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The Planning Process in São Paulo, Brazil

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The Planning Process in São Paulo

by

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Dedication

for my grandparents and parents

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Abstract

The Planning Process in São Paulo, Brazil

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The University of Texas at Austin, 2010

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Planning for the development of water infrastructure within informal settlements in the city of São Paulo, Brazil is a complicated process. This research uses the Rational Planning Model to explore the differences between planning in North America and in the Global South. Further, this research develops the various aspects of planning in the Global South through the examination of policy documents, interview data to identify the behavior of the practitioner – the urban planner - and his/her agency – creating the municipal perspective.

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Chapter 1: Introduction

What should the role of urban planners be?

- Jorge Wilhelm, a São Paulo city planner (2004)

Urban planners ("planners" hereafter) work in different parts of city governments and in different municipalities. For example, planners work in city housing departments, public works and engineering departments. Elected officials, representing neighborhoods within a city, are also involved in planning the development and growth of urban areas. Together, these individuals evaluate the urban environment for changes in housing-type distributions, mass transit and water infrastructure. Their presence in city planning affects thousands and even millions in the urban environment, such as the case of São Paulo Brazil (Prefeitura de São Paulo 2006).

The city of São Paulo, categorized as a mega-city with a population over 10 million inhabitants, is a compelling place for water research because of its size. The city shares over 30% of the Brazil's gross domestic product and a large portion of the country's water resources. The regional metropolitan area of São Paulo requires over sixty-seven cubic meters per second of potable water for its inhabitants (Braga et al 2006). Historically, problems of water quality plagued the city of São Paulo but recently water delivery has become a growing problem (Gleick 1998). Growing number of areas lack infrastructure for water delivery; the city has over 169 slums and these areas are growing at a rate of ten percent each year (Azevedo 2010, Henrique 2010. As a result, the planner and city official are becoming instrumental in the design, regulation and future development of the city and region, particularly in regard to water delivery systems.

Illustration 1: Location of Research Area.[1]

As city officials, planners work within a system of constraints ranging from ecological constraints, like topography to government regulations. In this case study, I examine the planning frameworks São Paulo city officials use to make decisions concerning the provisioning of water infrastructure to informal settlements.

[1] Country Information from Cities Alliance 2008.

The Rational Planning Model, a rigorous evaluation tool, will set guidelines to evaluate how municipal agents function within planning frameworks to provide water infrastructure to informal settlements. My research questions include:

1. What are the various municipal planning approaches for delivering and provisioning of water infrastructure to informal settlements in the city of São Paulo?
2. What, if any, differences are there in the municipal planning process associated with informal settlements compared to the Rational Planning Model developed in North America? That is, in what ways does the Rational Planning Model as a framework apply to the evaluation of the municipal planning processes in São Paulo, as an example of planning processes in the Global South?
3. What is the role of the practitioner in the context of the Rational Planning Model? What can you learn from the practitioner to develop a municipal perspective?
4. What are the activities of the practitioner in planning for water infrastructure in São Paulo? What is the municipal perspective in the context of the Rational Planning Model?

My research uses the following definitions. *Water infrastructure* is the delivery and management of water through a system of pipes, storage tanks, reservoirs and water distribution points. Water infrastructure also involves the delivery and maintenance of water through a system of pipes, storage tanks, reservoirs and water distribution points. A *policy framework* is a set of guidelines used to make decisions about the allocation, and maintenance of water infrastructure. *Informal settlements* are areas of highly dense settlements characterized by self-construction located in either legally or illegally settled

areas (see Table 1) (Prefeitura de São Paulo 2008, 50)." Informal settlements are located in precarious areas that contain little to no urban infrastructure, and generally inhabited by low-income populations (Prefeitura de São Paulo 2008). *Irregular settlements* are property occupations that are subdivided in an illegal manner by the property owner and may contain little to no urban infrastructure (Prefeitura de São Paulo 2008).

Type	Situation	Settlements	Houses	Inhabitants	% Population Total
Favelas/ Informal Settlements	In watershed protection area	247	58176	228,159	
	Outside watershed protection area	1,326	321,060	1,311,112	
	Total	1,573	377,236	1,539271	14.21%
Urbanized Centers	In watershed protection area	78	14,143	57,579	
	Outside watershed protection area	144	16,659	87,822	
	Total	222	30,802	125,401	1.16%
Irregular Lots	In watershed protection area	325	26,216	104,151	
	Outside watershed protection area	910	458,023	1,679,411	
	Total	1,235	484,239	1,783,562	16.48%
Total - Precarious Settlements		650	892,277	3,448,234	31.83%
Total – Precarious Settlements in watershed protection areas		850	96,535	389,889	3.60%
Total – São Paulo Habitants				10,834,244	

Table 1: Informal Settlements of São Paulo.[2]

Irregular settlements are commonly found on privately owned land with residents that fall into a wide range of income levels (Prefeitura de São Paulo 2008). *Public ownership* is defined as land owned by a federal, state or municipal agency. *Private ownership* is areas where the property owner is a private entity or company.

[2] Adapted from Prefeitura de São Paulo and Cities Alliance 2008.

In the process of providing infrastructure to informal settlements, residents are sometimes forced to relocate within their own community. There are three key definitions for this process: First, *urbanization* is the process in which an area lacking utility and infrastructure services undergoes a design process to implement needed improvements. Second, *reconfiguration* is the re-design of a community to facilitate an implemented urbanization process. Third, *Resettlement* is defined as the act of locating families to other areas of the informal settlement who have agreed to the resettlement process. Further, *Social tariff* describes the costs for public services determined by the income of the household. Social tariff rates are typically less than 10% of a household's monthly income (Henrique 2010). *IPVS*, the Paulistano Index of Social Vulnerability, is the social vulnerability index developed by SEADE, The São Paulo State Foundation of the System of Data Analysis, who examines where low-income households lack control of their welfare, and where they lack the political and financial ability to obtain available public resources (SEADE 2003).

Developing a new approach to providing water distribution services to informal settlements requires employment of a new management approach and a specialized framework for the city of São Paulo. North American planning academics have described numerous theoretical and practical frameworks that planners work from to address problems of water provisioning. Frameworks developed in North America include advocacy, pluralism, incremental and rational planning. Thus, my research discusses theoretical frameworks, policies and planning approaches related to the provisioning of water infrastructure to informal settlements in São Paulo as an example of planning in the Global South.

The following chapter details my research design. In chapter 3 I discuss research related to the Rational Planning Model (RPM), reviewing the planning process within the

RPM, while drawing from the works of Hilda Blanco, John Friedmann and Herbert Simon. Since my work is focused on planning and city officials, research using the municipal perspective, the works of John Forester and Donald Schön, provide a practitioner framework within which to understand the narrative data collected from interviews. Chapter 3 will conclude with an explanation of the phenomena of informal settlements in Brazil.

In chapter 4, I will examine the planning process in São Paulo. There are a series of national, state and city policies that directly influence and guide municipal planners involved in the provisioning of water infrastructure to informal settlements. For example, the Constitution of 1988 of Brazil guides the legal framework where master planning and support of social rights are the stated goals for municipalities. Follow constitutional directives, municipal bureaucracies develop site-specific goals that include working with informal settlement residents. For example, the Technical Planning units of the Sao Paulo municipality have developed quantitative methods for site selection of the urbanization process to support the legal goals and to include all forms of housing, including informal settlements, in the city of São Paulo. The Public Participation Framework of the municipality works in conjunction with the Technical Planning team to ensure community participation, information access, and social inclusion in the decision-making process.

In chapter 5 I detail each step of the Rational Planning Model to planning approaches in the city of São Paulo. Further inspection of narrative data provides a rich analysis of the process of social mobilization in the informal settlements to obtain water services from the municipality.

The last chapter connects the distinct characteristics and themes from the São Paulo planning process, the Rational Planning Model and the public participation

framework. I conclude with recommendations for policy makers, municipal planners, and for the refinement of the RPM in relation to planning in the Global South.

Chapter 2: Research Design

I conducted this research from 2008 to 2010. The following includes detailed descriptions of the methods used to conduct this case study: interviews, accessible online map viewer, and review of policy documents related to the planning processes in general and to the water provisioning process specifically.

LIMITATIONS

During the research process, I encountered limitations regarding information access, availability of interviewees and time constraints. Mapping information was limited to the map viewer provided by the HABI website. I initially hoped to use ArcGIS software to conduct a spatial analysis of the infrastructure and informal settlements in São Paulo but GIS files may be accessed by government agencies. Second, I could not conduct interviews with HABI agents due to their schedule restrictions, and project deadlines. Likewise, I traveled to São Paulo during the week of January 25th through the 29th. With only five business days, interviewees were hurriedly scheduled. Unfortunately, I was only able to interview three individuals. I attempted to conduct interviews through email communications and only received one response out of five.

VALIDITY

Internal validity is addressed by defining key terms and finding multiple sources for the triangulation of data. For example, key terms such as; water infrastructure, policy framework and informal settlements will be used in a consistent manner therefore adding another degree of internal validity. In addition, sources of information for the following concepts were instrumental to ensuring internal validity: the Rational Planning Model, policy documents, and interview questions. A Rational Planning Model will be derived

from previous scholars for the evaluation tool. As long as consistent use is maintained for the rational planning model as a tool of evaluation, this research project will gain much needed validity in the analysis section. The interview portion of this research project will provide data to answer the research questions. To ensure much needed validity to the interview section, I have reviewed these questions with a private civil engineer in Austin, a Brazilian PhD government student at the University of Texas and a project manager of a private construction firm in São Paulo.

Moreover, external validity is ensured by the replicability of research steps outlined in this chapter and the generalizability of applying these methods to other case study cities. To support this replicability there is a high level of transparency of research steps. Plus, the interviewees included in this study are representative of the desired target population. Finally, the interview questions are replicable and generalizable for practitioners at the municipal agencies of São Paulo, and can be applied to other cities and their respective planning agencies.

INTERVIEWS

Interviewees are presented in table 2 according to phase, time period, agency or university, and time period of the interview. All interviews were conducted in a confidential manner and any names in this study have been altered to ensure that confidentiality.

Phase	Time	Contact	Organization	Interview Format
I	May 2008	*Ana Lacerda*	The University of São Paulo	In Person
	June 2008	*Paulo da Silva*	The University of São Paulo	In Person
II	January 2010	*Samuel Almeida*	COBRAPE	In Person
	January 2010	*Daniel Henrique*	SABESP	In Person
	January 2010	*Julio Accioli*	SABESP	In Person
	February 2010	*Walter Azevedo*	SABESP	Email

Table 2: Phase, Time Period, Interviewee and Interview Format

Two interviews were conducted in 2008 to gain a broad understanding of the water resource and distribution problems in the metropolitan region of São Paulo. From these interviews I refined interview questions for additional research participants.

Sampling was constrained by distance, time and communication method (email, phone and in person interviews). Interviews during phase one were conducted through help from colleagues in São Paulo and recent graduates from the University of Texas. These two interviewees were conducted with instructors at the University of São Paulo; one in the civil engineering department who worked on the basin management for the metropolitan region of São Paulo; and a professor of environmental policy who has worked in a number of non-governmental organizations on environmental policy. *Ana Lacerda* is a professor of civil engineering and has worked with the Alto-Tiête Basin committee. While working with the committee, she helped to publish reports regarding the water resources of the watersheds in the metropolitan region of São Paulo. This region contains thirty-nine municipalities and seven sub-basins of the Tiête River. *Paulo da Silva* is the policy professor who has worked with the non-profit Five Elements for changes in environmental policy implementation and enforcement. Mr. da Silva is a

colleague of Robert Wilson, an economic policy professor at the LBJ School of the University of Texas at Austin. Interview notes for these two interviews are included in Appendix A.

In addition to these two interviews, four more interviews were conducted in January 2010. Three participants are from SABESP, the water and sewer provider for the metropolitan region of São Paulo. All SABESP interviews were made through a contact from the Getulio Vargas Foundation and the City Planning Department of São Paulo. The first interview was with *Daniel Henrique*, a director at SABESP. The second interview is *Julio Accioli*, a lead civil engineer. He is also a team member working on the Clean Streams Program that works to urbanize informal settlements in the periphery of the metropolitan region of São Paulo. The third interview is Walter Azevedo, a community agent. During the interview with Daniel Henrique, I had requested to contact a community agent. Mr. Henrique forwarded my interview questions via email to Mr. Azevedo who promptly responded by email. The fourth interviewee, Samuel Almeida, is an employee of a private construction firm, COBRAPE, who has worked on the design and construction of urbanization projects for informal settlements. Mr. Almeida was a contact made with the help of Daniel Nogueira Budny, a PhD candidate in the Government department at the University of Texas at Austin.

The second phase of interviews provided a municipal agency perspective to the actions associated with informal settlement water provisioning and delivery. Following is a list of the interview questions, translations and reasoning for each question.

1. What is your position within your government agency? *Qual a sua posição dentro da agência pública?*

This question aims to understand the level of seniority in each interviewee's respective agency.

2. In your position, what is your involvement in decisions made about potable water delivery and allocation to city residents? To residents in informal settlements? *Em sua posição, qual é o seu nível de envolvimento nas decisões sobre a distribuição de água potável e a atribuição aos cidadãos em assentamentos formais? E aos cidadãos em assentamentos informais (favelas)?*

The first two questions establish the context of the officials' involvement in the planning process for the water infrastructure services to informal settlements.

3. How does your agency deliver service to these areas? *Como a sua agência entrega serviços nessas áreas?*

Question 3 allows for varying viewpoints of delivery, which include physical and technical issues, as well as the political process for securing services and infrastructure. Areas in this question refer to both informal and formal settlements

4. Does your agency monitor water consumption across different neighborhoods? Formal and informal settlements? *Sua agência Monitora o consumo de água por bairro? E por Assentamentos formais e informais?*

An important element to the Rational Planning Model is the last step of monitoring and evaluation. This question allowed me to learn if there was a system of evaluation in place for the municipality. In the interview data, interviewees detailed the differences in pay structures for low-income residents.

5. What kinds of information do you use in deciding how much water to allocate to informal settlements? And what kinds of information do you use in deciding when to do maintenance on the water delivery system to informal settlements? *Usam-se quais tipos de informação para decidir quanta água a atribuir aos assentamentos informais? Usam-se quais tipos de informação para decidir quando precisar fazer manutenção no sistema de entrega de água para assentamentos informais?*

Question 5 asks participants to describe the information they use to make decisions. Information types may include census data, individual or group requests from

settlements, or aerial mapping for the development of water provisioning and maintenance.

6. Are there any challenges to allocating and delivering potable water to these residents that are related to other issues in the city? *Existem alguns desafios na captação e distribuição de água potável relacionados com outras questões na cidade?*

This question aims to see if there are challenges, whether technical (infrastructure design and construction) or policy related.

7. How does your agency work with water users of informal settlements? *Como sua Agência trabalha com os usuários de água dos assentamentos informais?*

Question 7, I asked research participants to discuss the methods their agencies use to work with (or against) informal settlements. The methods include working with other federal and municipal agencies such as HABI, SEHAB or SABESP.

8. How is water delivered to informal settlements? Do residents have to go to a water distribution point? *Como a água é distribuída aos assentamentos informais? Os residentes têm que ir a um centro de distribuição?*

The response from this question established the range of methods of delivery and provisioning of water services. This service may or may not differ from the various types of settlements in the municipality.

9. What are some challenges in delivering water to informal settlements? *Quais são os desafios na Distribuição de água para os assentamentos informais?*

Building on the previous question, I tried to parse the extent of differences in treatment of informal settlements.

10. If you could change something about the delivery and management of water to informal settlements, what would that be? *Se o/a senhor/a*

pudesse mudar alguma coisa na distribuição e gestão de água para assentamentos informais, o que seria?

This question asked research participants to discuss alternative strategies not possible under the current existing political and policy due to related constraints.

11. Is there anything else you would like to me know if you have not addressed it here? *Existe mais alguma coisa que o/a senhor/a gostaria de me contar?*[3]

The last question allowed for open discussion of issues not addressed by the previous questions.

The eleven interview questions attempted to understand the municipal planners' perspectives regarding the provisioning of water to informal settlements. From the narrative data collected, a municipal perspective may be constructed and framed within the planning process of São Paulo. The municipal perspective will provide necessary insight into the practitioner's role in the decision-making process for the provisioning water infrastructure to informal settlements. Interview transcripts for these interviews are included in Appendix B.

