

The São Paulo's Metropolitan rural area: environmental protection and urban expansion<sup>1</sup>.

Yara M. C. de Carvalho<sup>2</sup>; Terezinha J. F. Franca<sup>2</sup>; Vilma Barban<sup>3</sup>; M. Carlota M. Vicente<sup>2</sup> ;  
Vera Lúcia F.S.Franco<sup>2</sup>

Abstract:

Agriculture in the São Paulo's Metropolitan area was strongly stimulated, through public policy, to guarantee food supply. This reality has changed in the last three decades when it has been left to its own fate.

There is still a strong commercial agriculture with high technological standards. The activity resists to violence and the disorganized urban growth. The countries' income inequality, the city's economic attraction and the actual situation of high unemployment and low income are associated to the pattern.

The increasing water scarcity is creating a new perspective for environmental protection participation parallel to an increasing concern with poverty and unemployment that is stimulating new low income housing and an urban agriculture social movement. This sets the question: Are the environmental and social movements capable of redefining the disorganized trend of urban expansion? Through evidences from field research it is argued that there are some signs of articulation, only sufficient to show how it can be enhanced.

### **1. Historical perspective : the Metropolitan area and the watershed of Alto Tietê**

The Portuguese crown, through Martin Afonso de Souza in 1532, understood the possibility of creating the first settlement on the highland, away from the Atlantic Sea. This isolation defined a particular pattern of social organization and development. The Jesuits founded São Paulo's village, in 1554. Jesuits and secular population had a contradictory relation with Indians. This defined a pattern of land occupation with several Indian villages scattered around the Monastery. Large areas were granted to those with means to exploit it. This also led to have farms scattered through the area. There was also some common land available for free and poor families' use, besides the remaining land to be granted by the provincial government. Life description during this period demonstrates integration among what is today called the Metropolitan Region of São Paulo-RMSP, or Alto Tietê watershed as a sign of how natural resources determined this community life configuration.

The population was mainly Portuguese and Spanish man, Indian woman, besides Africans and pure Indians. There was a clear mixing race policy at the time. In the last decades, of the XVII century, the practiced agriculture was declining everywhere. Most of the population spoke the « general language<sup>4</sup> » and the diet was strongly influenced by Indian habits (TAUNAY, 2003).

The development of the mining activity in Minas Gerais became the main economic alternative for Brazil, during the XVIII. It stimulated the population movement towards

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<sup>2</sup> Researcher Instituto de Economia Agrícola.. Av. Miguel Stefano, 3900. 04301-903. São Paulo, Brazil

<sup>3</sup> Researcher. Instituto Polis. R. Araujo, 124. 01220-020. São Paulo, Brazil

<sup>4</sup> Portuguese spoken by Indians.

Jundiaí and Guarulhos and changed the population pattern by European immigration and transference of Africans and Afro-Brazilian slaves. During this period, the Provincial Government had a special concern guaranteeing food supply to São Paulo.

Santo Amaro, today a neighborhood in São Paulo, was first an Indian settlement. It became an agriculture area and its role as São Paulo' food belt was consolidated when, in 1827, received the first European immigrants : Germans. They received land and a subsistence grant for three years . (Album de Santo Amaro: s/ data).

By mid nineteenth century, coffee has entered from Rio de Janeiro through the Paraíba Valley and, from there, gradually to all State. The slavery abolition and the need for rapid and efficient transport were the two main challenges for the coffee development. Only in 1856 was given the concession to exploit the Santos-Jundiaí Railroad. Serra do Mar, the obstacle, was overcome opening the high lands to scale agricultural production.

Immigration became the strategy to substitute slaves in monoculture large-scale production. During the empire and the first years of the Republic there was a dispute between two opposite views, with direct effect on the Brazilian model of society : small farm production or workers for large-scale farms. Martins (2002), in his history from the dominated class' perspective considers that the motivation for organizing the settlements<sup>5</sup> was to build a new model of society and another political regime : the republican. The São Caetano settlement was crossed by the Santos-Jundiaí railroad. Shortly after, its “main function was not to promote colonization and family farm development but attract European migration to the São Paulo Province.”

Nevertheless, there was an efficient policy designed to promote colonization and agricultural production. It was launched a public health program to free the frontier from endemic diseases, geologic and geographic study for planning colonization scientifically and agronomic research institutions to give support to farmers. The immigrants came to work in coffee farms but their interest was land.

The disruption of the large scale monoculture system of production was: the soil exhaustion by coffee production; the life cycle of coffee trees; the sustained government price and surplus production and the financial crisis of 1929. In areas close to São Paulo, coffee had been introduced in the last decades of the XIX century. Coffee trees last around 40 years. The financial global crisis found these areas with very low productivity and farmers were forced or willing to sell their land to immigrants. It also contributed the fact that market proximity and the evolution of urban life style in São Paulo attracted buyers, mainly Japanese in RMSP. Immigration had a double effect that shaped the São Paulo society : provided working force for rural and urban opportunities and a modernizing ideology that came to forge the labor movement (CARONE, 2000).

The coffee boom of the XIX and beginning of the XX century stimulated export trade and created the financial and market conditions to stimulate investment in an industry oriented to low quality production. The urban aspects of the city had changed drastically and a successful commercial middle class composed by migrants or natives, and an increasing labor force for industry constituted a stimulating fresh food market for the small agriculture farmers in RMSP. This coffee elite will try to reproduce the European life style crafting social disintegration.

Through the period until the end of World War II, industry was being developed, stimulated by the disruption of international market. After this period, the argument of

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<sup>5</sup> São Bernardo, São Caetano, Glória e Santana, in 1877

infant industry and the « Process of Import Substitution » consolidated this development, as a public policy. São Paulo's leading industrial position in Brazil attracted blue collars migrants, seeking for better job opportunities. This can be seen in table 1. It is evident the importance of the years 1940 and 50, when the rate of population growth are higher.

