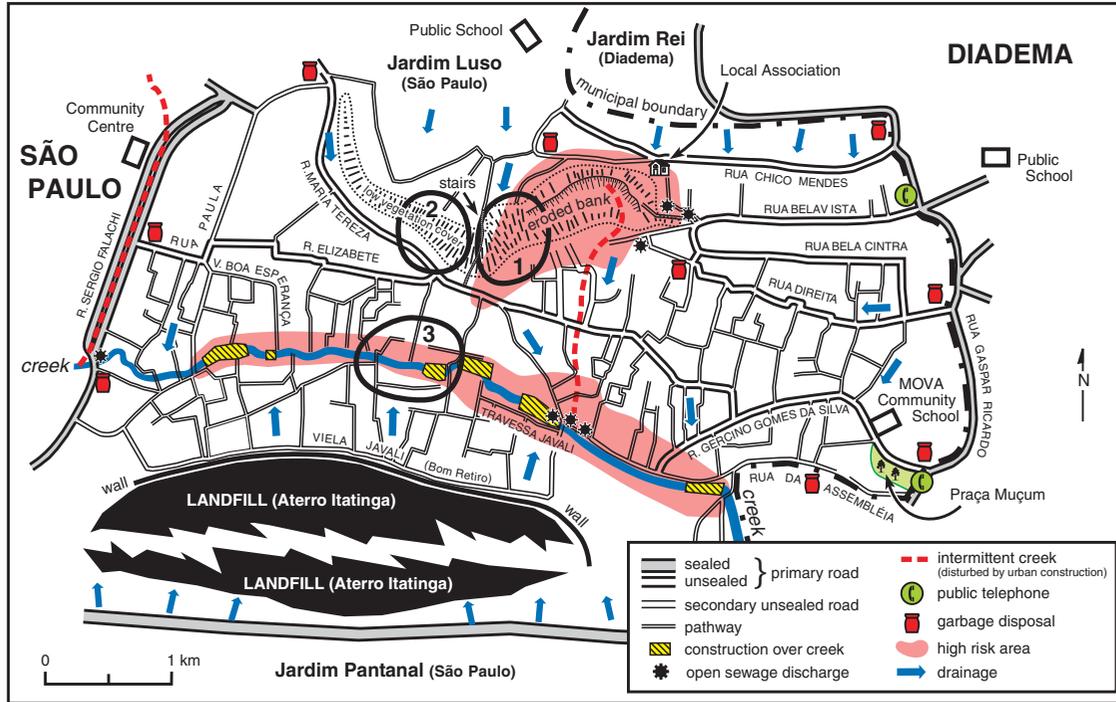


Figure 3. Mapping risks, hazards, and assets in *Pedra sobre Pedra*. Source: Jütta Gutberlet (2008).

flows, following slope orientation and it indicates the likeliness of soil erosion along the unpaved pathways.

Until 1999, the majority of the dwellers in *Pedra sobre Pedra* accessed drinking water (94.7%) and electricity (95.5%) illegally through neighbouring settlements, 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 and household waste was dumped on open land, into creeks, or was deposited at the exit of the settlement, where it would be collected regularly through the serviced neighbourhoods. As a consequence, garbage piled up at the intersections between squatter settlement and the outside world.

Shortly after the *ProSanear* project

In 2001 the squatter settlements surrounding the *Itatinga* landfill were included in the *ProSanear* water supply and sanitation project (Grupo Técnico de Apoio, 1999). The project aimed to bring formal water supply and sewage collection to each household and to collect rainwater in order to control flooding of the creeks. In consultation with the local residents, select houses

were removed in order to widen alleys and allow installation of sewage and storm water drains. All of the alleys were cemented to prevent erosion and the main creek that ran through the community was canalized. The location of the creek was turned into the community's main access road (see area 3 in Figure 3). Finally, a portion of the most hazardous slope was covered in cement to prevent further erosion and landslides (see areas 1 and 2 in Figure 3). The following illustration shows the risk area in the background (Figure 4).