MAPPING AND SITE SELECTION

For the next phase of my research, I developed maps produced from the HABI interactive mapping website (http://www.habisp.inf.br/). Initially, I was hoping to have access to spatial data (geographic information software shapefiles, using ARC-GIS) in order to map the distribution of water infrastructure for the city, but I was not allowed to obtain them due to governmental security restrictions. Instead, I focused on two different

[3] Translations of interview questions to Portuguese were completed by Daniel Nogueira Budny, PhD candidate, Department of Government at the University of Texas at Austin.

study areas because research material was accessible in both areas: Paraísopolis and Helíopolis. These two informal settlement regularization processes have widely available information in recent publications provided by HABI regarding the challenges and evaluations of the planning process. Through the HABI portal website (found in Appendix C) I followed their technical planning process of map development. The steps to create these maps, located in Appendices D and E, are in Table 2.

Steps	Map Creation	
1	On top left corner of page, searched for Paraísopolis	Brings you to the site in the map viewer at a scale of 1:5000
2	Go to left column where you can see the tool Actual Layers, "*Camada Atuais*"	
3	Click on add layers "*Adicionar Camada*(*s*)	
4	Add the following layers	Instances of properties Number of households Income level of head of household Percentage of area in *ZEIS* Index and Components of Prioritization Paved Roads coverage Water supply coverage Sewer system coverage Risk Index Storm Drain coverage Prioritization Index Health Index Urbanization Index Trash Collection coverage Percentage of households with Electricity Social Vulnerability Index Public lighting system coverage
5	Maps of each layer are found in Appendix X.	
6	These steps were also applied to the informal settlement of Heliopolis.	

Table 3: Steps for Map Creation.[4]

[4] Map creation website address: http://mapab.habisp.inf.br

The layer attributes viewed during map creation are the prioritization indices. The prioritization indices are quantified characteristics of the informal settlements used for the decision-making process to implement an urbanization process. The indices will be discussed in greater detail in chapter 4. Information is summarized in Table 4.

Feature Layer	Informal Settlement	
	Paraísopolis	Helíopolis
Type of Favela properties	Municipal	Municipal/Particular
Number of Households	> 6800	> 6800
Area in ZEIS (%)	80-100	80-100
Paved Roads (%)	40-60	80-100
Households with Water Supply (%)	60-80	80-100
Risk Index	0-20	0-20
Storm Drain Coverage (%)	40-60	40-60
Prioritization Index	20-40	20-40
Health Index	40-60	60-80
Urbanization Index	40-60	60-80
Households with Trash Services (%)	40-60	80-100
Households with Electricity (%)	40-60	80-100
Social Vulnerability Index	60-80	60-80
Public Lighting System (%)	40-60	40-60
Median Income	400-500R/Month	500-900R/Month
Condition of Occupation	Proper	Proper
Sewer Coverage	20-40	60-80

Table 4: Paraísopolis and Helíopolis Prioritization Indicators.

Two maps were provided by SABESP, which detail the water delivery and sewage collection of the regional metropolitan area of São Paulo. These maps are included in Appendix F: SABESP Maps.

POLICY DOCUMENTS

I collected policy documents in order to detail and understand the legal frameworks under which municipal officials make decisions for water delivery and provisioning. Policy documents such as the Brazilian Constitution, federal policies for

municipalities and city documents regarding the planning process were readily available online. Table 4 lists the websites and documents collected and evaluated.

São Paulo Planning Department	http://sempla.prefeitura.sp.gov.br/index.php Strategic Master Plan 2006-2009 General Map Demographic Information Laws enacted in relation to urban policies
The State of São Paulo, State Capital Website	http://www.capital.sp.gov.br/portalpmsp/homec.jsp General information about the municipality
Brazilian Government	http://www.brasil.gov.br/sobre/brazil/citizen/constitution-1 Translated versions of the Brazilian Constitution
Cities Alliance	http://www.citiesalliance.org/ca/ A non-profit international organization

Table 5: Policy Document Information.

In addition to these websites, Vanessa Padía, a project manager at HABI, provided me with a number of publications concerning the urbanization and regularization process of informal settlements in São Paulo. HABI and Cities Alliance publish these materials in conjunction with worldwide studies on the urbanization of slums.

SECONDARY SOURCES

The next set of research material includes works from academics in the fields of urban policy in São Paulo regarding water infrastructure, housing and informal settlements. Some materials were provided by HABI; HABI publications regarding the planning process of informal settlement urbanization in São Paulo.

Specific materials include academic texts, articles, and works centered on planning methodology; specifically critiques of the Rational Planning Method. Works by Hilda Blanco, Donald Schön, John Friedmann and Herbert Simon are included to develop the historical foundations of the Rational Planning Method (RPM). From these academics

I create an evaluative framework of the RPM from which I compare and contrast the São Paulo planning methods for the provision and maintenance of water infrastructure to the North American model of RPM.

To develop the framework for São Paulo, I include policy documents and texts from the city agency, HABI, and the non-governmental organization, Cities Alliance. This material included the planning and social work methodologies, and site-specific material for Paraísopolis and Helíopolis.[5] In addition to these texts, interview data is included to provide individual perspectives about the city's methods of urbanization. The interview data, the spatial analysis data from the maps, and the academic sources serve as evaluation tools used for understanding the planning process of urbanization and its relationship to the Rational Planning Model.

CONCLUSION

Through the methods of narrative interviews, mapping, examination of policy documents, the use of secondary sources of theoretical frameworks and research materials by academics in Brazilian cities, I am able to, first, analyze various planning approaches for the provisioning of water to informal settlements; and second, focus on the theoretical frameworks of the Rational Planning Model to explore differences and similarities in the planning methods of São Paulo, Brazil.

In the following chapter, I expand on the history of the Rational Planning Model, its intellectual origins and trajectories and review recent critiques of it as a planning framework. Further, I address materials related to topics of planning in the Global South, informal settlements, and most importantly, the role of the city from a municipal perspective framework.

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[5] Social work methodologies are public participation processes described by material from Cities Alliance 2008.

Chapter 3: The Rational Planning Model

INTRODUCTION

The theoretical foundations of this study rest upon the development and application of the Rational Planning Model. John Friedmann (1987) describes the development of planning theory in four areas of thought: policy analysis, social learning, social reform and social mobilization (see Figure 1).

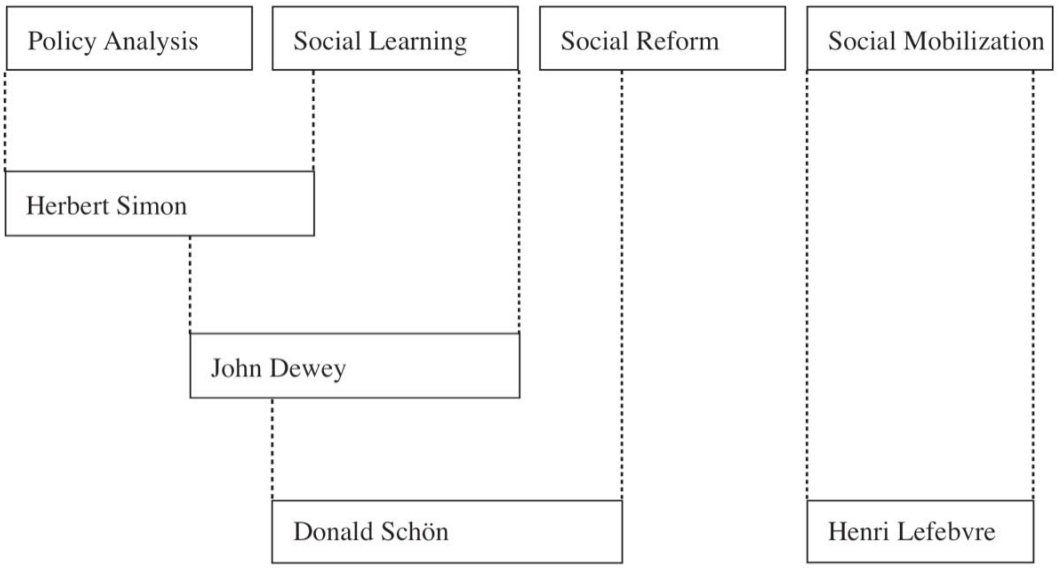

Figure 1: The Four Traditions of Planning Theory.[6]

Policy analysis lays the foundation of scientific reason for the development of policy from which the Rational Planning Model was introduced as a decision-making process. Simon used a behavioral approach of practitioners to develop the analytic method as a way to arrive at a decision (Friedmann 1987). Social learning, a theory based

[6] Adapted from John Friedman, 1987.

on the writings by John Dewey, focuses on learning through doing. Experience is the optimum method to make informed decisions while social reform "focuses on the role of the state in societal guidance (Friedmann 1987, 76)" where the state institutionalizes all activities in its domain. Lastly, social mobilization allows for "collective action from below (Friedmann 1987, 85)." Disempowered groups within the social reform or policy analysis traditions will collectively act for the goals of equality and social justice. Henri Lefebvre has described social mobilization in urban settings as the "right to the city" only when citizens are granted a place in the creation of their environments (Fernandes 1995).

Since the Rational Planning Model is nested within the policy analysis tradition, further development of this tradition needs to be explored. Simon constructs the Rational Planning Model as a behavioral process for an individual. The municipal perspective describes the behavioral process from which I will analyze the practitioner's activities to deliver water infrastructure to informal settlements. John Forester and Donald Schön describe a practitioner as being involved in the decision-making process for an organization(s) (Forester 1984, Schön 1983). The practitioner faces many challenges political influences, client demands, policy constraints and the individual's own interpretation of the problem.

The discussion in this chapter uses themes from policy analysis and social learning in order to build a framework of the Rational Planning Model for contemporary society. Social Learning (Dewey's Social Inquiry), seen in Figures 1 and 2, has a similar process to the Rational Planning Model but differs in problem formulation and recognition. Dewey emphasizes action while the Rational Planning Model stresses the importance of a scientific method to arrive at a decision. Other theorists and academics have expanded on the differences between Dewey's Social Learning and the Rational Planning Model (Forester 2000, Friedmann 1987). I describe new interpretations of the

rational planning method and apply these new interpretations to current complex problems of water provisioning in the Global South. The concept of a municipal perspective is developed through the reflection-in-action theories of Donald Schön (1983) and the bounded rationality of John Forester (1984).

RATIONAL PLANNING MODEL

Planning is founded upon the idea of rationality; and using rational thinking to guide decisions about the future distribution of infrastructure. A dominant framework that details the role of rationality in practice is referred to as the rational planning method. Rational, an adjective, describes something that is "based on or agreeable to reason (Webster Dictionary 2004)." Reason is described as technical and scientific analysis of a situation for the end result of a decision or choice (Friedmann 1987, Schön 1983). Rationality is the act of making decisions based on reason, scientific knowledge, and the evaluation of alternatives to a specific situation. In the case study of São Paulo, the Rational Planning Model provides an evaluative framework for analyzing the planning process in the Global South.

John Dewey's steps of social inquiry, in Figure 2, also provide a foundation for the Rational Planning Model. His steps of problem recognition and formulation are used to experiment with alternatives; that experimentation creates a process of learning-through-doing in order to find the most effective strategy for the problem at hand. Despite serving as a foundation for the RPM, it is important to note that the RPM differs from Dewey's social inquiry in the following ways: First, the Dewey model develops numerous alternatives for a problem solution and adds an extra step to the evaluation of those alternatives.

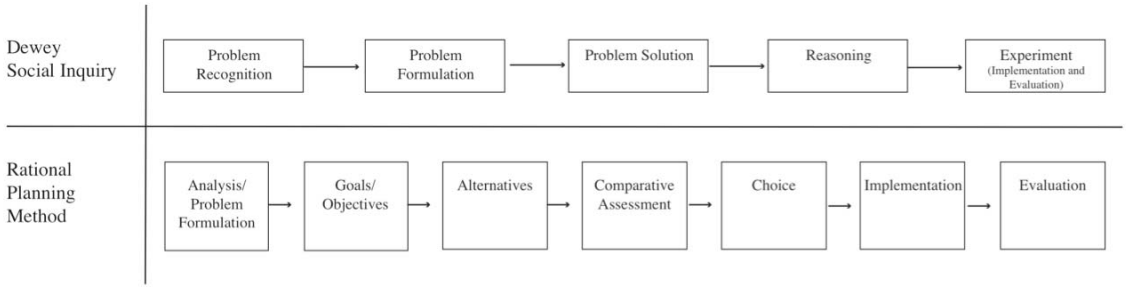

Figure 2: Comparison of the decision-making process of John Dewey's Social Inquiry and the Rational Planning Model.[7]

Fundamental to planning is the idea that scientific and technical knowledge can never be complete because they require an unbounded knowledge of the problem situation, demanding that planners obtain complete information. Complete knowledge is impossible to attain. Thus, planners impose boundaries on planning problems in the urban environment (Simon 1957 cited from Brooks 2002). This concept is referred to as Bounded Rationality:

> The capacity of the human for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behavior in the real world – or even for a reasonable approximation to such objective rationality (Simon 1957 cited from Brooks 2002, 56).

Simon's description of bounded rationality is an important component of the Rational Planning Model. Human capacity for solving problems is limited to the ability to identify those problems. Since there is a limited amount of time and information, planners must act despite information and data deficiencies.

[7] Adapted from Blanco 1994.

There are a number of steps to the Rational Planning Model largely agreed on by academics and practitioners in the planning field. Blanco (1994) provides the following description of the Rational Planning Model (see Figure 3).

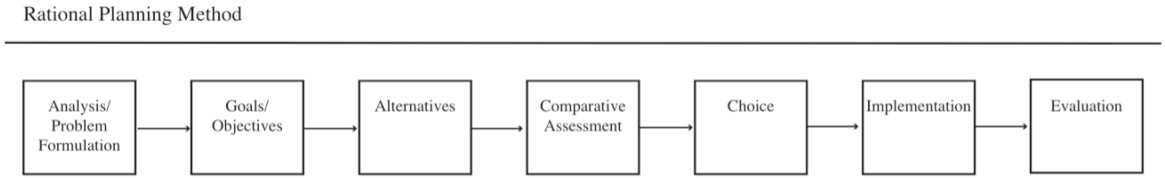

Figure 3: The Rational Planning Method.[8]

The RPM begins with an in-depth analysis of the historical development of the problems in question. Planners using the RPM must include a historical account of the problem itself, interrelated issues, the geographic and physical nature of the problem, and the social and economic processes of the problems. In order to be exhaustive, planners identify the major problems and sub-themes from multiple scales – from the resident, to the city, to the metropolitan region.

Next, planners must develop specific goals and objectives for the particular problem situation in order to establish a starting point and trajectory for the project. Goals must be general while objectives may be specific (Blanco 1994). For example, a goal might be the general reduction of traffic incidents in residential areas due to speeding where specific objective may be the implementation of speed bumps to slow down traffic and motorists. In another situation, a city may have the general goal to wants to decrease the number of water-borne illnesses in the informal settlement areas. Meanwhile, the specific objective may be to build water infrastructure to include either distribution points or residential connections for informal area residents.

[8] Adapted from Blanco 1994.

The third step, for planners using the RPM, is the identification and design of alternative strategies. Each stakeholder group proposes solutions where the interplay of bounded rationality limits the development of alternative strategies. Teams of stakeholders are tasked with incorporating multiple data sources in development of methods of evaluation and assessment.

Fourth, planners assess possible repercussions of the various alternatives. Each alternative is tested for its effect and efficacy. Agencies and organizations use case studies to determine if the alternatives are appropriate for their situations.

The fifth step calls for a decision to be made. After long deliberation of the alternatives, one set of solutions is chosen to address the problem. This is an important step in the execution and must be followed by step six, implementation. Blanco says "planning often fails when implementation begins before a plan has been fully fleshed out" (Blanco 1994, 13)

The seventh and last step includes evaluation of the plan and feedback. Evaluation occurs at all levels of the stakeholders' organization, from the community participants and residents to the technical advisory groups. Evaluation is the most important step because it allows stakeholders to reflect on the possible modifications of the selected alternatives. Evaluation provides a vital feedback loop for planners and the community involved in the development of the solution set.

THE MUNICIPAL PERSPECTIVE

Deceptively, the Rational Planning Model fails to discuss the limits to rationality. Consequently, the rational planning method has gained a negative reputation in recent years in municipalities (Alexander 2000) and has been accused of being manipulated by political forces (Flyvbjerg 2003). In the steps of decision-making, the political influence of the rational planning method is not obvious. Some scholars assess that, powerful

individuals operationalize rationality for the benefit of their own good (Flyvbjerg 2003). Specifically, they argue that individuals within advisory groups hold positions at high levels of governments and therefore have a great influence over the community.