Another impact was the « modernization of agriculture ». During the 60's, the process started based in imported inputs. During the seventies this inputs became nationally produced and its use promoted an increasing process of land concentration and urbanization that gradually and constantly, spreads over the country. Table 2 shows the evolution for Brazil and emphasizes that in the 70's occurred the turning point , urban population exceeding rural.

Table 1 : Annual rate of population growth in São Paulo

Year	Population	Annual rate growth
1827	25471	
1837	30000	1,65
1850	30000	0,00
1890	240000	5,34
1900	239920	0,00
1910	375439	4,58
1920	587072	4,57
1930	887810	4,22
1940	1326261	4,10
1950	2198096	5,18
1960	3781446	5,58
1970	5885475	4,52
1980	8475380	3,71
1990	9512545	1,16
2000	10398576	0,89

Source : CARONE (2001); SEADE-Perfil Municipal (captured, April, 2004)

Table 2 : Urban and rural population in Brazil

Condition of residence	1940	1960	1970	1980	1990	1996	2000
Urban	30	45	55	68	76	78	81
Rural	70	55	45	32	24	22	18

Source : IBGE-Censo Demográfico (captured, April, 2004)

Brazilian economy is characterized by a strong income inequality, one of the largest in the world. Based on the annual world analysis from PNUD, in the year 2000, it can be stated that the richest 20% of the population received 25,5 times the income received by the 20% poorest. This meant that the first group received 63,8% of national income while the latter just 2,5%.

Until the forties, low-income housing was concentrated in downtown with several families sharing a home called "cortiços". Later, a market speculative movement was developed to promote low income housing, far from the city, without infrastructure and urban equipment. The new residents later pressured the public sector for these services. The social and economical inequality, enhanced after the seventies, created empty spaces in downtown, through rising prices of housing.

The lack of a Metropolitan housing policy and particularly, after the nineties, with the increasing unemployment and decreasing investment in social policies, the poorest population is being forced to move to the outskirts of the city, pressuring even more the protected environment. The development of the high-income service sector in Santo Amaro, close to Guarapiranga, created a local demographic pressure added to the general forces. There is an estimation that in 1996 more than a million people lived in watershed protected areas, without urban infrastructure. This number is continuously increasing.

The large rate of population growth, particularly in the RMSP, the large income inequality, the lack of urban policy and the cheap transportation facilities: roads and railroads, are main factors to explain the disorganized pattern of urban expansion in RMSP. The complexity of origins, cultures and background creates small homogeneous islands of those who seek for better life and bring families and relatives to the new town. It is this complex society that characterizes the RMSP. It RMSP has today 18 million inhabitants and occupy an area of 8051 km<sup>2</sup>, from which 37 % is urban.

Despite the fact that water is abundant in RMSP, the increase in urban population defined a situation of great scarcity. In 1972, it was formulated a county law defining land use and occupation, imposing restriction to its use and establishing indexes of demographic density. The state law to protect the drinking water supply watershed is from 1976 (Laws 898/75 e 1172/76) and a state system was developed through the years.

When the Federal Law 9.433/97 established the National Managing System of Water Resources a whole system was already in operation and had to be adapted. The new law has as its main principles that water is a public good, a limited natural resource with an economic value, which shall be used primarily for human and animal consumption. Management should consider multiple uses, decentralization and participatory process of decision. The watershed is the territorial unit for management policy of water resources (PRETTE, 2000, p. 139). The water committees are tri-partite. The social representation is not from the productive sector but from social movements that are just starting to incorporate the environmental concern.

The new State Law 9.866/97 establishes the new model within the State of São Paulo. The watershed Alto Tietê is roughly equivalent to the RMSP. It is composed of 5 sub-watersheds with independent Water Management Committees: Billings, Guarapiranga, Pinheiros-Pirapora, Cantareira and Cabeceiras.

This study will consider particularly Guarapiranga and Cabeceiras.

## **2. Objective**

This paper is a first attempt to evaluate if the environmental movement's recent evolution and general environmental concern are influencing social movements in order to alter the pattern of rural land use in RMSP. The social and economic characteristics of the Brazilian development model are important defining factors and there is no sign that a substantial change is occurring. It remains relevant to evaluate the effort of counter action realized by the environmental movement and its effort in crafting social organizations to enhance a new relation man and nature.

The specific objectives are to analyze the environmental concerns of different actors living, working or enjoying the rural habitat in RMSP: social and environmental movements, urban residents; farmers and second house owners. These considerations are a subsidy for the research and action project in the area.

### **3. Methodology**

This paper is a sub-product of a larger project that is looking at the negotiation between water; urban conditions and agriculture, in the RMSP. Considering the area size, the chosen strategy was to select the two most important water supply watersheds to São Paulo : Guarapiranga and Cabeceiras do Alto Tietê. In each region was selected a sub-catchment to concentrate fieldwork : Parelheiros in São Paulo and Balainho in Suzano, in each watershed, respectively. In terms of fieldwork in urban agriculture it was also considered Guaracau in Guarulhos, part of Cabeceiras. Analyzed information was obtained by a closed question questionnaire.

The statistical data was taken from a census realized during the agriculture year 1995-96, by Secretaria de Agricultura e Abastecimento do Estado de São Paulo (PINO, 1997). The analyzes considered the geographic boundaries of the watersheds.

The social and environmental organizations were identified by the « snow ball » technique where one organization leads to the others. Each one was subject to an interview. The main purpose was to identify how does environmental organizations integrate with social movements and if there was a strong social movement (including environmental) capable of influencing the development pattern of occupation.

Urban agriculture and secondary homes were identified in the field by an exploratory strategy that started with a territorial division under the assumption that proximity to urban areas and violence were important factors to be considered in the analyses. A field identification of the universe to be researched was gradually crafted as interviews led to a pre-typology. Periodical review of the pre-typology and what units remained to be interviewed determined the sample size.