A second research project was initiated in 2003 to document the immediate impacts to the community as a result of the *ProSanear* project. Once again the *Pedra sobre Pedra* community association was involved in the design and implementation of the research project. A stratified random sampling technique was used to select 44 households within the community to participate in a semi-structured in-depth interview regarding the upgrading project. Houses were selected from alleyways ($n=11$), the new main road ($n=11$), and minor roads ($n=22$). The questionnaire aimed to understand how the day-to-day lives of the residents were affected by regular formal access to water and sanitation. Residents were asked about their current residence and if they had



Figure 4. View facing north towards part of the risk area. *Source:* Jütta Gutberlet (2008).

made any investments to physically improve their house since the project. Finally, residents were asked about changes to the community as a whole and about their vision for the future of the settlement.

Initial response to the *ProSaneam* project was positive. Several residents stated that they had doubted the project would happen because they have little confidence in political promises. Despite having to pay a minimum charge for water supply, most households felt that they could afford these costs and only three households admitted that the cost was too high and that they continued to steal water. Having a water bill was presented as a sense of pride. Residents felt that their existence was being recognized and that now they had a proof of residence that they could show potential employers.

Women were the most positively impacted by having regular access to water at home. Previously, most households had some access to water illegally tapped from the local water supply. Several women spoke of having to wake up early in the morning to fill water buckets while there was enough water pressure in the tap. After households were officially connected to the city, shortages in water supply were rare. As well, legally accessing water gave residents a sense of

security because they had the ability to phone *Sabesp* and make a formal complaint if they had problems with their water.

When asked to describe their lives before the project, residents frequently spoke of flooding, either in their neighbor's house or their own. A common answer was 'it used to smell and there were rats'. People remember the mud they used to walk through and the garbage in the streets. 'There was a lot of overpowering smell, it was horrible, intolerable' commented one woman. Cementing the alleys made them easier to walk through than slippery wet mud. Storm drains and channelling of the creek also eliminated the sewage mixed floods in the community.

The main access road that was created brought several changes to the neighbourhood. Residents positively noted an increased police presence in the community, which gave them a greater sense of security. Ambulances, school buses, and unofficial buses began to enter, and a garbage truck was able to start regular collection. Whereas houses along the creek used to be undesirable because of the smell and flooding, new additions and improvements to houses are noticeable now that they were on the main road. Of the 12 residents surveyed on this road, four moved to the road since it was completed from different

locations in the neighbourhood. Of the seven households that were living there before the road was built, five had invested in improving the structure of their house and indicated that they would not have done so if the road had not been built. One person did not respond to the question and one had not invested in improvements due to lack of funds. Finally, a few businesses were started on the street such as an electronics repair shop, a bakery, and a bar.

Investment in house improvements and changes were seen in other parts of the community as well. A total of 10 households out of 32 located on a minor road or alleyway had made improvements in the previous year with one non-respondent. Eight households had lived in their home for less than 1 year and five of these moved from outside of the neighbourhood. A total count of households in the community was not conducted, but the vertical expansion of houses was visible.

Four major needs and desires were identified by the community: improved access to health services, paving the roads, access to public daycare, and access to skills-based education. The community's lack of access health services is directly linked to their lack of postal address. The settlement is close to two health centres, one within the municipality of São Paulo and the other within the municipality of Diadema. The community residents do not have an official street address and their proximity to the municipal boundary often leaves them in limbo between the two health centres. Neither centre willingly accepts these residents and they claim that the residents live within the other municipality. When viewed on a map the community is literally depicted as a large white space. The impression given is that the area is empty. As no roads are officially recognized by the city the community goes unnoticed to the outside world.

Upon review of the five quality-of-life indicators outlined by residents in the first research project, risks and hazards, basic infrastructure, public services, and housing had all improved as a direct result of the *ProSaneam* project. However, the fifth indicator, green spaces, had actually been reduced for two reasons. The largest reduction in green space was due to the installation of a cement cap over 1/3 of the most precarious embankment to prevent further erosion (see area 1 in Figure 3).