This political influence, that permeates the RPM, can be seen in the history and development of land tenure for residents of informal settlements in Brazil. Historically, residents were removed and displaced from their homes due to failure to address the needs of low-income housing (Perlman 1976, Holston 2008). Flyvbjerg argues, however, that in a democratic society, rationality and the rational argument are one of the few forms of power low-income and disempowered individuals still have (2003). Residents can and should use the rational planning method to their advantage. Past accounts of informal settlements designing their own urbanization plans support this argument of empowerment through rationality (Perlman 1976).

Whether corrupting or empowering, politics, evident from Flyvbjerg's work (2003), hold a great deal of sway over the planning process, and especially in the city of São Paulo. Identifying the power struggle surrounding complex issues of the delivery and maintenance of water infrastructure to informal settlements can highlight the degree of stakeholder participation in the municipal planning process. Davidoff (2000) concedes that the reality of the decision-making process is laden with values imposed by practitioner is inescapable.

The question remains: Do values differ among stakeholders? Do stakeholders hold different definitions of what is considered to be a rational decision and a rational course of action? Some scholars say yes, and even go far as to say that there are conflicting notions of rationality between groups of people – municipal officials, residents and policy-makers (Watson 2003). The municipal perspective includes the roles that are framed by city planners, city officials and agencies involved in the

implementation of municipal policies. Donald Schön has said the municipal perspective is at a higher scale than a single planning practitioner (1983). Nevertheless, Schön's reflection-in-action can be applied to the municipal perspective of São Paulo and will be examined through policy documents and interviews in chapters 4 and 5. With narrative data from interviews, a municipal perspective is constructed and applied to the planning process in São Paulo. The municipal perspective is significant to the research on the impacts of rational planning in the public domain (Boyne 2001) but has yet to be explored in comparison to other interests groups' perspectives in the Global South (Perlman 1976, Holston 2008, Caldeira 2000).

Infrastructure is widely available in the city of São Paulo but management of the infrastructure has led many scholars to discuss the need for participatory methods for the management and development of water services (Porto et al, 1999, Braga et al. 2006). The 1988 Constitution and the formation of the City Statute in 2001 gave the municipality the ability to address these issues of public participation, infrastructure access, and lack of services (Macedo 2008, Holston 2004, Prefeitura de São Paulo and Cities Alliance 2008). Joseli Macedo, a professor at the University of Florida, concedes that the city has the ability to award property through adverse possession to informal settlements and cites this as a turning point significant method to positively affect low-income households and informal settlements through her work on the city of Curitiba – another major city in Brazil (2008).

Understanding the municipal perspective is important because there is a lack of research and information on the effectiveness of planning methods in the Global South, specifically in Brazil. This kind of research is necessary to explore city agency actions within this new policy framework - City Statute of 2001 and 1988 Federal Constitution – in order to conduct an in-depth analysis of their planning methods.

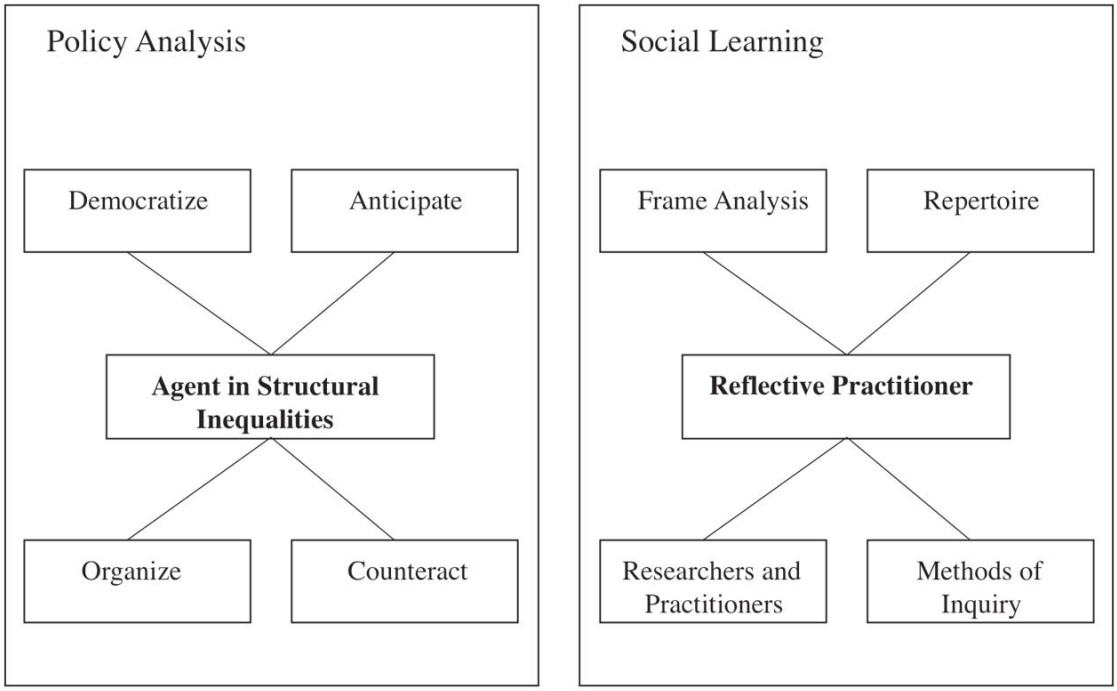

Figure 4: The Practitioner's Characteristics and Activities in the Traditions of Policy Analysis and Social Learning.[9]

Figure 4 illustrates how policy analysis and social learning provide disparate forms of action for the practitioner. Forester argues that the practitioner needs to advocate for democracy, anticipate challenges and opportunities, organize and coordinate relations between stakeholders, and act in response to power inequities (1984). According to Forester, the agent in structural inequalities may include stakeholders through the Rational Planning Model by including them in the problem analysis, goal formation, alternative assessment and strategy implementation steps (1984). In practice, the practitioner in a structural inequalities environment may be working with resident association of an informal settlement to bring positive changes for the construction of water infrastructure in its community (Forester 1984). Alternatively, Schön demands that

[9] Adapted from Forester 1984, and Schön 1983.

a practitioner re-frame her analysis at each event, create a repertoire of tacit knowledge for reference, use information from other researchers and practitioners, and develop a method of inquiry for each problem (1983). For Schön, a deliberative practitioner may be a town planner who is working with a local water provider to resolve issues of infrastructure services to all residents (1983). Schön suggests that these two stakeholders will share information and a cohesive resolution (1983). These traits make a reflective practitioner support the RPM in two ways: 1) there is a link between science and societal guidance through her method of inquiry and tacit knowledge; and 2) there is a technical process for the practitioners approach to a problem; this process is the Rational Planning Model.

Community groups and citizens may be suspicious of the Rational Planning Model because of its historical development in scientific and technical fields (Boyne 2001) but there is a new wave (Healey 2003) of ideas from planning academics and theorists that inject advocacy (Davidoff 2000), communication (Healey 2003, Forester 2000) and abductive methods (Forester 2000) into the Rational Planning Model (Blanco 1994) are on the horizon. This new perspective of planning is revitalizing the Rational Planning Model despite the history of political influence (Flyvbjerg 2003). The Constitution of 1988 and the City Statute of 2001 establish an arena for public participatory methods where political influence disappears from negotiations (Flyvbjerg 2003).

Advocacy planning, Davidoff (2000) contends, need to be a part of the rational planning process where the planner as advocate is present from steps one to five (see Figure 3). Here the ability to bring in participatory methods, community interaction and social and cultural goals can be applied. The planner is both technician and advocate for

the community. She meets with local residents to understand their goals and brings this information back to the technical advisory realm.

The Rational Planning Model is seen in a negative light often because of the political influence inherent to the decision-making process by practitioners (Flyvbjerg 2003, Davidoff 2000). To mitigate this negative perception, the practitioner herself must be examined. She herself becomes part of the municipal perspective and plays an important role in democratizing the Rational Planning process. Figure 4 illustrates the different activities within the planning process and the specific characteristics of the planner that are needed to address issues of inequality and provide the RPM with a more socially inclusive process.

INFORMAL SETTLEMENTS

> If the "right to urban planning" was formally recognized as an inherent element of social citizenship, its actual enforcement will certainly depend on the course of the broader political process in Brazil, which must make room in the decision-making process of social and urban questions for the participation of those millions of urban poor who have long been excluded (69) (Fernandes 1995).

Citizens and planners must become key advocates for the integration of technical and social data into the exploration of complex problems within the urban environment (Davidoff 2000). Across the board, more research is needed to understand how to apply the Rational Planning Model (Hostovsky 2006, Alexander 2000, Hills 2005) to the different socio-economic brackets across the Global South (Mele 2000). Some scholars have addressed the needs of residents of informal settlements in the Global South. Perlman, instructively, wrote in depth of the misconceptions of informal homesteads and argued that the rapid urbanization of Rio de Janeiro aided in the development of informal settlements (Perlman 1976).

In her studies, Perlman (1976) challenged negative perceptions of favelas noting that their development was caused by a lack of access to affordable housing and transportation – a result of the rapid urbanization process. Another anthropologist, James Holston, delivered a viewpoint of favelas falling victim to poor and complex land use policies. The development of favelas occurred in areas that had no land laws and the cities were slow to react to these new types of residences (Holston 2008). Both writers focused on urban characteristics that are part of the duties of an urban planner to address.

The 1998 Constitution, the City Statute of 2001 and subsequent federal amendments present government attempts to aid municipalities in working through and with these complex urban issues.

Similar to Flyvbjerg (2003), Holston (2000) describes a new type of citizen in Brazil - the *municitizen*. The municitizen uses her own methods to position herself in the decision-making process of her own communities. As discussed from Renata Bichir (2009), she faces public policy challenges of infrastructure access to informal settlements. Moreover, as discussed by Almeida and D'Andrea (2008), she also confronts the structural challenges within informal settlements in São Paulo in relation to city center and job access. Notwithstanding the many difficulties, even in 1976, Perlman noted the informal settlements' resilience when many communities created their own solutions to help them improve their situations.

One of the main challenges municitizens must confront are institutional barriers to services. Joining da Gama Torres, Bichir (2009) addresses the spatial segregation of the poor in the city of São Paulo. In doing so, they discuss the level of services (sewer and water) available to these populations and conclude that institutional barriers are the main cause of the lack of services (da Gama Torres and Bichir 2005). They agree with Flyvbjerg's argument that political power is influential in the planning arena, Bichir and

da Gama Torres (2005) also concur that state investment patterns can be explained by the political party interests. Marques (2003), in turn, labels the politically-influenced actions as "hierarchical selectivity." Studies done by those like Marques et al. (2003) focusing on the personal networks of informal settlements at the center of metropolitan studies in the city of São Paulo are key to bridging public policy and the possibility of improving the urban landscape.

CONCLUSION

Planning "attempts to link scientific and technical knowledge in the public domain" (Friedmann 1987, 38). Planning has historically been related to the rational planning method – a scientific and technical analysis approach to decision-making. This method, however composed, has unforeseen obstacles such as political influences, ignorance of the Global South and the neglect of marginalized groups in the planning process.

In the following chapter, I describe and detail the planning process in São Paulo through legal, technical planning and public participation frameworks in order to understand the delivery and maintenance of water infrastructure to informal settlements.

Chapter 4: Planning Frameworks and Process in São Paulo

THE MUNICIPAL PERSPECTIVE

> *In a way, São Paulo is a different city and different, with its limits far more extensive than those contained on maps. It is a transmunicipal, which greatly expands its features and responsibilities* (Prefeitura de São Paulo 2006).[10]

The city of São Paulo has an extensive system of infrastructure that reaches over 96% of the population (Prefeitura de São Paulo 2006). According to the current population data, the city and SABESP fail to service 400,000 inhabitants each year. The city and SABASP are obligated to cover 100% of the city, almost half a million lack coverage including the 22 percent that live under the federal poverty levels (Prefeitura de São Paulo 2006). As illustrated in Table 6, this groups is composed primarily of individuals who are homeless, reside in informal settlements or irregular settlements. In this chapter I describe city interacts with low-income residents; city policies that support the provisioning of public services to this group. Specifically, I explore access to water infrastructure for low-income residents.

Priority Housing Needs					
Indicators	Informal Settlements	Irregular and Low-Income Settlements	Public Housing	Tenements	Homeless
Population	1,160,597	1,062,158	89,760	38,512	8,706
Households	291,983	283,476	24,000	14,617	3,212
Habitants per Household	3.97	3.74	3.74	2.63	2.71

Table 6: Priority Housing Needs.[11]

[10] Translation by Author.

[11] Translation by Author, adapted from Prefeitura de São Paulo 2006.

This chapter details how the federal and municipal governments address the social inclusion of low-income residents in the planning process; and in particular, water infrastructure. Table 7 lists the agencies involved at each level of government in the planning process in São Paulo.[12] First, it addresses the Legal Framework established by the Constitution of 1988 lead to changes of the management of urban cities. Second, it takes on the Technical Planning Framework quantifiable approach for the assessment and selection of informal settlement areas for water infrastructure improvements. Next, it addresses the Public Participation team works with residents to promote social inclusion in the urbanization process. Finally, I focus on how the social organizations of the informal settlements can initiate water services for their communities (see Figure 5 for planning frameworks in the São Paulo Planning Process).

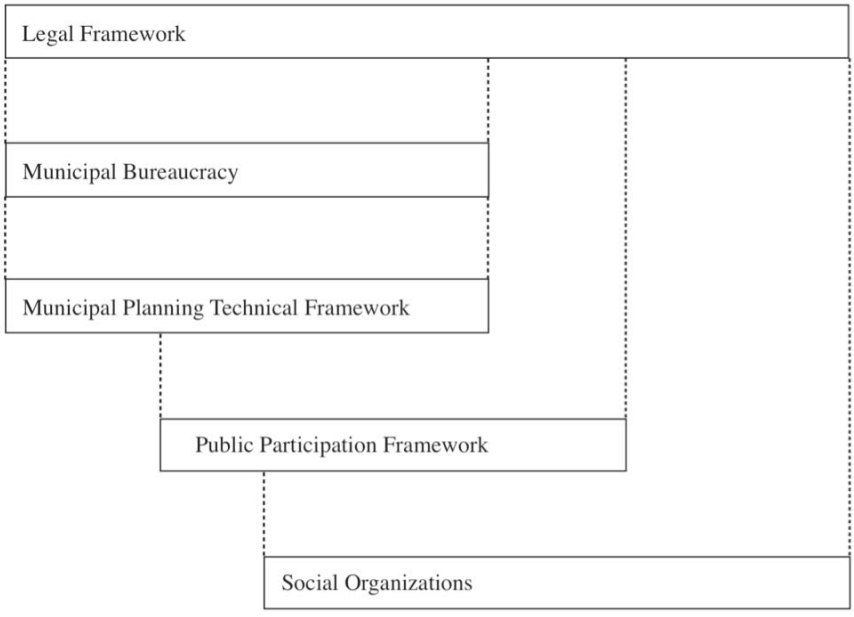

Figure 5: Frameworks involved in the Sao Paulo Planning Process.[13]

[12] See Glossary for acronym and complete agency name.
[13] Adapted from Friedmann 1987. Social Organizations describes the self-organization of residents in informal settlements for the attainment of water infrastructure services.

Legal Framework

In the following section, I will explore how the Constitution of 1988 addresses the welfare of city inhabitants. I, further, examine how the City Statute of 2001 mandated master planning for major cities (Brazilian Constitution 1988, art. 182). Each legal document in turn helped to foment an environment that allows municipalities to address their specific problems.

Federal Constitution

Prior to the passage of the 1988 Constitution of Brazil, the federal government controlled of the size of cities. It determined the appropriate sizes for cities (small, medium, large), based on the public services and amenities available in that city (Perlman 1976, Holston 2008). This urban planning method led to a lack of municipal control over the peripheral urban areas where informal settlements have historically occurred. When the Federal government approved a new constitution in 1988, it emphasized equality and social rights and gave control of city growth to the municipalities. It saw how the lack of municipal control over peripheral areas had exacerbated the development of housing that lacked any urban infrastructure. Powerless, the cities could not regularize housing developments nor deliver transportation outlets for these areas (Holston 2008).

The new constitution established broad foundations for the development of a more socially progressive urban policy for Brazil. For example, Article 5 of the constitution states the following on equality:

> XI. The home is the inviolable asylum of the individual, and no one may enter it without the dweller's consent, save in the case of "*flagrante delicito*" or disaster, or to give help, or, during the day, by court order (Brazilian Constitution 1988, art. 5, item 11).