Urban agriculture analyzed was market oriented, despite the fact that there is a strong urban agriculture realized as complementary to another activity. There were 29 interviews realized in Balainho; 28 in Guaracau and 21 in Parelheiros. It was realized an inquiry in no less than 25% of the universe covering at least 3 farms of all different systems of production.

Tourism was oriented to study secondary residences. According to “Dicionário de Geografia Humana (JOHNSTON, 1989:302)” mentioned by TULIK (2001:07), secondary residence is a “property that may be owned, rented or long term leased by a family which their main residence is elsewhere; this property, usually located on rural areas is used for leisure purposes”. It was realized 13 interviews in Parelheiros and 18 in Balainho.

The environmental awareness of farmers, urban dweller organizations and secondary house owners will be considered in three perspectives:

- a) perception of the direct effect, through changes in environment affecting them: water quality and availability; land use (urban proximity, violence , other uses);
- b) behavior change observed through introduction of new technological (irrigation, water source) or family practices (recycling and saving natural resources);
- c) knowledge about law implementation and participation in managing committee.

### **4. Rural land use : agriculture**

The dynamics of periurban land market is well known. Farmers pressured by violence and other urban externalities, face land price increase and tend to sell his property abandoning the activity or just moving to another area. Agricultural land becomes second or first house. This process is active in all RMSP. Municipalities have different approaches to this problem. In some cases, all area has been legally defined as urban and become

subject to county law and taxation: IPTU. In others, the area remains rural and subject to federal legislation and taxation: ITR. In these cases, it is more likely that political leaders with electoral purposes support illegal urban occupation.

The public transport policy is an important aspect to explain urbanization. The Guarapiranga watershed has been lacking public investment in this sector, partly because it was considered an important strategy to refrain urban expansion.. This partly explain why Grajaú, in Billings reservoir, not a drinking water supply dam, grew faster during the seventies and eighties. In the nineties transportation is improving in Parelheiros and it is receiving a greater demographic pressure. Cabeceiras has three main transport influences: the federal railroad, the main road in Vale do Paraíba: Dutra and the last is the Tibiriça Indian road connecting the industrial municipalities known as ABCD<sup>6</sup> with the region. During the seventies, industries developed around the roads and urban developments expanded. A complex transport system connected even isolated urban areas with São Paulo and other cities, defining these municipalities as dormitory cities.

There is now a discussion about building a beltway that will affect both areas. The process was contested by environmental organizations due to the impact over preserved areas. It is under re-discussion and is stimulating the land market.

The watershed Alto Tietê Cabeceiras, includes partially or entirely, 9 counties: Guarulhos, Arujá, Itaquacetuba, Ferraz de Vasconcelos, Suzano, Mogi das Cruzes, Biritiba Mirim, Salesópolis and Paraibuna where there are 780 units of agricultural production (UPA). The total area is 19.833,4 ha, of which 24,7% is natural vegetation; 21,8% reforestation; 27,8% natural and cultivated pasture; 9,6% annual crops and the remaining with other occupations (perennial; semi-perennial, not used and not usable or with infrastructure). The smaller properties until 10,0 ha add to 481 units (61,7%), occupying an area of 2.155,0 ha (10,9%). Above 50,0 ha, it was registered 66 units (8,5%) with a corresponding area of 13.067,7 ha (65,9%). Soil occupation is influenced by size. In areas under 15,0 ha there is a predominance of annual crops while in the largest ones prevails pasture and reforestation. Natural vegetation represents 10,1% of the total area in UPAs up to 2,0 ha and 28,6% in those above 50ha.

Considering the agricultural technological process, around 50% of total UPAs use organic fertilizer, 47,2% use improved seeds; 44,6% correct the pH; 20,8% make soil laboratory analyses; 30,8% adopt conservation techniques and 13,7% does protected cultivation. Cattle raising technology includes vermifugation in only 14% of total UPAs where the activity exist, and mineralization in 11,5%. It is important to stress that in properties with more than 50 ha, this practices increase to 53,0% and 47,0%, respectively suggesting a better technology.

Employment in agriculture absorbed 3.581 people in 1995-96. They are mainly full time workers, including also those who work as partners (43,8%). Landowners and their family represent 29,4%, seasonal workers 18,3%, tenants 5,8% and agrarian reform settlers 2,5%.

In the Balainho watershed, where the field work was concentrated, it was registered 115 UPAs, around 14% of the total encountered in the 9 counties of Alto Tietê, but only 8,66% in terms of area. Around 50% has less than 10,0 ha and occupy 19,1% of total agriculture area. This indicates that the watershed has similarities with the land distribution pattern of Cabeceiras, but with less concentration since there is proportionally less

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<sup>6</sup> Santo André, São Bernardo, São Caetano e Diadema nest of the automobile industries.

properties smaller than 10 ha and they occupy a larger percentage of the total area. In the other extreme, there is also a smaller percentage of large properties (5% compared to 8,5%) occupying a smaller area (4,3% to 65,9%). It is mainly annual crop, horticulture, but there is also reforestation. Together they represent 64,3% of total area, much more representative than for the whole area (31,4%)

In general, Balainho watershed has a technical performance superior to the average of the 9 counties. A larger number of UPAs does soil conservation (87,8%), correct pH and use improved seeds (69,6%); 60,9% use organic manure; 23,5% does soil laboratory analyses and 21,7% protected cultivation.

Cattle raising is not an important activity in Balainho what can be seen by the low percentage of pasture land and the smaller size of properties engaged in this activity (less than 15 ha). The use of vermifuge and minerals is superior (18%) to the average realized in the region 14 and 11,5%, respectively, but much inferior of what is practiced in the largest properties in Cabeceiras.