Further impact on green space was the result of increased encroachment of housing on steep slopes that were previously undeveloped. While the *ProSaneam* project provided immediate benefits to quality of life, it was not enough on its own to overcome the social exclusion faced by the residents. Several elements of social exclusion, which were overshadowed by the need for basic services, are brought to the forefront in the third study.

Four years after *ProSaneam*

In 2007 a third study was conducted to explore some of the elements of social exclusion identified in the previous studies and to document new developments within the community. Qualitative unstructured interviews were held with community leaders to learn about their community-led initiatives. A structured survey of 130 households ($n=88$ on roads, $n=42$ in alleys) and an open street meeting were also carried out with the aid of the community association. The survey questions aimed to identify ongoing community needs and key elements of social exclusion, which continue to marginalize the community residents.

Between 2003 and 2007, the community received further infrastructure improvements. *ElectroPaulo*, the local electrical company, installed streetlights on the roads and in the alleys. Residential electrical meter boxes had just been installed in residential homes at the time of the study and not all residents had received their first bill. Also, all of the roads had been paved. Official buses began to enter sections of the community and a number of new businesses had also opened along the major and minor roads. The provision of the community's most basic physical needs had been met. As a result, previously overshadowed elements of social exclusion were brought to light.

The community's lack of a postal address, reflecting lack of land ownership, contributes to sustaining each of the remaining barriers that continue to hinder the evolution of the *Pedra sobre Pedra* settlement into an official neighbourhood that appears on city maps. The barriers created by the community's lack of a postal address and land ownership were not prominently identified in the second study largely because residents believed their water bill was a sure sign that an address and land title would closely follow. Unfortunately



water and electricity bills can be hand delivered by meter readers and thus a postal address is not needed. A postal address is needed, however, to register for a telephone line, to receive personal mail, and most importantly to register to vote.

Longer term residents to São Paulo and Diadema areas have managed to work around the address barrier by using the addresses of friends and family. Personal mail is collected from time to time and cell phones are used instead of residential lines. For new residents without established social networks, the option exists to pay for a postal box if they can afford one. Residents who cannot afford to purchase and maintain a cell phone are restricted to using pay-phones located outside the community (see Figure 2), which, however, are often out of service and do not receive calls. Inability to access phone service reduces a person's ability to search for work as employers require contact information.

Previously unrecognized as a problem, the use of alternate addresses to register for voting right has reduced the community's political influence. While they all technically live in the municipality of São Paulo, only 60 residents reported that they vote in São Paulo. Forty-nine residents vote in Diadema, 19 vote in other municipalities or do not vote, and two did not respond. This division reflects the confusion that surrounds the community's place within the city. The community association has been unable to discover who owns the land they live on. The city has not included local residents in negotiations with the landowner, although they do claim to be trying to obtain land rights. Attempts by the community association to lead improvement initiatives in partnership with the municipality of São Paulo have not been successful to date due to the lack of local land ownership.

A non-profit daycare centre is an example of one of these initiatives. Located on the edge of the community closest to the municipal divide, a small house was acquired for use as a daycare for employed mothers. Community members saw that mothers were having to choose between leaving their children at home alone or not taking job opportunities. In an effort to address this problem, a group of residents formed a non-profit daycare run entirely by volunteers and donations from the community. Up to 60 children can be cared for at one time, and adult literacy classes

and youth activities are being run out of the centre on evenings and weekends (Figure 5).

This daycare was never meant to be a long-term solution to the community's childcare needs. The intended goal of opening the centre was to show the municipality that there is a significant need for childcare in the community and to form a partnership with the municipality for funds to run the centre. While the municipality has indicated that funds are available for a daycare, the centre has not been able to officially access the funds because they do not formally own the land. Attempts at finding the official landowner have been discouraged for fear that the owner may try to take back the land and displace the community. Despite considerable investment in water, sanitation, and electrical infrastructure, the local residents are still presented with the fear of losing their homes.