The question then becomes, does the city of São Paulo consider the dwellings in the informal settlements "homes." The legal framework does not provide a definition for

the home. The federal government leaves this definition for the city. The city of São Paulo, in the following section, supports a concept of "progressive living solutions" in reference to informal settlements thereby acknowledging the lack of housing in the municipality (Prefeitura de São Paulo 2006). Article 6 continues to define in greater detail the "Basic Principles" of a Brazilian citizenship.

> Education, health, work, leisure, social security, protection of motherhood and childhood, and assistance to the destitute, are social rights under this Constitution (Brazilian Constitution 1988, art. 6).

Here, the Constitution emphasizes the importance of basic foundations for citizens. Article 7, item four, developed a focus on the financial needs of the citizen through the establishment of a minimum wage.

> IV. A minimum wage nationwide, established by law, capable of satisfying their basic living needs and those of their families with housing, food, education, health, leisure, clothing, hygiene, transportation, and social security, with periodical adjustments to maintain its purchasing power, it being forbidden to bind it for any purpose (Brazilian Constitution 1988, art. 7, item 4).

This minimum wage must aid the citizen to achieve the "Basic Principles" in Article 6. Housing is mentioned for the second time in the constitution and is later, in article 182, related to the municipality in the Constitution through the development of a Master Plan.

Article 182, called "Municipal Urbanization," of the Constitution created three important municipal powers related to urban processes. The municipal powers create planning tools address the development of informal settlements.

> (0) The urban development policy carried out by the Municipal Government, according to general guidelines set forth in the law, is aimed at organizing the full development of the city's social functions and ensuring the well being of its inhabitants.

> (1) The master plan, approved by the City Council, which is compulsory for cities of over twenty thousand inhabitants, is the basic tool of the urban development and expansion on policy.
>
> (2) Urban property performs it s social function when it meets the fundamental requirements for the city's organization as set forth in the master plan.
>
> (3) Expropriation of urban property is made against prior and fair compensation in cash.
>
> (4) The Municipal Government may, by means of a specific law, in relation to areas included in the master plan, demand, according to federal law, that the owner of unbuilt, underused, or unused urban soil provide for adequate use thereof, subject, successively, to:
>
> > I. Compulsory subdivision or construction;
> >
> > II. Rates of urban property and land tax that are progressive in time;
> >
> > III. Expropriation with payment in public debt bonds issued with the prior approval of the Federal Senate, redeemable within up to ten years, in equal and successive annual installments, ensuring the real value of the compensation and legal interest (Brazilian Constitution 1988, art. 182, amend. 26).

First, the constitution gives the municipality the authority to enact laws governing the use and development of urban areas. The cities have two social obligations: 1) to guarantee the "full development of the city's social function" and 2) provide for the "well-being of its inhabitants." The first social obligation has been interpreted as a social right to housing. Amendment 26 of article 182 adds the right to housing, education, health, enjoyment, and homelessness assistance. In amendment 26, the city is mandated to produce a master plan for cities of 20,000 inhabitants that guarantee the social well being of the residents and support the "Basic Principles" of Brazilian citizenship.

Second, the private right to property is awarded with the condition that it accomplishes a "social function" according to the city's master plan. This means that private landowners must support the city's master plan by adding a key element of

"social benefit" to the city. Placing of a high polluting industry adjacent to a residential area or educational center, for example, would violate amendment 26.

Third, the federal constitution awards the right to adverse possession (*Usurpição Urbano*) in Article 183. The article states:

> An individual who holds as his own an urban area of up to two hundred and fifty square meters, for five years without interruption or opposition, using it as his or as his family's home, acquires title to such property, provided that he does not own any other urban or rural property.
>
> (1) The deed of title and authorization of use is granted to the man or woman, or both, regardless of their marital status.
>
> (2) Such right shall not be recognized for the same holder than once
>
> (3) Public real property shall not be acquired by usurpation (Brazilian Constitution, art. 183).

This law is only applicable to privately owned land under 250 square meters that has been occupied without opposition for five years. This particular law was a major step for informal settlements by allowing municipalities to create legal instruments and processes for residents to secure land title and rights to one occupied private property on which many of them have resided for years, unopposed.

The development of this urban policy highlights the right of non-governmental organizations to formulate bills on urban matters, identifies the need for regional planning, and the right to live in a properly planned and socially oriented city. But most importantly, the constitution recognizes the political nature of the decision-making process regarding property in terms of economic opportunities and exploitation.

Why is the legal framework important? The constitution of 1988 and its subsequent amendments establish rules and regulations that municipalities can adapt to create their own planning processes. Further, the constitution establishes the "Basic Principles" right that allows municipalities to implement strategies supporting the welfare

of its' citizens through housing, education, health and income. This federal legal framework, inherently, is a political product - a historical and political creation that shapes city planning in Brazil.

Addressing the political nature of city planning, Flyvbjerg (2003) found political forces create change for their own benefits. Holston (2008) and Perlman (1976), however, have shown that political influence maybe advantageous for residents of informal settlements. The federal legal framework of Brazil provided by the constitution now supports rules for decision-making regarding water infrastructure that focuses on the well being of Brazilian citizens. Placing importance on the welfare of citizens, broadly speaking, produces a greater burden on municipalities to enact a comprehensive plan and to provide necessary social services.

Municipal Bureaucracy

Shortly after the passing the new constitution, a new bill called the "*Estatuo do Cidade*" or the City Statute was introduced into law. It was an urban development policy bill created in 1990 that was completed and ratified in 2001 (Fernandes 1995, Macedo 2006). The bill enforced the regulations in the constitution (Articles 182 and 183) and set guidelines for the following urban plans, development tools, taxation strategies and special districts. Further, it mandated municipal planning for cities with over 20,000 inhabitants. In addition to permitting land use management tools for construction and development of vacant lots, it gave the municipality zoning powers for areas of social interest (Brazilian Constitution 1988, art 182 and 183).

The City Statute creates a number of legal instruments to support the efforts of a master plan. The first instrument established is the "grant right to use" for areas of tenements, informal and irregular settlements on publicly owned land. The "grant right to use" allows residents to occupy the area permanently and permits city improvements to

occur in these areas. Improvements include things such as the rehabilitation of dilapidated housing and the construction of water infrastructure. Lastly, environmental and neighborhood impact reports address another dimension of the urban space concerning possible pollution or adjacent contradictory uses. The environmental impact reports provide a regulatory and "social" function for Article 182 and the Article 6 of the Basic Principles of Brazilian citizenship.

The city of São Paulo has interpreted the City Statute by shaping a number of its city laws and objectives to cater to the needs of the municipality and the inhabitants. The City wants to establish itself as "a regional center, an international center and an economically active center" for the development of employment and income growth (Prefeitura de São Paulo 2006, 5). According to the 2006 *Plano Plurianual* (Multi-Year plan), the term rational is used to describe the development of an integrated system:

> Two aspects of the noted strategy adopted by the *Plano Plurianual*: a management effort, focusing on the responsible use of rational structure already available, maximizing the potential of service it can provide to the population; a focus on investment corrective integration between the various equipment already available, integrating them into a whole system capable of multiplying their generating capacity of welfare for the population (Prefeitura de São Paulo 2006).[14]

This strategy for the city is illustrative of the technical decision-making process through the use of reason and rational planning that has supplanted itself in the Global South. Bolded agencies reflect those discussed in my research.

[14] Translation by author.

Scale	Public Agency integration of Housing Policy	Agency responsible for Political Coordination	Agency responsible for Political Operations	Management and Planning Instruments
Federal		Ministry of Cities, Secretary of National Housing	CAIXA	SNHIS
State	**SABESP** SEMA	State Secretary of Housing	**CDHU**	Guarantor of Housing Funds CEH FMH
Municipal	**SEHAB** SMADS SMSP SVMA SMPP SMTrab	SEHAB **HABI** RESOLO	**COHAB**	CMH PMH

Table 7: Government agencies involved in the São Paulo Planning Process.[15]

The city efforts emphasizes the necessary coordination amongst organizations and the great importance of the inclusion of all stakeholders. The inclusion of all agencies is key to the successful implementation of a strategy. Implementation is a key component of the Rational Planning Model.

> The PPA (*Plano Plurianual*) provides for the intensification of land regularization programs, urbanization and regularization of slums and removal of families, especially in the areas of risk. It also included the overhaul of housing programs for joint efforts, revitalization of areas of low population settlement, densifying where this is possible, eliminating slums, renovating housing, coordinating with other agencies - federal, state and local authorities, notably the Federal Savings Bank - and customizing works, adapting them to the reality of the communities they serve (Prefeitura de São Paulo 2006).

Building off of this technical rationality, the city has created the following objectives (Bolded objectives are specific strategies related to the Rational Planning Model for the city of São Paulo).

[15] Adapted from Prefeitura de São Paulo and Cities Alliance 2008. Bold agencies are those discussed in this research project.

(1) Installation of a housing information system

(2) Implementation of a monitoring and evaluation system for housing policy

(3) Criteria of Selection and Classification of Benefits

(4) Land Survey Institution

(5) Implementation of new housing projects

(6) Support of progressive living solutions

(7) Action of approval and regularization of housing projects

(8) Improve the quality of public works

(9) Appropriation of costs and value attribution of payment

(10) Commercial alternatives and other forms of occupation

(11) Financial system, location and payment of services

(12) Application of political subsidies

(13) Action in informal settlements and other forms of degradation

(14) Incentive for private initiative of the Program of Downtown Revitalization Program

(15) Institutional Development of technical operations (Prefeitura de São Paulo 2006).[16]

Objectives 1 and 2 grow out of the city's assessment and evaluation stages for those problems related to irregular and informal settlements. Objective 5 and 6 parallel the implementation step of the Rational Planning Model. Objective 6 is a strategy specific to São Paulo, which focuses on the various living situations many residents use to accommodate themselves. The city recognizes these housing solutions and legitimizes their place in the urban environment of São Paulo through these particular objectives.

[16] Translation by author. Bolded objectives are directly related to my thesis.

Tenure Regularization Policies and Tools

The municipality now, after the adoption of the 1998 Federal Constitution and the 2001 City Statute, has been given the right to plan for the social well-being of its residents. Fundamentally, it can plan for housing, education and health. Within this panoply of rights, the city is able to zone areas for social interest called ZEIS, *zona especial de interesse social* or zones of special social interest. The city is allowed to rehabilitate dilapidated building stock (tenement housing), urbanize informal settlements and decide the scope of lot sizes for division, types of allowed uses and the various types of occupation under a series of flexible guidelines or parameters. These flexible parameters help the city target important areas occupied by informal settlements in environmentally precarious or sensitive situations or settlements characterized by high social vulnerability indicators. In the case of the study site, Paraísopolis, it is located in a hilly area of the city, is 100 hectares, holds a population of approximately 60,000 and is the second largest slum in the city of São Paulo.

The second tool for tenure regulation is the adverse possession (*usurpção urbano*) law formulated in the 1998 Constitution. Low-income families of informal settlements or irregular settlements are able to acquire their occupied property through legal processes. Adverse Possession is only allowed with regard to private properties and includes these restrictions: residents must occupy a property with more than 250 square meters; the occupant must have lived uninterrupted there for five years with intention to own; and the resident must not own any other property - rural or urban.

MUNICIPAL PLANNING FRAMEWORK

In the following section, the Technical Planning process and the Public Participation framework will be discussed. Each has its own process for urbanization of informal settlements but differs in the type of activities. It focuses on the Technical

Planning process produces quantitative results for the prioritization of informal settlements while the Public Participation framework aims to socially include residents in the design and construction stages of the urbanization improvements.

The Technical Planning Process

The legal toolbox provides a necessary platform in which planners and city officials are able to improve and act upon processes within the municipality. Sao Paulo city planners have created a quantitative approach to the delivery and provisioning of water infrastructure to informal settlements. The overall technical planning process is outlined in Figure 6. The city of São Paulo designates this work primarily to the following municipal agencies: HABI, the low-income housing authority; and RESOLO, the City Subdivision Regularization department.

HABI established a website, HABISP, which is the technical arm of HABI to support the cataloging of housing and resident information, and the display of mapping information. HABISP was set up under the auspices of the *Sustainable Planning, Financing and Implementation of Low-Income Housing and Urban Development Policy* agreed to by SEHAB and Cities Alliance, an international non-governmental organization (HABI 2008).

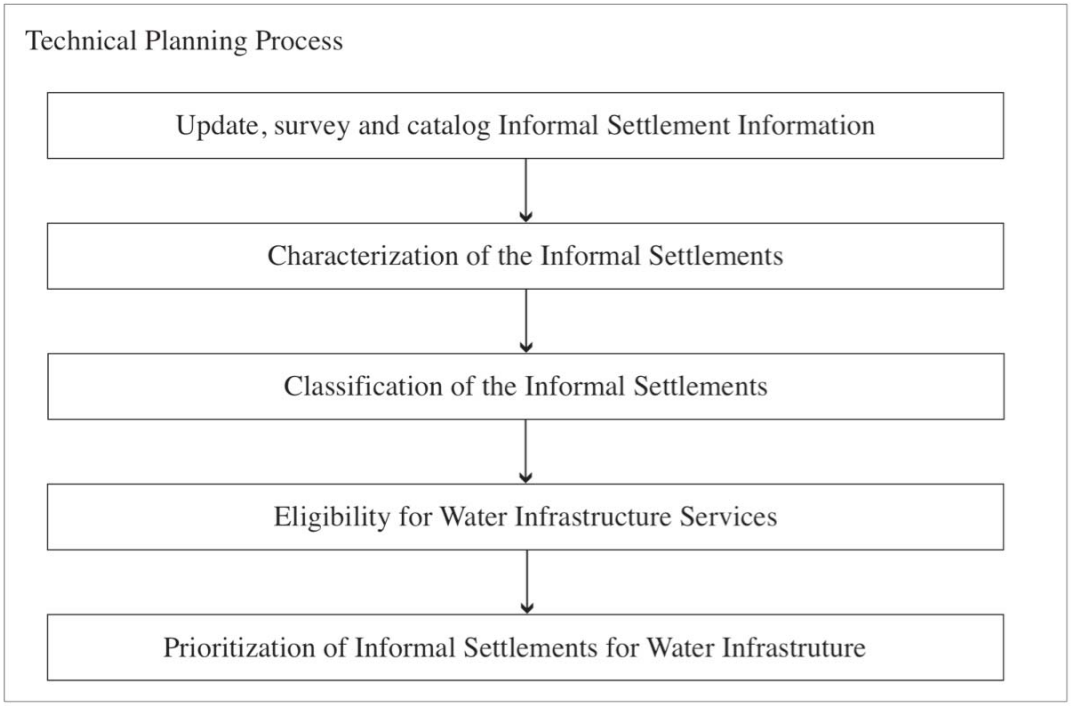

Figure 6: Technical Planning Technical Framework

HABI acts first to collect and update information on all settlements in the city. In particular, they pay close attention to precarious, informal and irregular settlements - the last update of those settlements occurred in 1987 (HABI 2008). Precarious settlements encroach on environmental resources such as water sources or on areas of ecological conservation. Some of these types of settlements are associated with private or public land invasions. The designation of private and public land invasions determine the legal instruments HABI and RESOLO can use for tenure regularization and settlement urbanization. Figure 7 outlines this process.

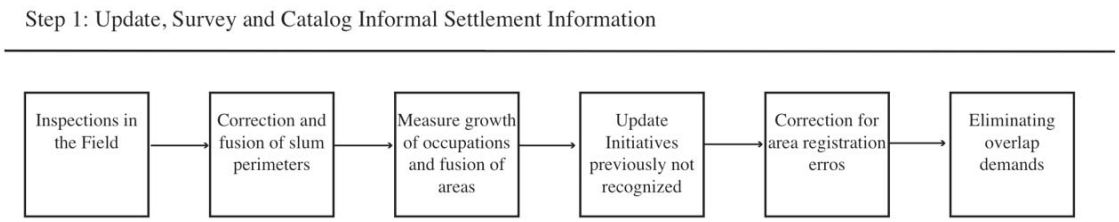

Figure 7: Update, Survey and Catalog Information Process.[17]

Once an area is identified and catalogued, surveys are distributed to the residents. Information is gathered that includes household size, income, educational attainment levels, health history, literacy and ages of all occupants. These data sets then are compared with IBGE information. Any overlaps or contradictions are revised for easy transition into statistical and spatial analysis software programs such as ArcGIS, that allow HABI to complete its analyses, including characterization and classification of settlements.