Employment's composition in Balainho shows a relatively smaller importance of family farmers and consequently a larger importance of wage labor than in Cabeceiras. Nevertheless, the relative importance of each category is the same.

Balainho represents 14,74% of Cabeceira's UPAs and 8,66% of agricultural land and 22,64% of total watershed agricultural labor force occupation.

In the watershed Guarapiranga, the counties considered are São Paulo, Embu-Guaçu; Itapecerica da Serra; Jujuitiba; São Lourenço da Serra; Cotia e Embu. It was identified 191 UPAs with a total area of 3602,4 ha. Comparing the two watersheds Guarapiranga has 24% of UPAs and 18% of agricultural land of what has been identified in Alto Tietê Cabeceiras. This indicates different importance of agriculture in both regions.

In Guarapiranga, the agricultural activity is mainly annual crops (28,3%); followed by natural vegetation (23,3%); natural and cultivated pasture (15%), reforestation 4,2%. The remaining is used under others land use categories. Comparing to Cabeceiras, natural vegetation has a similar importance but annual crops are relatively more important in Guarapiranga. Pasture and reforestation have a very limited significance in this region.

Land distribution is characterized by 37,0% of UPAs below 5,0 ha (70 units) occupying an area of 192,7 ha equivalent to 5,3% of total. Above 50,0 ha it has been registered only 8 units (4,2%) with a total area of 1487,1 ha (41,3%), demonstrating that land concentration is less in this watershed. Horticulture is here the main activity at all property sizes but larger properties have larger reforestation and pasture areas.

The best practices in agriculture are characteristic of all properties, with no regard to size. Organic manure and improved seeds are used in 90,6% of total UPAs; soil conservation (89,0%); pH correction (84,8%); soil analysis (37,7%) and protected cultivation (35,08%) are practiced. All indexes show a more technological agriculture in Guarapiranga than in Cabeceiras or Balainho. Animal breeding adopts vermifugation and mineralization in 13,1% of total UPAs.

Considering employment, there was 1.439 people directly occupied in agriculture, in the agricultural year of 1995-1996. They were mainly full time workers (34,0%) including those developing the activity in partnership. Landowners and their families represent 29,4%; seasonal workers 25,7%, tenants 10,6% and land reform settlers 0,5%. Comparing to Cabeceiras and Balainho, Guarapiranga has more seasonal workers and tenants and less full time workers. The presence of tenants is strongly associated with the fact that agricultural land has high value because inspection is efficient. Agricultural land is

given free in exchange for maintaining it open. In some cases, it is used with no contract with landowner. This suggests that maybe it would be possible to stimulate commercial agriculture in the region, if selected areas were made available.

The Parelheiros watershed was selected for fieldwork in Guarapiranga. It is located in São Paulo County and has 56 units of agriculture production (UPAs). UPAs vary from 0,2 to 121,0 ha, adding to 950,8 ha. Parelheiros accounts for 29,3% of all existent units in Guarapiranga and 26,37% of total cultivated land and 32,3% of agricultural occupation.

The units of less than 5 ha represent 37,5% and occupy an area of 6,21% while the largest units (above 50ha) represents 3,57% of total units and 22,90% of agricultural land. This indicates that land distribution in Parelheiros is somewhat less concentrated than in Guarapiranga as a whole, and consequently than Balainho and Cabeceiras. Parelheiros has a relatively higher concentration of annual crops (40%) and natural vegetation (32,80%) of total land use, than Guarapiranga.

Farmers in Parelheiros use modern sustainable technology : organic manure (98,2%); soil conservation practices (94,6%) pH correction (96,4); improved seeds (83,9%); soil laboratory analyses 28,6% and protected cultivation (35,7%). In general, Parelheiros has a more technical pattern than Guarapiranga. There are two exceptions : improved seeds and soil analyses, but even better than Cabeceiras and Balainho. Only 8,9% of cattle farms works with vermifuges and mineralization.

During the harvesting year 1995-96, 465 people were occupied in agriculture. Full time workers represented 31,2%, landowners, their families and partners were 27,7%; tenants 26,5%, seasonal workers 14,4% and land reform settlers 0,21%. The main difference in relation to Guarapiranga is that Parelheiros shows an even larger concentration of tenants and relatively less seasonal workers. Comparing to Cabeceiras and Balainho, besides the tenant's importance, it is also relevant that full time workers are much less important in Parelheiros. Landowners and tenants in UPAs until 5,0 ha represent 79,2 of the total.

The relative importance of Balainho in Cabeceiras' agriculture is less (15% units and 9% in terms of area) than Parelheiros with respect to Guarapiranga (29% for units and 26% for area). Guarulhos has some agriculture but it was not covered by this source. This implies that is not recognized by Secretaria de Agricultura de São Paulo and its services.

Agriculture is still a relevant rural land use and an employment alternative in RMSP.

## **5. Urban policy**

The Brazilian constitution of 1988 defines urban policy. The City law : Estatuto da Cidade from 10/10/2001, defines what means to fulfill the cities' and urban property's social function. It gives to the municipality this responsibility, offering them a set of new instruments to intervene in the territory, besides a new conception of urban management. There are three types of innovations : a new set of instruments to stimulate more than determine the land use and occupation; a new strategy to incorporate participatory decision and the possibility to legalize urban holdings. From the perspective of preserving rural areas it has brought the experience of planning the outskirts of the city, establishing mechanism for its ordered development. The rural areas were formerly considered as the space for urban expansion. It was mainly left to the market the definition of land use and occupation pattern. Since HABITAT II architects had been motivated to the need to promote productive uses in the rural area, particularly urban agriculture. The concern about



water supply and the goal of city sustainability or local development enhanced the concept of « ecological footprint »<sup>7</sup> and brought an increasing concern about effective rural land planning.