Another community-led attempt to improve the neighbourhood was initiated before the first research project began. The neighbourhood association proposed the creation of a park and a plant nursery, a community garden, and a centre for environmental education within the open space below the steep embankment (see area 2 in Figure 2). Six years have now passed and none of the proposals were implemented. Over these past years, the area was occupied illegally twice by homeless and each time the government paid a compensation for the removal. The local leaders interviewed in August 2007 explained that the level of poverty and housing necessity prompts such behaviour of taking advantage of the compensation payments. Today, most dwellings hold at least two and up to five floors to accommodate new family members or to provide an opportunity to earn from renting out.

Formal instruments for government and citizens' action

Important changes in urban development are underway with the *Estatuto da Cidade* (City Act), based on a federal law enacted by the National Congress (Law No. 10,257/2001) and the Municipal Law No. 15 547/1991 (Brazil, 2001; Bassul, 2002). This act proposes participatory decision-making strategies in order for representatives from the civil society to partake in the elaboration and implementation of urban development plans, programmes and projects (Article 20.II). The City



Figure 5. Child care unit directed by Mr Nascimento leader of the NGO *Associação Amor e Vida*. Source: Jütta Gutberlet (2008).

Act further provides opportunity for legitimized participation from the community, through neighbourhood or community associations and environmental NGOs (Article 50). It also stimulates citizens to initiate public action through the Public Ministry where collective rights are infringed. Neighbourhood associations, which have a mandate for environmental protection, for example, can thus take an active role in urban planning. Participation in the implementation of urban policies is further facilitated by way of public hearings and the promotion of open debates. There are also procedural juridical instruments that assist the state in any necessary intervention against violations to the principles of urban development. The Act allows for legal usage of taxation or even expropriation (Brazil, 2001; Meneguello, 2002). In theory, 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. To what extent these participatory policy approaches of the City Act have the potential for enhancing social mobilization and addressing pressing issues of social housing and quality of life in underprivileged neighbourhoods has yet to be seen.

In 2002, the council of São Paulo enacted the city's long awaited *Plano Diretor* (Master Plan). This

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, p. 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) recover urban environmental quality; (5) transfer funds from developers to public projects; and (6) strengthen the public sector initiative and planning (Brazil, 2001, p. 40). The plan and the City Act provide new opportunities for correcting the disparities in urban development between core and peripheral areas, and for implementing actions that can enhance urban liveability and sustainability in all parts of the city.

The Master Plan and City Act have succeeded in including *Pedra sobre Pedra* city projects. Ongoing social exclusion, however, has limited the community's ability to participate. One example is a community greening initiative that provides trees to community associations. The *Pedra sobre Pedra* community association has been accepted as a partner and plans to initiate an adopt-a-tree project with local residents. A major question they have been unable to answer is where there is room in the community to actually plant the trees. Unless the municipality is willing to pay-off and



remove houses, the only green space within the neighbourhood is on the steep embankments where houses cannot be built (see areas 2 and 3 in Figure 3). In order to achieve solidarity with excluded communities and to recover urban environmental quality municipalities need to move beyond planning to actually doing and enforcing their plans with community collaboration.

Conclusions

Empowerment: a path towards inclusion

With growing rates of impoverishment in recent years, squatting has become a widespread social and environmental problem in most large cities in the developing world. Major driving forces for this expansion of irregular squatter settlements at the urban fringe are social exclusion, lack of proactive social housing policies, and land speculation. The often unemployed or underemployed marginalized population lacks resources to rent or buy property and thus become illegal squatters. The research shows that at the periphery of São Paulo this population lives confined under unhealthy, risk-prone and crowded living conditions.

Environmental education and awareness are generally low among the marginalized population. High intra-urban mobility, insecure land tenure, and fear of eviction hinder the formation of sense of place among the new squatters and the building of social cohesion becomes more difficult (Bimal Kanti, 2006). The cost of squatting is high, as it results in land degradation and contamination and often provides the conditions for the diffusion of disease (eg Leptospirosis or Dengue fever), and property loss following disasters (landslides and flooding). The expenses of reparation and mitigation of direct and cumulative impacts, as well as the costs related to permanent loss of environmental assets, are not accounted for.