[17] Adopted from the Planning Instruments, HABI 2008.

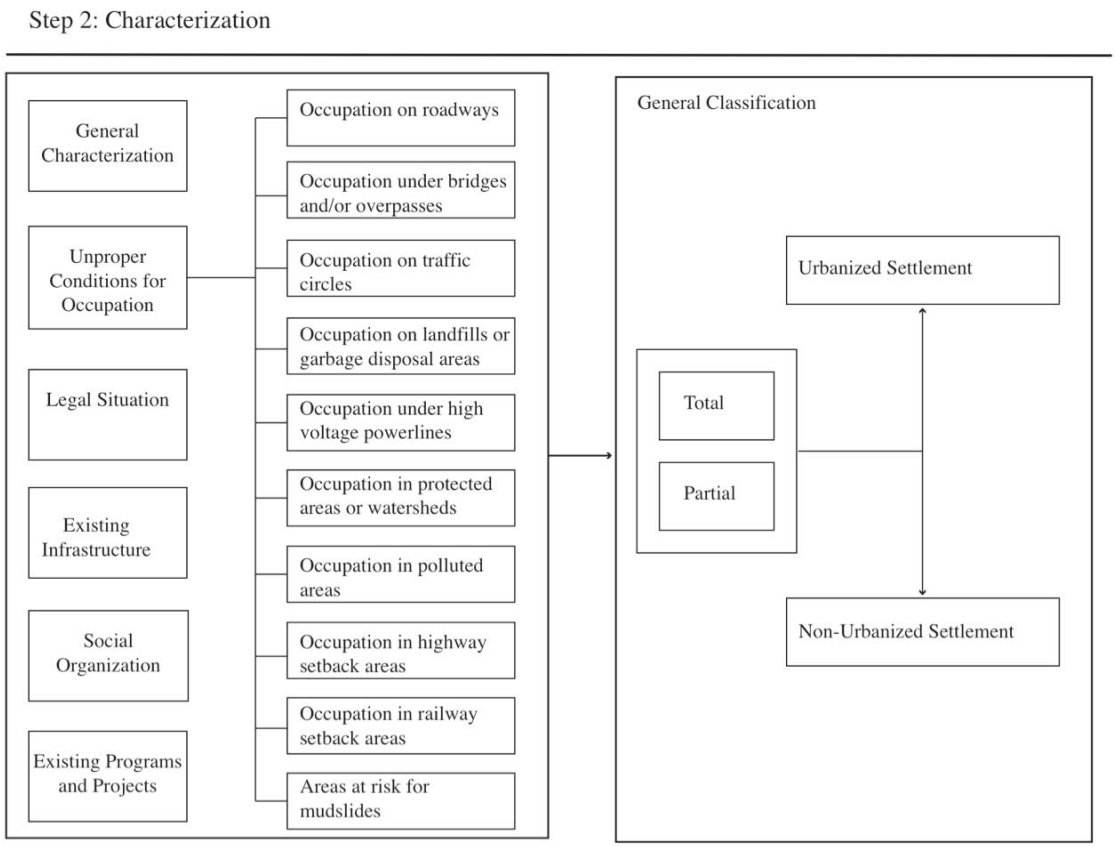

Figure 8: Characterization Process.[18]

HABI implements a characterization process for the settlements where improper conditions of occupation existed. These areas include developments on roadways; under bridges; on overpasses; on traffic circles and islands; on sanitary landfills; under high voltage cables; on pipelines; on restricted areas; on watersheds; in polluted areas; in railway areas; and on areas with mudslide dangers are evaluated (see Figure 8). HABI also evaluates the legal situation (public or private land occupation, history of title) of any existing infrastructure, popular community organizations and any existing programs of urbanization (HABI 2008).

[18] Adapted from the Planning Instruments, HABI 2008.

HABI's characterization leads to the classification stage seen in Figure 9. The five types of areas are defined as:

(1) *Urbanized and regularized residential areas* – an informal settlement with transportation access, social services, water, electricity, sewage and trash services.

(2) *Urbanized residential area* – these areas have the following services: water, electricity, sewage and trash; but lack transportation access and social services.

(3) *Slum urbanization in progress* – areas undergoing an urbanization process

(4) *Urbanizable slum* – an informal settlement with no services and has the possibility for urbanization

(5) *Non-urbanizable slum* – an informal settlement that is in an area of environmental concern (i.e. health risks) and has a high risk of floods and mudslides (HABI 2008).

After classifying the informal settlements in one of these five categories, HABI assesses eligibility of the informal settlement for the regularization process, which is associated with deciding what kinds of infrastructure can be provided to the classified settlements.

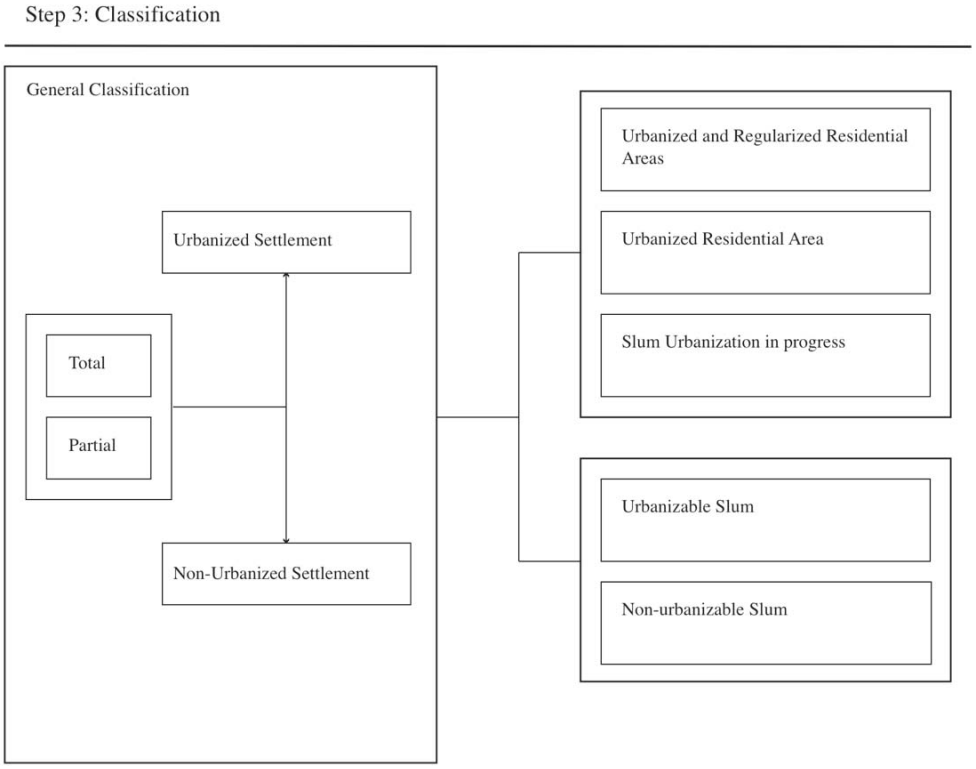

Figure 9: Classification Process.[19]

If the informal settlement is urbanized, regularized and integrated into the city, HABI only monitors services and benefits of the city integration. If the informal settlement is an urbanized residential area; if slum urbanization is underway; or if it is an urbanizable slum, HABI moves forward to a tenure regularization process and registration or urbanization. If the informal settlement is a non-urbanizable slum, HABI will suggest removal of the informal settlement. The non-urbanizable slum is then left with two options: 1) move to a safer location where landslide and flooding risks are minimal; or, 2) continue to live in precarious conditions. If they continue to live in the non-urbanizable settlement, residents will be in danger of water pollution, as well as

[19] Adapted from Planning Instruments, HABI 2008.

landslide and flooding risks. During the summer months of this year, São Paulo had sixty-five residents die due to flooding and landslides (Folha de São Paulo 2010).

Once the process of classification is complete, HABI then prioritizes the types of infrastructure needed and the kinds of services required. Primary criteria include infrastructure services such as water supply coverage, sewer coverage, electrical appliances, public street light system, storm water and drainage systems, paved roads and garbage collection. The second set of criteria prioritization is management tool to combat the risk of mudslides. HABI does a topographical survey and spatial analysis to determine if the informal settlements are at low, medium, higher, or very high probabilities of incurring landslides or floods.

A third set of criteria involved in prioritizing the types of infrastructure includes the social vulnerability index for the city of São Paulo (SEADE 2003). The social vulnerability index looks at the education attainment of the head of household, number of household incomes higher than three times the minimum wage (current dollar conversion $263/month, Reuters 2009), average nominal income of households, percentage of adults who are literate, average age of adults, adults 20 and older, and percentage if children under four years of age per total residents of the informal settlement. Figure 10 outlines this step of prioritization.

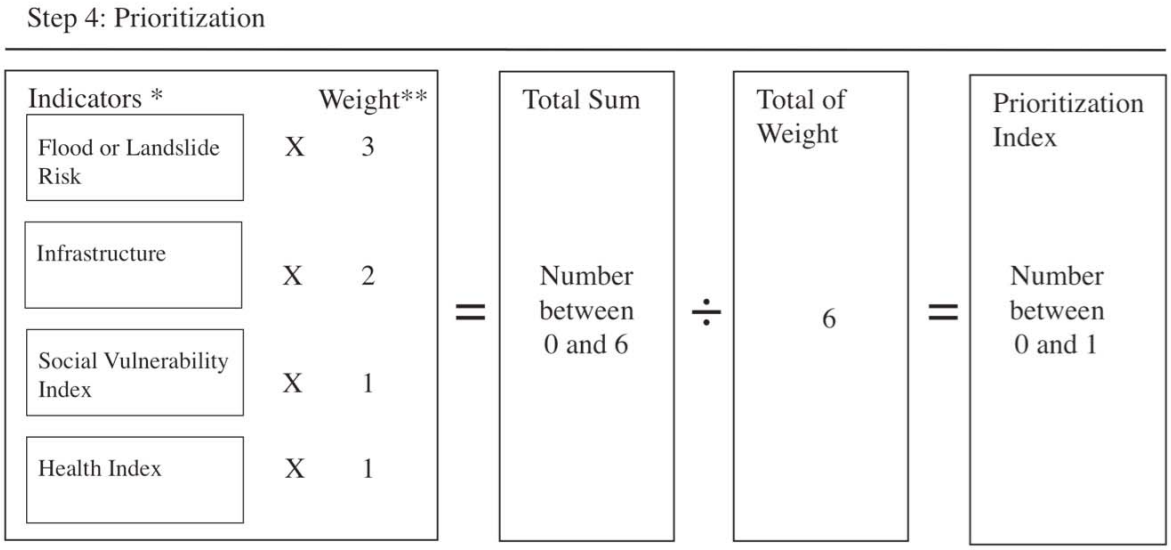

Figure 10: Prioritization Index Calculation.[20]

Each of these indicators are weighted, summed up for informal settlement areas, then ultimately calculated for a prioritization index. The resulting calculation is used by the city to select specific programs for the areas. This method of managing and regulating the distribution and allocation of infrastructure is driven by a quantitative determination of the needs of informal settlements in the city of São Paulo. The prioritization process, many argue, is considered to be transparent and is available online for public viewing (see Appendix B). The question then becomes, do residents living in the various legal and illegal settlements have access to computers and can they understand how various kinds of infrastructure is prioritized for their settlement?

[20] Adapted from HABI 2008.

Public Participation Framework

The public participation framework, developed by HABI and Cities Alliance, encourages community involvement in the planning process for water infrastructure delivery to informal settlements (see Figure 11). During the technical planning process, the public participation framework begins to work with the characterized and cataloged informal settlement. HABI and Cities Alliance uses the term social work to describe their participation framework. It is defined: "an ongoing process monitored by a system of indicators that commences at the planning and project design stage and continues throughout the works phase and is only concluded after an interim period following conclusion of the works" (Cities Alliance 2008, 3). This statement of purpose sets boundaries for the goals and action stages of design and construction, in such a way that each step is related to the social work purpose.

Social work activities function alongside the project design and construction stages of an informal settlement in two ways. First, the project design stage requires the social work activities to include identification and contact with the community; survey of all families and properties; discussion of findings with the community; discuss proposals for improvements; evaluation of community responses; and presentation of final project alternatives for the neighborhood. Specific goals include:

(1) To guarantee access to information

(2) To encourage public participation by the population

(3) To contribute to organizations and management of the spaces

(4) To instill in people attitudes that will benefit the environment

(5) To train people to manage and preserve the improvements made by the city

(6) To increase people's knowledge of the laws and public policies related to urban and social questions

(7) To focus on the need for social inclusion (Cities Alliance, 2008)**.**

The goals bolded above are those most relevant to my research and to the Rational Planning Model because they address the lack of attention to public participation. The first goal makes clear access to information in not limited to designers and project leaders; the community has access to it as well. Goals 2 and 7 encourage the inclusion and participation of the community. As Flyvbjerg, the involvement of disempowered individuals will democratize the process for decision-making. Democratization and social inclusion are two main actions the deliberative practitioner and agent may utilize to reform structural inequalities (Schön 1983, Forester 1984).

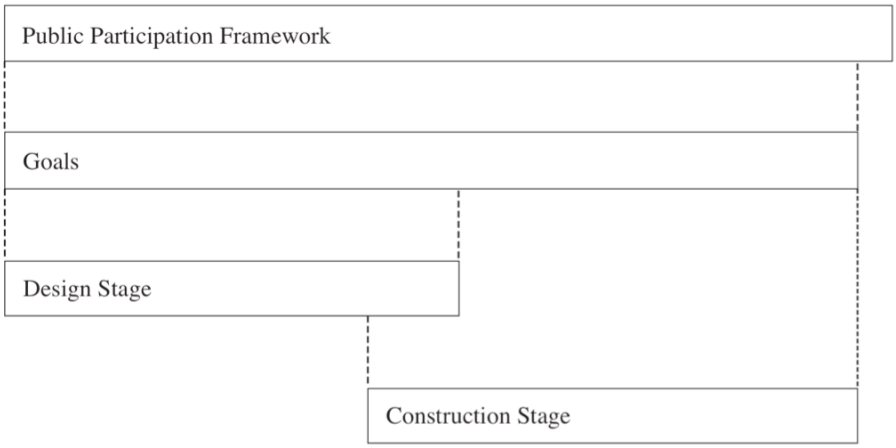

Figure 11: Public Participation Framework.[21]

The second step of the public participation objectives is enacted during the construction stage. Step two prepares the community for construction changes, prepares "work fronts" for public participation and mapping of the proposal, removal of families

[21] Adapted from Friedmann 1987.

to other accommodations, and tracking these families for resettlement. “Work fronts” (a type of charette) is a termed coined by Cities Alliance and the city of São Paulo for the public meetings with residents held in the informal settlement areas.

The next step is the complete removal and demolition of the homes to make way for the urbanization process. Here, on going “work fronts” educate residents about the management and preservation of the future improvements. Agents from SABESP, CET and HABI discuss tenure rights, utility billing process, socio-economic tariffs, and safe water use (Accioli 2010, Henrique 2010, Almeida 2010). The families removed are given provisional accommodations handled by the city agency, HABI, to live in during the construction stage. After construction, families are then returned to their new homes where HABI monitors the informal settlement, including the families who relocated.

The monitoring process occurs at two different scales. The first is developed from the UN-HABITAT millennium development goals. The second is developed from a set of indicators that was created by the City of São Paulo. HABI officials continue to survey households after the urbanization process, monitoring the household’s process of land tenure and water consumption practices (Cities Alliance 2008). On the two scales above, changes in household density, education attainment levels, and incomes are noted and supervised. For comparison, non-urbanized slums are also surveyed regarding similar characteristics to provide a comparative analysis tool of negative and positive attributes of the urbanization process.

SOCIAL ORGANIZATIONS

According to interviews conducted with SABESP officials and a private contractor (COBRAPE), informal settlements use a range of approaches to obtain water infrastructure. One of the most discussed methods of infrastructure appropriation is land invasion. Land invasion is the illegal occupation of a private property. If the municipality

or state owns the land occupied by informal settlements, the city has the ability to plan for an intervention. If the land occupied by the informal settlement is owned by a private entity, the city and the water sewer agency (SABESP) are only able to intervene with an urbanization process through court order or by request from the landowner. Hence, the lack of power for SABESP prolongs the waiting period for needed water infrastructure and pushes residents to use informal or illegal means to obtain potable water.