Since the Constitution of 1988 , there has been an increasing tendency to introduce participatory management in all sectors and levels of decision. Nevertheless, there is a strong resistance from the public sector and social movement is still fragile. Some of the most outstanding examples are :

Parelheiros, a rural neighborhood in São Paulo, is suffering increasing urban pressure. This led to a social mobilization that met public officials sensitive to the matter and was successful in defining, a still preserved area, as a county official protected area : APA Capivari Mono. Despite the fact that the movement does not strongly reflects the population objectives it has been successful in implementing activities capable of enrolling an increasing number. Through its participatory managing council is receiving important support from well-established environmental NGOs like ISA-Instituto Sócio Ambiental. It has been giving important support to county local government and is partly responsible for the recent creation of Centro de Desenvolvimento Sustentável that has as mission to give support to family farmers, promote organic community gardens and protect environment. They manage to contract an agronomist through Secretaria do Meio Ambiente-SVMA, a long lasting demand from the area.

The sub-county government of Capela do Socorro (2000-2004) is working the project Capela Saudável. Created the Council for Sustainable Development to stimulate participatory management. It is integrated to the cities' local master plan but social movement's involvement is still fragile. In Grajaú, the project Chácara do Conde integrated various social movements for housing and negotiated with County, State and environmental movements during the period 1989-92. The final proposal integrates the demand for housing to environmental protection, including repair of riparian vegetation. The proposal has not been completely implemented. It is observed new buildings without basic infrastructure being built despite the population's effort to prevent it. They still demand the project's implementation, particularly the environmental park, adequate infrastructure and the definition of new areas for settlement expansion.

In the Bororé peninsula, in the Billings catchment , it is being developed the program Ecoativa. It is a participatory environmental management initiative organized by AMIB - Associação dos Moradores da Ilha do Bororé, in partnership with EMAE-Empresa Municipal de Água e Energia and SVMA-Secretaria Municipal do Meio Ambiente, since January, 2000. The Ecoativa is based on a broad articulation and develops environmental education with residents and schools, integrate an University system for monitoring water quality for domestic local use and is leading the demand for the creation of a new county protected area: APA Bororé-Itaim, supported by segments of county government. It is organizing a cooperative based on fair trade and urban agriculture.

Another sub-county, M'-Boi Mirim, has been organizing the Forum pela Vida e Contra a Violência. It integrates several organizations that discuss their problems and

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<sup>7</sup> "ecological foot prints" - area from which the city depends to provide products and services to its inhabitants and to dispose the left over. Theoretically it is not possible to make this direct relation between the city and its surrounding area. A more precise definition would only be established in global terms or in a crafted concept related to energy. Nevertheless it is this simple idea that is influencing the common sense of this new vision of urban planning, at least in São Paulo.

articulate their demand for the public sector. The SOS Guarapiranga an environmental group, is part of the articulation.

## **6. Social organizations and activity**

Considering the two-studied sub-catchment areas it was found heterogeneous situations and social actors with differentiated perspectives of the environmental issue:

a) Neighborhood associations that would tend to have regular condition in the watershed. They are mainly second houses and small farmers that felt pressure from the irregular occupations and would like to halt the current development. They demand improvement in environmental protection. They are few, recently created and fragile;

b) Low income neighborhood association, in high-density demographic occupation, without basic infrastructure and demand basic urban equipment and services like: land regularization, public school and health, transportation, etc...Their location in the area is due to market orientation. In general, settlers understand the relevance of the watershed as a water supply for the city but they confront illegality, the impossibility of obtaining the land ownership document and, as a consequence, all basic public services. They demand a territorial organization, planning and inspection by the public sector to prohibit further occupation. When considering illegal occupation, it is recurrent that they only view who came after them. There is a tendency to articulate different organizations towards a common goal. The cases considered before are not representative of the existing situation but show the effort and the possible strategy being enhanced.

c) Environmental NGOs. Local organizations have a weak representation and few actions. In general, they are related to environmental education in schools (Olhos da Mata and Nureabigua in São Paulo), and eventually ecotourism and trails (Olhos da Mata). In Guarapiranga-Billings region there are a few organizations that eventually organize groups to clean Eucalipto Island and springs, as an educational activity to raise environmental concern. S.O.S. Represa Guarapiranga develops projects related to sanitation and public health in irregular occupations, creation of green preserved areas and environmental education. They participate in the Fórum pela Vida e Contra a Violência, as mentioned before. They have difficulty is participating in committees because members are voluntary and are not available during meeting hours.

In Suzano, there are no local NGOs. They are active in Mogi das Cruzes, Biritiba-Mirim, Salesópolis, (Biobrás and ICAAT (Instituto Cultural e Ambiental do Alto Tietê), Grupo SOS Ecológico, Ambiental Caapuã, PROECO, Caeté, Lar Terra. Their activity is mainly environmental education in schools and industries. There is a starting concern about developing eco-tourism, trails, and environmental protection. The Grupo SOS Ecológico, from Biritiba Mirim, enhanced during 2000, a movement against building the reservoir and against predatory action from the mining sector. It has suspended its action due to lack of resources. Caeté has a project called saving the beach, developed along the road to Bertioaga and is planning to offer courses in permacultura. They participate in the NGOs Forum called Rede Sócio Ambiental do Alto Tietê, created in 2004. This is an initiative from SOS Mata Atlântica and CEMASI (Centro de Monitoramento da Serra do Itapeti, a protected area created by the State in 1987). The proposition is to articulate the various groups through meetings and common action. They organized the Tietê River week when hydrological issues were discussed. These organizations not only have a very short existence but also their members have short experience in participating in social

movements. The Biobrás and ICAAT (Instituto Cultural e Ambiental do Alto Tietê) participate in the watershed sub-committee Alto Tietê-Cabeceiras.