The *ProSanear* project implemented in *Pedra sobre Pedra* brought immediate benefits to the community in the form of regular access to clean water and sanitation, the elimination of flooding and an increased sense of inclusion as official city residents. Subsequent improvements included official access to electricity, and improved road access, which allowed garbage collection, ambulance, police, school bus and city buses to enter the community. Despite these major physical

improvements, the community remains socially excluded due to their lack of land tenure and for some lack of postal address. Without land tenure, residents cannot access basic services such as home telephone service. Lack of a postal address also forces residents to register to vote with the address of a friend or relative. As a result, the community's political influence is split as residents primarily vote in two different municipalities.

The case study has uncovered the government's omissions for decades in providing responsible urban development in the city's periphery. Only in 2000, the new municipal government took first steps in response to this crisis. The official discourse recognizes the necessity of preventive and pro-active measures to protect watersheds and to tackle the social crisis. The Municipal Government has begun with the construction of Integrated Educational Centers (CEUs), the expansion of basic infrastructure (primarily drinking water distribution and sewage collection) and new programmes providing the opportunity to generate employment. The first CEU was constructed in *Cidade Ademar/Pedreira* in the *Billings* watershed. The purpose of these centres was to provide educational and recreational infrastructure to the periphery. Despite these initiatives there is still widespread consensus among the interviewed community in *Pedra sobre Pedra* that the implementation 'takes far too long' and that 'the results have not yet been widely felt' at their grassroots level (August 2007).

Participatory, bottom-up development strategies raise crucial questions of: Who determines? Who decides? Who applies these rules? It is the responsibility of local governments to provide the grounds for the communities to participate in the assessment and implementation of measures that will tackle their needs. It is also an obligation of the global community to address this situation of deprivation and to change the structures and procedures that generate uneven development. Debt relief, fair trade, equitable trading conditions, access to micro-credit schemes, appropriate technology, and other social economy initiatives are equally important as deliberative democracy in promoting local community development.

The present results confirm that the difficulty in accessing funding and information is one of the main hindrances for community development. It is very complicated for a neighbourhood



association to implement self-help measures, and it requires endless persistence and resilience to access funding or public resources and most often this results in unsuccessful endeavours. The neighbourhood association *Pedra sobre Pedra*, struggled for years to access funding and to receive support in the implementation of local development initiatives. These experiences underline the importance of involving locals in the research learning process.

Participatory appraisal and mapping provide local leaders with instruments that can empower their community. This research aimed at generating knowledge for the community, through providing them with the findings and by disseminating the results to the wider community, drawing the attention of the government to their precarious living conditions. The initial participatory fieldwork was finalized with a general assembly, to which local authorities and NGO representatives were invited, providing an opportunity to communicate the research results and to receive local feedback. A seminar discussing the research findings was also organized with representatives from the São Paulo government and with local groups. This phase of the research process was imperative in stimulating grassroots mobilization and action. Despite the energy generated, little has happened due to lack of political support.

It is well known and documented that bottom-up approaches are often more time-consuming, complicated, and sometimes even less efficient in their implementation than top-down strategies (Zwart, 2003). It has also been widely documented that community-oriented approaches are not always as equitable as they should be (Carley, 2001). Grassroots approaches demand extensive negotiations and partnerships, sometimes even among different political parties. There is no single general answer as to how to attain more livability and greater urban sustainability; however, the focus needs to be on long lasting, widely accepted, inclusive, and locally appropriate resolutions, using local assets and capacities, minimizing degradation and waste of resources. Governments can provide the necessary conditions for opening up dialog, participation, and transparency. Public hearings, general assemblies, and participative councils, as well as the strengthening of associations and cooperatives, bear the potential of producing sustainable urban devel-

opment. Finally, urban movements and grassroots initiatives are important in empowering socially excluded citizens and in challenging current development in favour of inclusive planning and decision making that improve overall sustainability (Carley and Smith, 2001).

A paradigm shift is necessary to attain long-term growth in quality. It needs to be based on sustainable and resource-aware production and consumption models that are grounded in the internalization of environmental and social costs. Development needs to undergo a paradigm shift from a quantitative to a qualitative conception, building sustainable communities. Interactive learning and community-based approaches are prerequisites for effective change towards increased sustainability and liveability on a long-term basis.

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