Another process for obtaining water services in an informal settlement centers around creating an illegal connection to a water main (Almeida 2010, Henrique 2010). Residents of the informal settlement purchase construction supplies to create a connection to a local main from SABESP (Almeida 2010). In turn, SABESP locates areas that have illegal connections and attempts to establish community ties with local leaders in hopes of initiating an urbanization process (Azevedo 2010). SABESP identifies local leadership and convenes meetings for purposes of education, understanding community concerns and discusses the prospect of further urbanization projects. SABESP, cannot start an urbanization process, because it is legally obligated to cover all of the city's inhabitants with potable water infrastructure (Lacerda 2010), it reaches out in this way.

There are two active approaches used by urbanizable informal settlements to obtain water infrastructure. They are both similar but differ in level of organization. First, informal settlement unions may request infrastructure services directly from the city or SABESP (Almeida 2010, Holston 2008). These groups hold strong political sway when their requests are made during a city election period. They strategically approach political candidates for help gaining public services and, in turn, agree to increase voter support for that candidate (Henrique 2010, Almeida 2010).

Informal settlement organizations have appeared in reaction to the political influence of the Rational Planning Model through self-organization and request for

infrastructure services. The other active approach that informal settlements use centers on socially including themselves in the planning process, thereby empowering the community to advocate for itself. This empowerment process of the informal settlement is a specific strategy of Brazilian informal settlements and is an essential characteristic of the Rational Planning Model in the Global South (Flyvbjerg 2003, Holston 2008).

Occasionally, individual requests for services from the informal settlements motivate change. When this happens, a community agent from SABESP will contact the individual and with her develop ties in the community to motivate a larger urbanization process. Mr. Daniel Henrique, SABESP Service Director, stated that officials respond because the city is obligated by law to provide city services such as water and sewer infrastructure to 100% of the population (Henrique 2010). Often, the process begins with the evaluation of social tariffs for the settlement. It allows households to pay rates and legitimize rights to the city (Henrique 2010, Holston 2008).

At the largest scale, environmental concerns stipulate city government reaction concerning the ability of informal settlements to undergo an urbanization process. Environmental considerations center on encroachment on watersheds, reservoirs, streams and rivers that are part of the city's water resources. When this type of encroachment occurs, the city-planning agency will determine if an intervention is necessary. If it is, the city officials then begin to establish community relationships with informal settlement leaders in order to begin a participatory urbanization process.

CONCLUSION

The planning processes in São Paulo are shaped by three major municipal frameworks and one externally organized framework. First, the Brazilian Constitution has given the city a diverse tool set to plan for infrastructure services for informal settlements by declaring them social rights. The federal government has also created a flexible policy

environment allowing for the creation of the City Statute and the development of a tenure regularization process – these legal instruments obligate the city to deliver water services to residents. The municipality of São Paulo has implemented a set of objectives based around the idea of technical rationality for their own purposes - the most important being the regularization process of informal settlements. Through a quantitative and digitally accessible process, informal settlements are selected for water provisioning. Moreover, the public participation framework operates alongside the planning processes so that residents have access to information, are involved in the water provisioning decision-making process, and are committed to the changes in their communities. Lastly, the informal settlements are able to take the lead advocating for their needs of water infrastructure. They can, as individual residents, illegally tap into main water line for potable water. They are able to organize as a community to create their own community wide infrastructure through the pooling of resources to illegally tap into a main water line. In addition, they can organize as a resident union to sway politicians for services. Attempting to understand these frameworks in the Rational Planning Model, the following chapter highlights the similarities and differences amongst these planning methods.

Chapter 5: Analysis

RATIONAL PLANNING IN SÃO PAULO

In chapter 3, the Rational Planning Model is described as a technical and reason-based process of decision-making. Subsequently, Chapter 4 discusses the legal, technical planning, and public participation frameworks established in the city of São Paulo for the implementation of water infrastructure to informal settlements. This chapter, chapter 5, discusses how the planning processes discussed in chapter 4 converge and diverge with the Rational Planning Model. It explores whether there is anything inherently different in a planning process associated with informal settlements. Further, it explores the municipal perspective of the city of São Paulo, and how this perspective operates in the context of the Rational Planning Model.

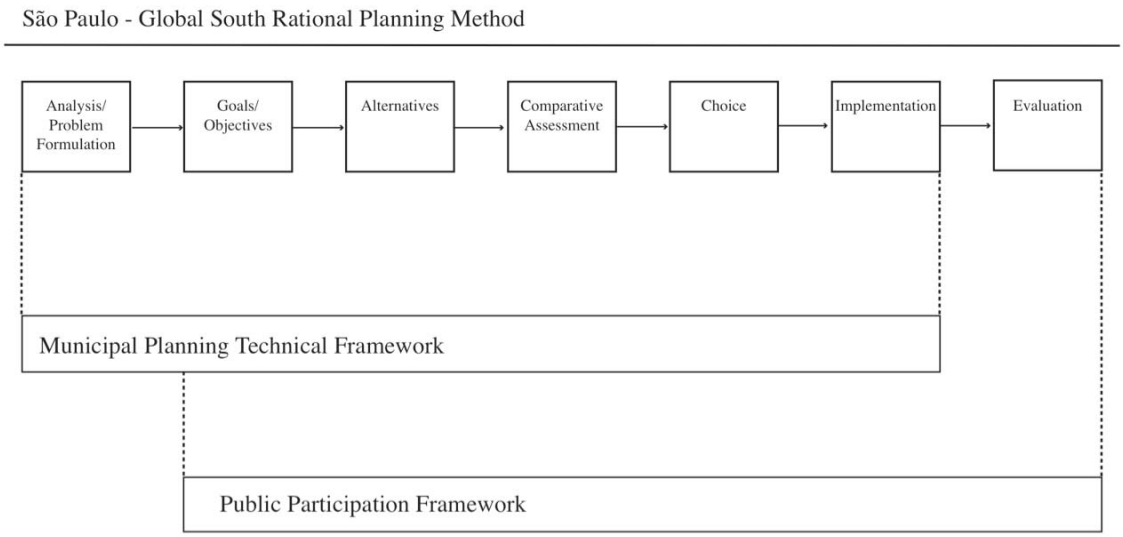

Figure 12: The São Paulo Rational Planning Model.[22]

[22] Adapted from Friedmann 1987.

By exploring the steps in which the city plans for water infrastructure, the Rational Planning Model works as a guide for observing the planning process in São Paulo. The primary difference found in my research between the RPM and planning in the Global South is the role and activity of the practitioner. From the interview data, the research reflects that a municipal perspective is developed from public and private agencies. The municipal perspective of São Paulo uses a combination of Forester and Schön descriptions of the practitioner and agent in a planning model (see Figure 4). This adaption of the Rational Planning Model and practitioner by a Global South city will be discussed in the following sections.

Analysis and Problem Formulation

Chapter 3 briefly describes the first step of the Rational Planning Model as an in-depth analysis of a problem and its development. The city of São Paulo handles this analysis in a few different ways. First, the technical planning agency, HABI, conducts a survey of all the households in conjunction with the IBGE, the Brazilian Institute of Geography and Statistics. They survey the number of occupants, total area of the home, and condition of the dwelling. For the city of São Paulo, quantifiable information is just as important as the qualitative material gathered during this survey operation. HABI teams, public participation and the technical planning team, work together during this survey step to connect with community leaders in the informal settlements. They attempt to understand the issues in the neighborhood and community related to water and other kinds of infrastructure. Figure 13 depicts an image associated with this survey effort.

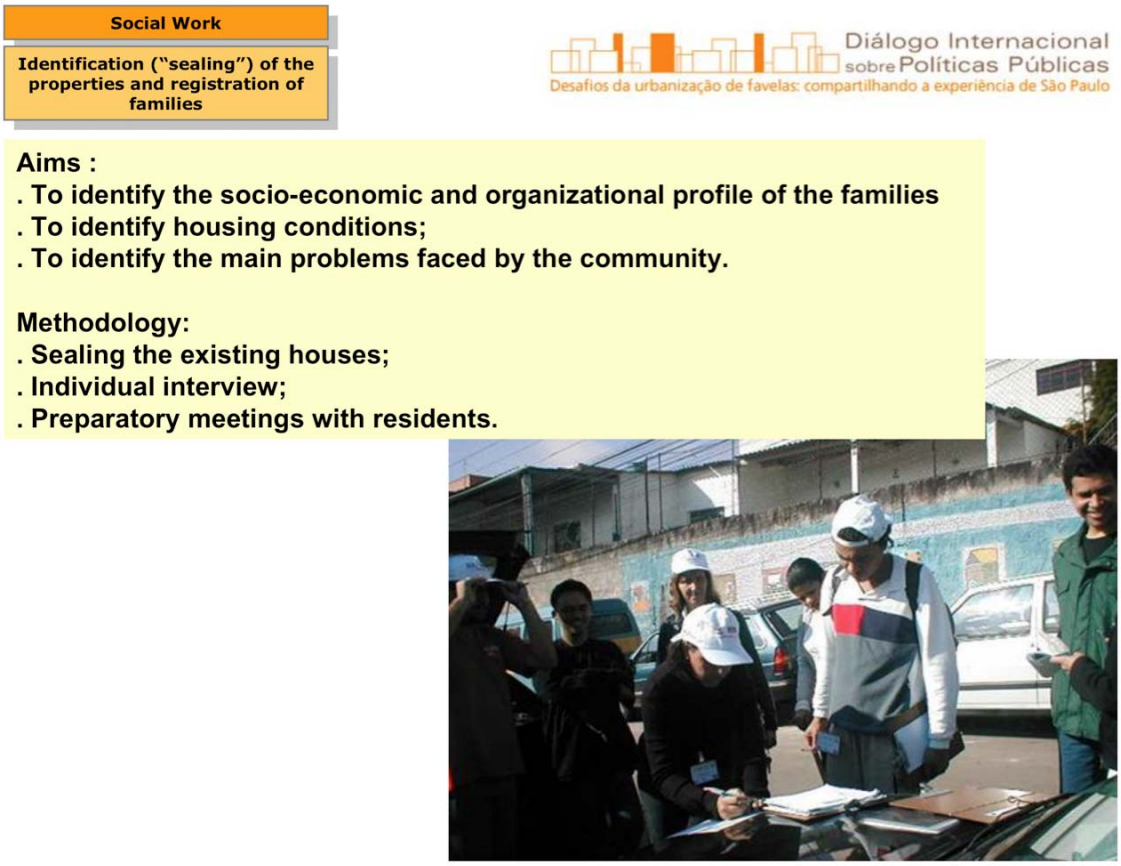

Figure 13: Survey activity in Paraísopolis.[23]

In Paraísopolis, the government agencies attempt to collect as much data as possible to update current conceptions and illuminate the process of historical development in the informal settlement. They do this data collection through survey , academic research and public participation outreach. For example, through their data collection HABI's technical team discovered that Paraísopolis was part of a subsidized farm in 1921 and later was occupied by informal structures during the rapid urbanization of the 1960s (Prefeitura de São Paulo; Cities Alliance 2008).

[23] Image provided by Prefeitura de São Paulo; Cities Alliance, "International Policy Dialogue: The Challenges of Slum Upgrading in São Paulo, Brazil," *Cities Alliance: Cities without Slums*, February 2008, 2008, http://www.citiesalliance.org/ca/ca_projects/detail/9509 (accessed December 12, 2009)..

Goals and Objectives

For São Paulo, determining goals and objectives for the regularization and provisioning of infrastructure is the next step in the Rational Planning Model. In this step, goals focus on creating general guidelines for specific objectives. These goals can be highly specific depending on the planning organization. The city must take into account that the Brazilian constitution sets a number of mandatory goals for the well-being of the urban environment and its citizens. One primary goal is the mandatory master plan for the city. This plan reinforces the second step – development of a trajectory for the Rational Planning Model - a starting point for the project. Moreover, the city must not forget the constitution's declaration that a home is an "inviolable asylum (Brazilian Constitution, art. 5, item 11)." Taking that into consideration, the city of São Paulo provides a flexible definition of "progressive living solutions" clarifying the necessity of informal settlements to low-income populations (see chapter 4).

In keeping with the notion that the home is a protected environment, the Constitution branches out to define the support systems necessary to the "basic principles" of citizenship (Brazilian Constitution 1988, Art. 6). Article 7 declares that to obtain the "basic principles" the government must establish a minimum wage that covers the cost of living, education and health services. A more direct declaration of goals, Article 182 obligates the creation of a master plan that supports the basic rights defined by articles 5, 6, and 7, and emphasizes social functionality and effective land management. In particular, land management entails progressive taxation for subdivision regulation and prevents vacant lots in highly dense urban areas. In addition, Article 182 emphasizes the "social function" and "well-being of its inhabitants" to improve the lives of all municipal residents. Amendments to article 182 continues to work on social

functionality by allowing the creation of legal and policy instruments to rectify problems of housing availability, degradation and precarious settlements.

Since independence from Portugal, land ownership in Brazil has become increasingly complex (Holston 2008). To mitigate the complexity, Article 183 addresses the right to adverse possession for informal or irregular settlements. Adverse possession is the process of land tenure through which an illegal occupation that has been unopposed for five years, occupies an area of 250 square meters and is the sole home of the occupier becomes property of the occupier. The desire to decrease complexity guides cities to support residents' right to land tenure.

In addition to the federal government, São Paulo has also established goals for the municipalities; specifically noting issues related to their particular region. Working from the City Statute of 2001, cities may now create legal and policy instruments to ease the construction of property lots, taxation and development of special interest zones. Further, the statute allows irregular and informal settlements to occupy public properties by creating the "grant right to use" for permanent occupation.

As São Paulo developed its Master Plan, *Plano Plurianual*, it specified its own goals related to informal settlements. These include the implementation of a monitoring and evaluation system for housing policy, supporting of progressive living solutions, taking action on approval and regularization of housing projects, improving the quality of public works and addressing issues of informal settlements and dilapidated housing stock.

Within the public participation framework, the purpose statement and goals engage in the issue of information in the Rational Planning Model. Access to information for stakeholders and social inclusion are primary goals of the framework. The first goal focuses on the availability of information and its access to all stakeholders in the process. Access to information, a fundamental issue of the Rational Planning Model, attempts to

provide the planning technician as well as resident with as much knowledge as possible. The second goal, that of public inclusion in the planning process, correlates with the roles of the practitioner and the stakeholders. Both parties need to work together to successfully implement any community improvement strategies. The social inclusion goal focuses on the equity issues plaguing the Rational Planning Model (Davidoff 2000). These goals guide action for an inclusive planning process. The public participation teams use of charettes, "work fronts," enables it to achieve the goals of information access and social inclusion. According to Forester and Schön in Figure 4, the social inclusion goal provides key elements to the following forms of action: democratization of the Rational Planning Model process and provision of important information for frame analysis.

Alternatives

Within informal settlements, there are two distinct ways to develop the alternative step of the Rational Planning Model. First the technical planning team may open a bidding process to design and construct the urbanization process for the informal settlement. The selected firm then provides the technical knowledge needed for the safe construction of the improved housing area (refer to figure 14 for a photograph depicting this process).

Figure 14: Charettes at Paraísopolis.[24]

Alternatively, by drawing on technical knowledge, public participation team work concurrently with the community to hold charettes or "work fronts" (refer to Figure 14). The charettes allow the technical team to discuss design alternatives with the community. They discuss the dangers of certain household locations, flood risk areas, needed improvements and community concerns. The charette activities include a mapping exercise where residents draw out with technicians the changes that they would like to see in their community.

[24] Image provided by Prefeitura de São Paulo; Cities Alliance, "International Policy Dialogue: The Challenges of Slum Upgrading in São Paulo, Brazil," *Cities Alliance: Cities without Slums*, February 2008, 2008, http://www.citiesalliance.org/ca/ca_projects/detail/9509 (accessed December 12, 2009)..

Figure 15: Choice process for Paraísopolis.[25]

Comparative Assessment

The comparative assessment step requires stakeholders to determine the requirements needed to resolve their problem. Stakeholders develop numerous iterations of solutions based on findings made by the design firm and the community during the charettes. The design firm proposes an idea to the community, taken from its suggestions, and revises its previous plans to address new concerns. The process for the comparative assessment creates a feedback loop where stakeholders may voice their opinions and suggestions.

[25] Image provided by Prefeitura de São Paulo; Cities Alliance, "International Policy Dialogue: The Challenges of Slum Upgrading in São Paulo, Brazil," *Cities Alliance: Cities without Slums*, February 2008, 2008, http://www.citiesalliance.org/ca/ca_projects/detail/9509 (accessed December 12, 2009).