In watershed sub committees there are local environmental NGOs involved but with great difficulty in participating due to limited financial and human resources. In the Alto Tietê Committee there are well known organizations that have a great involvement in general issues. Despite this, they are just starting integration with social movements that work directly with the poor population that illegally occupy the area. ISA-Instituto Sócio Ambiental is involved in Billings and Guarapiranga. It has participated in developing the Participatory Local Master Plan for two sub-county governments : Capela do Socorro and Parelheiros. It also participates in the Management Council of APA Capivari Mono and is giving technical support to the discussion about APA Bororé-Itaim. AGDS works with community garden in urban environment. Has developed a methodology to work problems of violence and robbery related to production. It is organizing an urban agriculture network. It is presently the vice-president in the Alto Tietê watershed committee. SOS Mata Atlântica seems to stimulate the uprising of local movements through its involvement with water quality evaluation. This activity is being developed in municipalities located at the watershed Alto Tietê Cabeceiras and also in M'-Boi Mirim supporting SOS Guarapiranga's activity. Vitae Civilis is very involved in Local Agenda 21 and the Alto Tietê watershed committee. Its local action is related to NGOs more active in neighboring watersheds.

All this organizations considered the social movement's intervention in the Alto Tietê Committee as insufficient . It can be observed a still fragile movement towards a net that has two levels of organization: one directly involved with stakeholders and crafting peoples involvement. The others working in more broad issues, promoting the integration of scattered initiatives, through its own mission: water quality monitoring system; land use planning and local agenda 21.

There is also action from the public sector and universities related to environmental education.

## **7. Urban agriculture**

Agriculture is a long time activity in the region. Its proximity to the urban area had stimulated production but through Cooperativa de Cotia and Whole Sale State of São Paulo Fresh Product Market-CEASA, the local production has reached distant markets. It is, in general, a very market oriented production, developed under the paradigm of efficient large-scale production, using natural resources as if they were not limited. Farmer's decision has efficiently been oriented by benefit and cost analysis.

In general, there is very little awareness among farmers about the educational aspect of the new water management law. The previous enforced penalization. Very few heard about water legislation and water committees. The cost of pumping water is the main farmer's consideration when deciding about irrigation. There was no clear technological change stimulated by environmental awareness or consumer's demand. The introduction of organic manure is more related to cost motivation than environmental concern.

In Guarapiranga were found the most ancient farmers' population. Almost half of the farmers have been there for more than 50 years, some for more than a hundred, while the recently arrived (from the nineties) are also significant. The modal property is of 10 to 60 ha, but the 1 to 5 ha are also relevant. There is no relation between size and time experience in the area. For them, the important landscape change was the perception that

agriculture and particularly potatoes had declined. Just a few emphasized water quality degradation, lost access to the reservoir and recent water transposition from Billings to Guarapiranga, as changes in landscape. There was also consideration about positive aspects of urbanization like better infrastructure.

More than half of the most ancient farmers identified problems with water when directly asked about it. At least four mentioned clearly a change in situation due to environmental impact: change in river course and volume associated to erosion; dried spring; water pollution forcing the use of a less adequate source and dam covered by vegetation providing insufficient water. When asked about availability and quality of water a surprisingly 40% answered that it was insufficient during the draught, but of good quality. The wells are mainly 5 to 10 meters deep and sufficiency is not related to deepness. Many have wells for domestic use, despite the fact that they have creeks and springs in their property. In terms of legal prohibition, the most traditional farmers are the ones that had been penalized for deforestation. There are those who claim difficulties to maintain roads. In general tourism is seen as having a positive impact because they invest in the area, brings new people, better infrastructure and consumers. Negative aspects are related to unpunished deforestation, profound wells that diminishes spring water and violence. The tourism « Fishing and Paying » is seen as a good alternative for former farmers.

Urban settlers are generally seen as bringing violence (35%) and only (15%) prefer not to discuss the matter. A surprisingly 50% has positive perspectives about it. The problem has very local solutions and is meaningless in other context.

Farmers have some social organization. Only 55% belongs to a union and other 50% participates in some sort of community life: a church or a Japanese Local Cultural Center. They do not have any involvement with environmental movement.

In Guarulhos, in the last remaining agricultural area, farmers arrived mainly between the 50's and 60's. Their areas are predominantly between 1 and 5 ha and there is none above 10. There is a situation of insufficient water during the dry season for 43% of interviewers. Despite the fact that the main rivers Guaracau and Baquiruvu are class III, not recommended for horticulture irrigation, they considered the water to be of good quality. Farmers located in the riparian zone represent almost 50% of the total and the quality of their water is influenced by urbanization. Their wells are mainly caved and only two have profound wells. When asked about upstream water use conflicts it was mentioned industrial pollution, particularly a bear industry, was mentioned by 40%. Housing developments were mentioned by 26% and just 1% indicated conflict with other farmers.

There proximity to the city, and particularly the easy access to São Paulo's market is considered an advantage by 63% and only 20% do not see any advantage. At the other side 17% considers that there are disadvantages. Robbery is considered a problem by 63%; pollution by 33% but only 6% considered that urban residents do not respect farmers or are a threat. Robbery influences the irrigation system. Around 50% uses only hose.

Their social organization is weak. Only 30% belongs to Farmer's union and there is only one that participates in a farmers' association. Their community life is related to the urban areas. Farmers in Guarulhos seem to have less comprehension of environmental problems affecting their activity and are less organized (assisted) to participate in changing their present reality.

Suzano has a young farm population. Most of it came after the 50's with a larger number after the nineties. In terms of property size it is well distributed along 1 to 5; 5 to 10 and 10 to 40 ha.

Only 14% considers having problem related to water : low inflow during dry season; silted water; silted dam and impossibility to build a dam. In terms of upstream conflict less than 1% has indicated to have problems with other farmers. There is a larger number of profound well (14%). In general, the water used for production comes directly from the river or creeks, but at least 17% has irrigation dams. They considered the received water of good quality but 25% informed that the outflow from production has silt. The great majority has not experienced any problem related to the environmental law. Only 14% had problems related to cleaning the dam or deforestation.