Choice

After the comparative assessment is complete, stakeholders are now in position to make a choice. In the choice step, community stakeholders review housing alternatives (see Figure 14 and 15). Both the technical planning and public participation teams are present to provide additional information needed to address resident concerns.

Figure 16: Monitoring of Urbanization process for Paraísopolis community.[26]

[26] Image provided by Prefeitura de São Paulo; Cities Alliance, "International Policy Dialogue: The Challenges of Slum Upgrading in São Paulo, Brazil," *Cities Alliance: Cities without Slums*, February 2008, 2008, http://www.citiesalliance.org/ca/ca_projects/detail/9509 (accessed December 12, 2009).

Implementation

Figure 16 illustrates how the public participation framework structures the implementation of the urbanization plan. After all stakeholder groups have agreed on a project proposal for the urbanization of the informal settlement, the public participation team and the technical planning groups continue to work with the residents to ease the transition into construction mode and to ensure their needs are met. Due to the urbanization process, informal settlement residents relocate during construction but are provided alternative accommodations. They are later resettled in their community after the completion of the improvements.

Housing Programs 2005-2008			
Program	Units Produced (2008)	Units in Production	Benefited Families
Favela Urbanization	2,330	6,351	73,749
Regularization of Public Land	-	-	23,022
Regularization of Irregular Settlements	-	-	28,150
Tenement Improvements	-	-	7,000
Reservoir Guarapiranga	729	-	38,000
Watershed Areas	7,726	-	60,024
ZEIS	265	85	350
COHAB projects	2,111	1,393	3,504

Table 8: Housing Improvements from 2005 to 2008.[27]

Table 8 represents the implementation success as indicated by the number of families benefitting from the urbanization process. In 2008, favela urbanization process

[27] Adapted from Prefeitura do Município de São Paulo 2008.

led to construction of 2,330 units. Further, 6,351 are currently in production. At present, over 73,000 have benefitted from the urbanization process.

Evaluation

The city master plan (*Plano Plurianual*) aims to monitor and evaluate housing policies. After urbanization projects are completed, HABI and IBGE continue to monitor urbanized informal settlements for any issues that may arise. They work from the prioritization indicators to observe and address improvements or negative reactions from the recent changes. Indicators such as health, wage, education levels and crime are taken into account when conducting follow-up interviews with residents.

THE MUNICIPAL PERSPECTIVE IN SÃO PAULO

According to Figure 4, the practitioner has different means to counteract the possibly negative political influence the Rational Planning Model. These forms of action include: democratization, frame analysis, repertoire, researchers and practitioners, and organization. Figure 17 describes a unique and distinct municipal perspective of the planning process in São Paulo. It indicates that the practitioner works within a system of structural inequalities; residents of informal settlements have less access to transportation, education, and water infrastructure (Forester 1984).

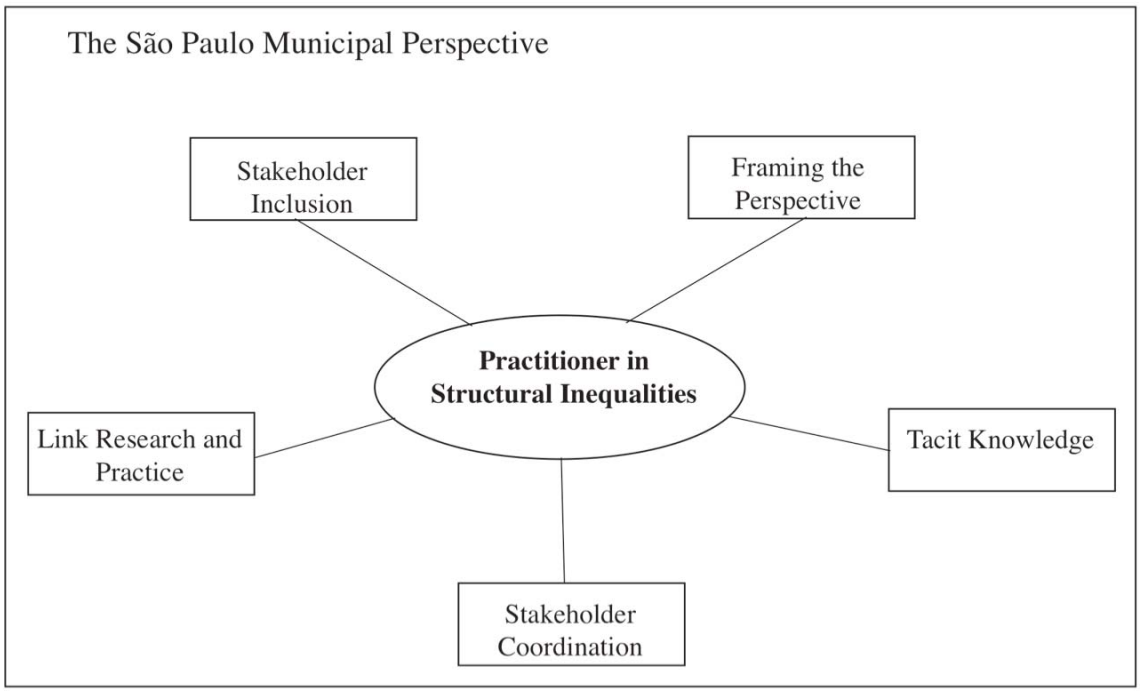

Figure 17: The Practitioner's Activities and Characteristics of the São Paulo planning process.

The goal of democratization is observable in each step of the São Paulo planning process. Evident in Figure 12, agents from technical planning and public participation teams continually aim to inform the community of a proposed urbanization process. Throughout the process, the stakeholders are encouraged to participate in the decision-making process. The process of inclusion implies that the decision-making has democratic qualities. Having public participation, then, can help to empower the community to make decisions about the urbanization improvements.

Second, framing the problem situation is a crucial step for the frameworks involved in the Rational Planning Method of the Global South. To ensure proper framing, the technical planning team conducts a quantitative survey of the community while the public participatory team does a household survey to meet community residents. Each

team provides a different set of information to the designers and planners of the urbanization process. The collected data permits the practitioners to be flexible in case of unanticipated issues, and to re-frame the problem situation as needed.

Third, the information collection step of the Rational Planning Model allows for interaction with researchers and practitioners. SEADE uses the social vulnerability index for the particular issues of the city of São Paulo. IBGE, the demographics bureau, provides another element of information supporting a comprehensive look at Brazil's informal settlement populations.

Organization is another key element for the practitioner in the Global South. Historically, land tenure laws were very complicated and created many problems for formal and informal residents (Macedo 2008, Holston 2008). Now organization is a key objective for the city and for the planning process in São Paulo, as evidenced by the improvement of the land tenure process by the Constitution.

Repertoire (noted as Tacit Knowledge in Figure 17), the last key of urbanization in the Global South, is enhanced with each urbanization process the practitioner implements. According to Walter Azevedo, there are currently 169 informal settlements in the city of São Paulo. There is an opportunity to learn from each settlement and each initiated urbanization process. The tacit knowledge gained from these experiences give the practitioners in São Paulo a unique viewpoint of the provisioning of water infrastructure to informal settlements.

The incorporation of the actions of the practitioner in an environment of structural inequalities, however, is not without its challenges and difficulties. Paraísopolis, the largest informal settlement struggled with the following issues: residents did not trust the public agencies; "work fronts" attendance was inconsistent; community viewpoints were so varied it was challenging to come to agreements on urbanization alternatives; and

agency coordination at the municipal level was disorganized (Prefeitura de São Paulo; Cities Alliance 2008).

In the case of Helíopolis, surveying from step one of the Rational Planning Model took longer than anticipated and ended during the beginning of the construction phase. Public participation was different due to the conflicting views of various organizations in the community thereby creating an unanticipated process of decision-making. Along with choice decisions, project alternatives and changes in management prolonged or emphasized the political influence. The coordination of municipal agencies and political influences were other challenges that the technical and public participation team encountered (Prefeitura de São Paulo; Cities Alliance 2008).

CONCLUSION

The city of São Paulo has created a planning framework that incorporates many elements of the Rational Planning Model. Each step of the Rational Planning Model, adapted from Hilda Blanco (1984), is accounted for by either the Technical Planning or the Public Participation teams. The methods employed by each team include "work fronts," quantitative and qualitative surveying, monitoring and evaluation activities. To complement the RPM, the city of São Paulo planning process can be defined by the activities of a practitioner from the works by Forester (1984) and Schön (1983). These activities support the democratization of the planning process, the inclusion of the community narrative for frame analysis; the necessary organization and coordination amongst stakeholder groups; use of the necessary research and reports from practitioners; and the ability to gain tacit knowledge from the urbanization process.

The following chapter will draw on the conclusions from chapters 3, 4 and 5, and provide recommendations for further research on the municipal perspective in the Global South.

Chapter 6: Conclusions and Recommendations

This thesis examined numerous documents related to the planning process in São Paulo. To comprehend the process, the Rational Planning Model provided a foundation for evaluation of the methods of municipal agencies. Examinations of the constitution, policy articles, planning documents and public participation information led to two conclusions. First the informal settlement is characteristic of the Global South and the city of São Paulo. Its dynamic and complex characteristics vary from region to region as evidenced by Caldeira (2000), Holston (2008) and Perlman (1976). Observation of informal settlements led the federal government at all levels to create specific objectives addressing development issues stemming from rapid urbanization and the informal settlement. Notably, the constitution of 1988 was instrumental to the creation of the City Statute of 2001 and municipal tools for tenure regularization and land use management.

A form of the Rational Planning Model in the planning process in São Paulo and the unique development of the Brazilian municipal perspective is created is clearly illustrated in chapter 5 . Democratizing the process, allowing for a frame analysis, working with researchers and practitioners, agency and community organization, and the ability to collect a repertoire of information are distinct elements of the planning model in São Paulo. To provide the linkage between scientific knowledge and societal guidance, the technical planning team and the public participation activities work together to tackle the issues of land ownership complexities and the varying needs of stakeholders.

Within the Rational Planning Model, the technical planning team uses quantifiable information such as landslide risks, density and infrastructure indicators. Additionally, the technical planning team tackles the bounded rationality of knowledge by attempting to do a thorough analysis of the site in question. These aspects along with

resident surveys by the public participation framework team aim to be inclusive of low-income individuals. They emphasize inclusion because the participation of residents can negate the political influence addressed by Flyvbjerg (2003) and Davidoff (2000).

Likewise implementation and evaluation tools are encouraged and established by the municipal master plan, *Plano Plurianual,* securing the necessary political support for implementation of strategies.

The municipal perspective, through the interview data, provided a few perspectives. First, SABESP agents describe the problems in the provisioning of water infrastructure in technical terms. The agent from COBRAPE also added another technical element to the discussion but noted that many social factors contribute to the success of urbanization projects. Samuel Almeida discussed issues of crime, violence, and stability in the communities of informal settlements. But a greater exploration of the municipal perspective is needed to make a conclusive judgment of the influences on the decision-making process in São Paulo. I recommend interviews with the city, state and federal housing agencies, and data analysis institutions like IBGE and SEADE, these interviews can add a key perspective to the municipal agents viewpoint. During these interviews, the following questions should be asked:

1. What are the goals of federal, state and municipal agencies for the provisioning of water infrastructure to informal settlements?
2. Do these goals differ across different scales of government? If so, does agency organization and coordination adjust for these conflicting interests?

These questions explore how the municipal perspective differs along agency scales and possible changes to the planning process created for the city of São Paulo.

RECOMMENDATIONS FROM PRACTITIONERS

Prior to the 1988 Constitution, social organizations in informal settlements worked within the political framework to obtain services for their communities. Social organizations can be defined as worker's unions, religious associations and neighborhood associations (Perlman 1976, Holston 2008). Mobilization of social organizations brings about equality in a democratic society (Flyvbjerg 2003). Despite the obligation to provide water to the residents of São Paulo, two distinct resident fueled approaches to water appropriation are noted by municipal planners. First, communities tap into water mains illegally. Second, reaffirming the social mobilization in the works of Holston and Perlman, groups and resident associations approach municipal officials for water provisioning during an election year in exchange for political support.

In relation to the challenges of informal settlements, the municipal agents of SABESP and COBRAPE were asked what they would change about the infrastructure planning for informal settlements. Interestingly, the municipal planners expressed a range of perspectives. Samuel Almeida argued for designated areas for favela construction. He said:

> São Paulo doesn't have a master plan telling where there will be new urbanized areas for favelas. We need to assume that the favela is a typical Brazilian thing, its not just Brazilian but the rest of the world, people come from the north east of Brazil thinking that they will do a favela. They come here to build their houses in the favela. So we need to have it as our own and treat it as our own. And bring the solution, if you are brand new, and you want to do a favela, do it there. You will have the water, sewage, drainage, electric power everything regulated. It will be much easier then resettlement (Almeida 2010).

Mr. Almeida assumes that there is land available for the influence of residents and assumes that property tenure instruments have been created for the informal residents. One thing to point out from this comment is the social integration or social inclusion into the municipality. He does add that the distances of the new residents will be quite far

from the city center, which leads to another question of equitable access and economic diversity integration.

Daniel Henrique emphasizes the need for more alternatives, but, he calls the state planners and technicians working for the state weak. Weak organization and coordination, he says will repeat the same historical errors of not addressing the phenomena of informal settlements.

> [T]he planning stage of a favela in an urbanization process must have a kind of open alternatives to reach the resettlement, to reach this new urbanization process. As usually this state is a weak state, you cannot take that into consideration into the urbanization process (Henrique 2010).

He also is not confident about the government's ability to be effective in a problem situation that calls for multiple alternatives and strategies.

A community agent, Walter Azevedo, offers a different perspective. He insists that the regulation of water provisioning is best to handle illegal land occupations. He adds that the city should step forward to identify where the water connections need to be rather than obligating SABESP to provide water connections. He says:

> I would change the regularization process of water supply to illegally occupied areas. To settle the links needed for water, a vital life resource, the city agencies in charge of authorizing connections need to have an improved process of authorization and a process of prosecution for illegal connections (Azevedo 2010).

Mr. Azevedo stresses that illegal occupations are the ultimate problem and does not address the housing shortages in the city of São Paulo.

Each practitioner describes his own personal solution to improving the planning process, organizational management issues and policy changes on provisioning services. Unfortunately, housing officials at HABI were not available for interviews. Their perspectives may have brought a different framing perspective for the delivery and maintenance of water to informal settlements.

The informal settlements also have their own methods of appropriating water services. They can tap illegally into water mains or they can mobilize to demand infrastructure. According to the interviews with agents of SABESP and COBRAPE, practitioners have varying viewpoints of possible changes in planning for informal settlements. One practitioner thinks it is best to set aside areas for informal settlement residents thereby possibly segregating them from the city landscape. The central area director of SABESP suggests that the municipal agents create numerous alternatives for informal settlement residents by easing pressure from other agencies to construct public infrastructure. And lastly, the community agent of SABESP idealizes a higher control and regulation of illegal connections. He desires a city administration in touch with its community members.

CONCLUSIONS

The city of São Paulo and the Brazilian government are working simultaneously to provide basic principles of social welfare to their residents. SABESP adds another 100,000 residential water connections each year trying to cover the growth in population in São Paulo (Henrique 2010). And the legal and policy instruments of the federal and municipal governments have provided opportunities for municipalities, and thus urban planners, to bring technical and community-based knowledge to address specific problems in their respective municipalities.

In this case study, I have researched the formulations of the Rational Planning Model in North American studies where the inclusion of advocacy and pluralism are necessary to address contemporary problems in the urban environment. Exploration of the planning process of São Paulo demonstrates similarities to the Rational Planning Model through the legal, municipal bureaucracy, technical planning and public

participation frameworks. To complement the planning process, the informal settlements have also developed their own methods of water services appropriation.

Through the legal environment, the city of São Paulo has created a process similar to the Rational Planning Model and has expanded the definition of the model to include the aim of public participation. In public participation, the practitioner takes on a different role, to aim for stakeholder inclusion, build a foundation of tacit knowledge and experience, frame the ever-changing perspective, work to coordinate and organize stakeholders and agencies, and work alongside academics and other practitioners for problem situations in the urban environment. The municipal urban planners of São Paulo continue to re-frame their perspective of the municipality. Methods of scientific analysis, evident from the planning process in São Paulo, are able to address social problems only when accompanied with a public participatory element working for social inclusivity in all stages of the Rational Planning Model.