The urban proximity is considered an advantage for trading facilities and access to services (64%). Only 14% did not know or consider being of any advantage. Robbery is considered a disadvantage by 53% and pollution, including visual pollution, by 14%. Some 28% consider that there is no disadvantage in been near urban areas.

Community life seems to be stronger in Balainho. There are three small villages in the area where farmers go frequently. Only two farmers live outside this watershed and 33% participate in the Local Japanese Cultural Center-BUNKIO and another 17% participates in V Divisão rural community center (mainly church).

The studied areas seem to represent three different situations: Guarapiranga has more awareness on environmental problems and policy. Has some social organization since 50% participate in community life (church or Bunkio) that is an important factor considering that there has not been any clear behavior change towards sustainability. In Balainho, they seem to be less aware of environmental problems and policy but community life is stronger since besides the 50% involved with church and Bunkio, they are integrated to the local villages' life. Guarulhos is in the most difficult condition since is less sensitive to environmental problems and has no social organization and local social life. The urban areas are in the outskirts of the second largest city in the State and there is no Bunkio or a reference church in the rural area. They do not even have the public services related to agriculture.

## **8. Tourism : secondary homes**

On the Parelheiros' watershed there are secondary homes classified in different groups according to owners desire: a) to remain in the region; b) to sell; c) to be in a rural condo; d) to transform it on the family's main home. Generally, they arrived in the region between 1960 and 1990, primarily motivated by the nearness to the main residence, but there are those attracted by the environment. Few know the region's historic details.

Home proximity, in São Paulo, is a relevant factor since it determines the time spent to commute. Proximity is also the main source for environmental degradation since it favors new legal or illegal allotments, without infrastructure, for low-income residence. The impact is mainly deforestation, water pollution from sewage and garbage, felt and criticized by landowners. It is also noticed a decrease in flora and fauna, particularly the variety of fish species. Their water is provided by wells. It is common to have to deep it in order to keep the water supply. In many cases it dries during the dry season and they have to buy water. It is not clear if they understand the causes related to ground water availability.

Landowners seem to have an environmental perception, particularly about the relation between forest and water. They know about the environmental law, particularly related to water and are aware and accept environmental police surveillance.

Properties vary in size<sup>8</sup> but the permeable area is always more than 82%. Small properties do not have native forest but there is always a garden and, on most cases also a vegetable garden and/or an orchard. In general, their only preservation attitude is maintenance of their property. They support a public policy to preserve the Atlantic rainforest and as a second priority, the water.

They favor engagement in the Natural Private Permanent Reserve-RPPN program (federal policy of set aside) and would like some additional economic incentives and public services. They consider that environmental education and orientation to landowners related to agricultural activity, forest preservation, garbage dispose and social organization, can enhance preservation.

Landowners agree that tourism, and secondary homes, increase the possibilities of preserving the environment. Some argue that urban degradation can badly affect its potential but enhances the opportunity open by the Environmental Protection Area-APA Capivari Monos and the Indian's Reserve, existent in the area.

Agriculture is seen as a friendly activity, helping tourism development and not creating a relevant pollution problem. They consider that new neighbors, except illegal allotments, contribute to the same landscape development proposal. Violence is a problem in certain locations but not close to large tourism equipment. The proximity to an urban center did not revealed itself as a conclusive violence indicator.

In Balainho watershed, there are many appealing attractions in the surrounding area. Some related to sport tourism: "Pedra Grande" in Quatinga and water falls in Serra do Mar both in Mogi das Cruzes; trails to Paranapiacaba or just in the surrounding forest ; creek, lakes and dams for swimming. Cultural tourism is being developed related to cavalcade during religious holidays to sacred places.

The watershed has three clearly defined regions in relation to secondary homes: Cabeceiras, Middle and Low Balainho and the population is mainly from the ABCD cities. On the Cabeceira's region, where the slope is not appropriate for agriculture, Atlantic forest predominates even within the boundaries of secondary homes. There is also some eucalyptus occurrence. On Middle Balainho predominates a mix of tourism and agriculture. At Low Balainho there is a predominance of agriculture. Secondary homes are smaller and there is no forest in the landscape. This suggests two types of secondary homes: those associated with forest landscape and the others on urbanized sites.

Landowners arrived in the region through 1970 to 1990, motivated by the region's natural resources, community life and also home proximity. The most important urban impact is illegal or irregular garbage dumping, at three specific points on the micro-catchment. Water pollution is a concern related to sewage from Quinta Divisão, a small rural neighborhood in the heart of Balainho, and illegal allotments in the outskirts of Vila Ipelândia, at the fringe of the water basin. Flora and fauna are suffering from the increasing population and predatory hunting, from residents. The impact on fish is felt by just a few, and predatory fishing is blamed. Most second residence originated from the division of rural properties, productive or not.

Most owners are aware of environment laws. Environmental police is active nevertheless their frequency visit has lowered and for some, they only come by denouncement. They recognize the importance of protecting the area to provide the RMSP

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<sup>8</sup> From 1,000 mts<sup>2</sup> to 100,000 mts<sup>2</sup>

with quantity and quality water. For them, environmental public policy should aim at Atlantic forest and water preservation, in this priority order. They considered that they preserve landscape through every day care of their properties. There is also a worry to grow native species but the vast majority does not consider enrolling in the RPPN proposal. Most owners considers that some sort of incentive should be given to promote natural resources preservation. Nearly half of the surveys suggested that lowering the IPTU<sup>9</sup> would be a viable way. Other proposed measures are: “technical orientation on sustainable practices; develop a program of technical orientation for house keepers and owners of secondary homes; infrastructure like better roads and garbage collection; environmental education for tourists; incentives to economical activities. For themselves, the suggestions were: treat sewage; generate less impact on the environment; creation of RPPN; organizing a local tourism forum and cultivate native plants. For them, tourism enhances preservation besides generating jobs and infrastructure improvement. Some owners are worried about landscape degradation and consider that this might be a negative factor influencing the future possibilities of tourism in the region.

In general agricultural activity is seen as complementary to tourism because it enhances the rural landscape, although it is evaluated by some as a source of water pollution. Different tourism equipment, existent in the region, are also seen as improving the landscape despite the fact that brings a large number of people with urban values and habits. On the other side, resident neighbors with urban jobs are seen with distrust, particularly those who live in irregular allotments. Violence is associated with robbery, but seems to be decreasing. It is associated with the proximity to illegal settlements in the outskirts of an urban center. It does not seem to be an obstacle to tourism development.

Water conflicts are mainly related to pollution by sewage but less frequently from agricultural activity. They also mentioned problems related to polluted water flowing to the river. Nevertheless, conflicts do not seem relevant since it is possible to find individual solutions by caving a well. Landowners supplied by wells stated that during the draught period, particularly in high lands, there is scarcity of water. They are not aware of the participatory water management system organization for their region.

The results show that the landowners are conscious of their role on preserving natural resources and particularly water source, to provide it with the needed quality and quantity to the RMSP. In their majority, they seem to favor policies that will strength preservation, they approve environmental inspection, and they are aware of what is causing pollution and have proposals about what should be done. Tourism is considered as an important ally to promote preservation complemented by agriculture but lacks organization and public policy.

Residents on illegal settlements are seen with indifference or distrust. The main problem is associated with pollution but there is also an association with violence. In Parelheiros, where violence is larger, there is a strong view that only a minority is a threat. The problem is not considered sufficient to lower their interest to remain in the area. In Balainho there is more suspicion about the residents but the problem is considered to be decreasing.

An important difference between the two water basins was related to the landowner interest in enrolling the RPPN project. In Parelheiros they are favorable but not in Balainho. This seems to be related to the fact that they are partially under the county land

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<sup>9</sup> IPTU is the county's land tax. This identifies the area as urban from the local policy perspective.

tax IPTU, consequently not subject to incentives. They also considered that incentives on IPTU could stimulate forest preservation. There is also a difference about knowledge related to the participatory water management system, not known in Balainho. There is no strong social organization or community life among second house owners and their employees but there is a will to organize a local tourism forum in Balainho, and there is a claim for a public policy to promote the sector.

## **6. Is the environmental movement crafting a change to the existent trend of disorganized urban expansion?**

There are evidences that RMSP's agriculture still resists the lack of public policy and urban expansion. The activity uses modern technology and is market oriented. Together with tourism, specifically tourism equipment and secondary homes, they represent friendly environmental forms of land use. Technological improvements still must be made and environmental education is clearly necessary to reduce environmental impact of their activities.

There is no environmental organization working and integrating with local social movements involving the rural population. The main actors in the rural watersheds might have an environmental consciousness considering that they have a good perspective of the problems they are facing. This is true of farmers and owners of secondary homes. This knowledge probably comes from their experience and observation, by their profile that made them search to be in a close relation with nature but, it has also to do, with information available in society, brought about by the effort of the environmental movement.

There is a common knowledge about issues related to forest legislation and implementation. Water management law and implementation was introduced much more recently and is less well known, particularly in Cabeceiras. There are no clear signs that technical or personal behavior has been transformed for sustainable practices. In other words, there is concern identified in their speeches but not really transformed into action. In general, an individual solution is seek with no concern about the environmental impact. Wells are the best example. It is common to cave deeper wells, to overcome the pollution problem of surface water. In Guarulhos there is even a demand for this, to the public sector.

Owners of secondary houses showed interest in enrolling preservation programs if there was an incentive for it. The federal program RPPN is not always applicable since some areas were converted to urban and are under county law. A policy must be designed.

Their involvement in local social organization is weak but it was identified how a local process can be initialized, mainly through Bunkio and churches, but also small villages in Balainho. Situations like Guarulhos, where there is no rural organization and community life is entangled with the urban, poses a different challenge.

The information obtained through this research showed that the environmental and social movements are only integrated in very few experiences, with urban residents. Nevertheless it was possible to identify a fragile strategy where a local environmental organization works integrated to SAB-Neighborhood Friends Society, or there nets in a larger neighborhood like Fórum pela Defesa da Vida. There is a demand for a public policy related ton urban planning.

Integration between the environmental movement and organizations that integrate people with rural life style activity will strength compatible uses while the needed



integration with neighborhood societies is oriented to mitigate the negative impact on environment, besides improving their quality of life.

At the other side, well-structured environmental organizations, participate in Committees, work in larger areas and have a fragile integration with local organizations. It seems that two levels of environmental organizations are being developed, considering their mission. Nevertheless, they are not well integrated with negative effects in the efficiency of local action and also in the potentiality of their representation in Managing Committees. Grass root organizations would be a powerful instrument on these Committees but human and financial resources limit their participation's possibility. The environmental movement has to organize itself as a net, still to be crafted.

Urban dwellers were not subject to a field research so there is no clear indication about their environmental consciousness and practice. There is a common view that sewage pollution is the main problem in the area, mainly caused by the lack of urban settlements' infrastructure. Local solutions for this problem can be emphasized by environmental education with proper technical solutions. It is necessary to investigate its potential to promote integration among those living as rural or as urban, in proximity.

This paper leads to three main proposals to be discussed with social and environmental organizations involved in the area. The first one is related to improve integration within the environmental movement. The two others are related to the population that has productive activities or live in the rural area. It refers to crafting strategies with new partners to enhance social organization among them and promoting integration between those organizations, the environmental movement and urban neighborhood organizations.

If the environmental movement will be able to influence the land use and occupation pattern, this articulations must be enhanced. The social movements today seem to be moving in this direction.

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