These activities and characteristics of the practitioner answer many questions about the planning process but fail to elicit the narrative of the practitioner? This research lacks an in-depth look at the practitioners at the informal settlements in all levels of government. In particular, it fails to answer the following: Do goals between these scales of practitioners differ? And how do these goals differ in implementation in the provisioning of water infrastructure to informal settlements? When these differences are in conflict, do the practitioners change their processes to accommodate the unexpected differences? These questions still need to be explored for a comprehensive exploration of the Rational planning Model and the municipal perspective in the city of São Paulo.

Appendices

APPENDIX A: INTERVIEWS CONDUCTED IN 2008

Paulo da Silva

Environmental Policy professor at the University of São Paulo - interview conducted on May 29, 2008:

> Master plan, yes. Re-doing it currently. Implementation. Responsibility of the planning office. See Instituto Polis. Need to precise in Urbanistic issues.
>
> Sociologists: participation, public policy. Environmental issues = car rodizio, solid waste, water management, water basin committee. Issues of governance in water management.
>
> Alto Tiete River Basin Committee
>
> 16 state representatives: water, energy, planning, health, housing. 16 Municipal representatives. 16 Civil representatives
>
> Council of engineers, communities, NGOs, science and research institutions, entrepreneurial, agriculture. 1 water basin committee for each sub-basin.
>
> Works ineffectively with distortions/vices.
>
> Yet to be discussed: conflicts: Rodoanel (hwy around city). Changes in route, water agency board. Oriented management of resources obtained by water charges (FEHIDRO) by state of Sao Paulo. Hope to use for the improvement of the basin - Water basin agency, Water basin committee
>
> Chamber: responsible for planning, implementation of water charges. Water basin plan in revision. Distribution of resources received by royalties of energy. This has been used to implement environmental education.

Civil society has a lack of monitoring system. Quality/evaluation of implementation of educational programs.

Projeto Guarapiranga: world bank funded.

5 Elementos: another group with Jacobi.

Law: political culture. Clientelism. Rigid: allowed everything to be excluded. Thus the land became unusable, unfeasible.

1997 state legislation – lei specifica: look at how the future of this law will be implemented according to each of characteristic of the sub-basins. 1st approved plan Guarapiranga 2006. No real empowerment. "loteamento clandestine." Sells illegal land to unknowing citizens may not have the infrastructure to provide for the unknowing residents.

The fact not to enable the force of the law against irregular land transactions or all types of irregular behaviors which is only enforced against the poor only.

Sophisticated environmental law against crimes.

Lack of enforcement: metropolitan SP. Larry Graham with Henry Dietz.

Complexity of enforcement: logic of political corruption

SP: big brother has to be included in all negotiations very little has been implemented to put the municipalities in consortium. Article at FGV by Jacobi.

Consortiums do not take place. Political disputes. Lack of logic or compensation and understanding. In metro terms must create compacts to improve economics of scale.

Water basin management: brings about only issues of water relations adding of laws in the future that each of the regions will be covered or guaranteed a capacity at a municipality level and structural partnership and implementation of a land-use practice – better articulated.

Social responsibilities: more and more motivated in social learning can't be paternalistic. Most practices are based on paternalism.

Ex: 1 million are living irregularly, then someone gave them a chance. Means to day that you can't simply ignore but there must be a solution. Very painful/painful/not painful.

Could be eviction. No mass evictions have occurred. In some cases, floods can promote evictions.

At a municipal level, politicians/managers deal with problems paternalistically or populist so they hold their political positions. May accept any situation.

Water basin: agenda of the state government.

Give basic sanitation. At times there is a condition but people will not connect due to possible costs. Maybe subsidize these connections but people do not understand these ideas of degradation/impact of water.

Ana Lacerda

Civil Engineering professor at the University of São Paulo – interview conducted on June 2, 2008:

Master Plan watershed committee: sub commission

Planning: 9 members to form a specific task force. Working group with plan. Discuss ideas among 9 members.

Issues: Water supply, Water quality, Urban drainage and Land use

Action plan (now being discussed) updating all the data and diagnostic the basins.

Plano da Bacia Hidrografico do Alto Tiete.

Action Plan - 4 technical parts plus institutional setting

Positives -Not expecting population growth as historically recorded in the 1980s

Negatives - Future water supply sources, lack of sufficient local water sources

Where to go? Potential options

Political/environmental problems - SABESP

Another set of alternatives: Demand management, contingency plans, sustainability of ground water use. Expansion of system, water is a public good

Permit to drill for water, criteria for drilling

65m3/s surface – Public System SABESP

45m3/s groundwater

Permits must stick to their own wells.

Cannot change to surface water because SABESP doesn't use groundwater

If there is misuse in groundwater, levels can go down or lead to contamination.

Wells might turn to public system. Must keep these users to groundwater could lead to groundwater contamination

Wells: 8-9000 operating, 1/3 known and recorded, 2/3 unknown and illegally operating

Action plan: How to develop policies that will provide incentives to register those unknown wells?

Water Quality: SABESP, Projeto Tiete: Sanitation, sewer collectors

Construct sewers and wastewater treatment systems

Improve efficiency of these collections

Replace old networks - Clean streams project

10-15 Years to complete project - Worried about clean rivers

Objective: interconnections with sewers/wastewater

Disconnect the sewage and water system

Work in a smaller scale to solve the water quality

Gray area - Nonpoint sources - Rain runoff in drainage system

There are areas where they can improve impermeability

Set incentives to municipalities in controlling nonpoint sources

Filtration - Restoration of wetlands - Parks/green areas

Control spreading of urbanized areas

Use water charges (FEHIDRO) to repay municipalities to support controlling of urban areas

SABESP - Provide services w/o any doubt - Impact is worse if no infrastructure

Water Resources Law

Enforcement not included

Suggestion/political negotiation

Municipalities will see its for their good to provide housing w/in their city center.

Not in control of macro drainage system.

Watershed Committee

Progress: 1st plan approved in 2003

Main problem: LAND USE

Outside of water resource sector

Land Use - Municipality problem

Level of awareness has increased with state/government action

Decisions exclusive to municipalities.

State/government has no legal basis to interfere.

Sao Paulo state - Created a resolution that each new development has EIR/Assessment that in a way the state will be involved in land use in the municipality.

Any urban development above a certain size must have a license for development from the environmental agency (ISMA)

Inefficient education programs

Too much money spent - Unfocused/ineffective

No quality control or evaluation process

Lack of organization within the committee for distribution of funds

Now there is competition for money so a much more selective process for education funding

Evaluation/Assessment - Traditionally water quality monitoring

Expanding capacity, urban sprawl, first plan needed indicators

APPENDIX B: INTERVIEWS CONDUCTED IN 2010

Samuel Almeida

Private contractor at the firm COBRAPE – interview conducted on January 27, 2010

Julienne Bautista: Do you have any suggestions?

Samuel Almeida: I think you need to tell me what you need, and what you….anxieties about the project the best information I can get I will give you

JB: so I looked at your website some are in the city. (first question.)

SA: I am a project coordinator - much more as a project technician.

COBRAPE works on most of the new planned developments of the city. Here I have in my hand is the master plan of RMSP (Metropolitan Region Area of São Paulo). That's our kind of job one of the most important lines that we have. Also COBRAPE does the proper project for the re-urbanization all the buildings, all the water, sewage, everything of this project we have some specialists on it. One different point of view is the coordinate the resettlement of the people who need to move from the favela to the new buildings they get. I think that is about re-urbanization. We just don't take decisions. We make the plan. Who hires us? There are two main companies: CDHU the federal urbanization bureau and SEHAB is the habitation secretary of the government, secretariat. What they do is search for the area that needs more help and hire COBRAPE. Actually there is a process, *editão* (sp). And then we do our proposals, financial and technical. They are the best quality for the best price. This is the process of hiring people and how the government hires people to do the project. This is the way. For us, we send our proposals and we get someone who has a lot of knowledge on this project to do it. One of these guys I don't know if he is still here but I will get you in touch.

He's actually a German guy who worked for COBRAPE for ten years. He draws projects and now coordinates also the development of the projects in SEHAB and CDHU. We follow them while we manage the process of construction also. And here to the side we have the guys who do the social area. They do the approach and the resettlement.

JB: So do they talk to everyone?

SA: Yes, they have to. They catalog everyone. They catalog the houses. Once there are the new buildings are done, they help to distribute each one for each place. They help inside your home: what's your budget, what's the best way for domestic handling. It's everything. It's social work inside the process of bringing a new home to the person. Because we have a lot of problems in cases of: the person doesn't like the neighborhood, you know. I live in my neighborhood. I love my neighborhood. I don't want to move. If I move, I need to be together with my fellows, my friends. So it's hard to separate people and you have a lot of rejection. For most of the people, we re-settle two years after they left. This is very important. If you don't have this approach, you lose the effort. These guys will sell their place and it just became money. A loan since you gave the money to these guys. And they actually are not appropriate for the place. Actually they go again to the margin of the city and build a new poor brick house.

JB: How long have you had the social work department?

SA: It's not new. It's actually has ten years. But now if you want to talk to someone, because we have some difficulties since the coordinator has left. We can find someone to talk.

JB: It's not that important.

SA: But if you want to know the jobs we work, we have a new office in the jardim (Gardens area of São Paulo) near the rehabilitation areas.

JB: Do you monitor any of the water in that neighborhood with SEHAB or CDHU?

SA: After we resettle the people into their place, they need to start paying their bills. So this is should be. First, before you didn't pay anything, not water, nor electric power, nor television and whatever, sewage. Since you living there, you need to pay a lot of things. Energy, water, sewage, TV and what else, the loan for the place. It's very cheap. 50R per year. The water is the minimum, 10R or 20R. Electric power is also the minimum, 10R. but then you get them 100-120 ft for a family that lives with 500-800 R from nothing it becomes a substantial amount for the family. This is another job of the social work to make them understand that these fees are very important. Not just for them and for the whole community.

Um so if you ask we monitor the water. This is the perspective. I can show you here. In this map, what you see here is SP, this big area. So these are the sewage…we have a lot of money. *Manancial* – a watershed. We have a lot of watersheds with reservoirs that we transpose the water to one big captation that treats water and pumps it to the city. Also in Guapiranga, this is alto-tiete an d here we have the main one that is cantareira. Cantareira watershed is very big and goes all the way to Minas Gerais. Guarapiranga and Billings are together so we have one station here and here, a few stations here. One of the biggest SP is to find where the new water for the thirsty that is coming up. And secure the water, a lot a lot but in the history 5 situations in the last 50 years of more than 2 yrs of dry season. If we have one of these in the next two years, we are in a bad situation.

SA: We are under the risk for lack of water.

JB: How do you distribute water to informal settlements?

SA: About the distribution, our distribution I can say is very efficient. Not efficient in the matter of leakage but that everybody has water in front of their houses. SABESP did the in the 80s and90s did an important job to cross the whole city with water pipes. If you have a small house in the area nearby, SP did a station there did a small well there for you. They have captation for isolated areas. Just for small consumption. Who doesn't have water from SABESP has it from their land. If you have a small farm around SP, you have water from your well or the river on your land. So what I can secure you that is about we have water for everybody and not everybody pays for it. Or they steal the water. Do you know what balance-hydric means? Hydric-balance. (draws diagram) you have a lot of water you collect. Then the water you treat. And then the water you earn from that. This is one type of loss. If you treat, it leaks. Or someone steals. So this is the balance. You collect, you treat, and you balance. You lose water in 2 ways. One is leakage, and the other is stealing. One is social consumption - a well or fountain for the favela. Another way of stealing is put your pipe inside our pipe. Or get the clock that measures your water and break it. The meter, you switch the meter and you get a lower measurement. These are 3 ways of stealing the water – real losses or apparent losses. Why that? Real is where you saw it because the pipe is broken. So they are real losses. Apparent losses, when you finish the balance, there is something wrong because you don't know where the water is because it is stolen or measured wrong. Then this water is apparent loss. It's a doubt loss. It's not doubt because SABESP has a group that just work to find who steals and who changes the clock. So they find a lot. What else? So this is how we measure the water.

SA: We deliver the water in the pipes and you need to do the connection to our pipe. When it's a very poor area, sometimes SABESP/CDHU or other places will come up with money to pay for the connection for you. If you are not in a poor area, then it won't. You are responsible for the connection. You are obligated to connect. If there is water in the front, you are obligated to connect - unless you a large development of houses, selected not to buy your water from SABESP and you are going to do your own. You just get your environmental license to prove if you prove you can do that. This is about license. You get your license for your habitation if you have water. Otherwise you are obligated to get it from SABESP. Who's SABESP? SABESP is a private a company it was public and now its private. It was part private/public until now. And they own license to operate and maintain the water disposal, sewage collection and treatment for SP. Actually they sell it for a lot of cities - some 200 cities in the state. Something like a third of the state. Probably the biggest cities are with them. Sometimes we get a city, like Campinas. And Campinas decided not to sell their water company to SABESP. Campinas has their own proper water company. And they deal with it really well. But around SP, you will see municipalities have their own water provider or they buy if from SABESP and distribute to the residents in their municipality. Most of them do not have sewage treatment, and they also collect and give it to SABESP's pipes and treats it and charging it. So that's SABESP who buys and sells water service and treatment of sewage.

SA: SABESP works like this – just talking about water. They have small areas, not really small, that they know where the water comes from. Cantareira gets all this neighborhoods in this area. In your neighborhood there is a big meter at the water tanks, the reservoirs. Small reservoirs inside the city at these reservoirs they

measure with, what we call, micro-measuring. There is an amount of water that comes to the neighborhood. One at the collection when you gets the water from the river. One is right after the treatment station. The other is in the neighborhoods in the water tanks. So you see 75 so you have a leak. Micro-measuring every house has this measure and every month they go check the meters. And then you see that some meters that 60 m3 are consumed. 39 % of loss. So this is the loss of amount in SP. It's a high loss principally that water is a problem. Its n we have a lack of water for the city and the whole area around of SP because we are in areas of river springs. And you just have springs you don't have the amount of water enough water for you or you are going to dry the springs. And that is not a good thing. Difference then when a city has a large river crossing it and you can drop all your shit in your rivers. But in Tiete river has been polluted since 1930 because when the city reached one million person. the sewage of one million persons is more than the river can treat itself. Now its 20 million people we need a 95% treatment of our plants just to get back to the dirty river we had in the 1930s. It's like 100 years of the river dirty. There's no virtual way to get it cleaned. It's more like impossible to get it cleaned.

SA: In a formal area, you get a meter there and you pay your bill. In the favelas, you don't have the meter. One the municipality pays a fee or you live in a poor neighborhood and you have a clock and you pay the low tax of being in a poor area. Third possibility that happens in a large scale – you do your hole in the pipe and you get it and nobody knows it. SABESP is only obligated to give you the water and can't cut you off. But it would be better if they monitor it. They don't know how much they consume. They just know that they consume. This is an apparent loss.

SA: About quality, I think our water is really well treated. As our pipes have a long way, we have a lot of chloride and we have some laws that restrict what is a good water. SABESP deliver it to the station at the highest quantity of chloride it can have. But it gets to your house, they do collection at every month, when you get your bill at the bottom of bill you have the water quality for each month. This is the maximum and how was the water for this month. When you check the chlorides, it would be a high level its almost half the way but when it gets to your house or your door. It's a tenth of what it was. If we didn't do it that way we could have risk of, don't know of, some contaminants or something. Other thing we have is fluoride, which is good for tooth and everything. I think that the treatment is good. Sometimes we have problems with taste in the water. If you go to the tap water, it will taste a little acid. It is probably because of the chloride. Other times we have problems, specific in these reservoirs, here G and B, because of algae bloom. Once in a while, now it's a long time since they are treating it hard to keep it down. You get algae bloom and the treatment needs to stop. Its been a long time it doesn't happens. You get some taste and they add copper to kill the taste. There is some risk of getting something poisonous because of the algae bloom. They keep an eye on it very hard. That's working with water that you know. The general public does not know it.

JB: What kinds of information do you use in deciding how much water to allocate to informal settlements? And what kinds of information do you use in deciding when to do maintenance on the water delivery system to informal settlements?

SA: I don't know specifically when you do the maintenance. One thing is, the water in SP and other countries too, you pressurize the water and the water pipe. So you can get, if you are in a house and you have 2 or 3 floors, the water goes to

the 3rd floor straight. In Brazil, like every other country in the world, it's forbidden to have water tanks in your own house. Actually I don't know if its forbidden but it is in France. But we do it anyway because it is cultural. In the past, we would have times we would have water twice in a week. And if you don't have your water tank, you don't have your water.

SA: SP has a proper system and it works really well. Most of the cities in the SE. but if you go to the NE or if you go to any other place in the country, you will find situtations where that the water is not for everyday. Some day for one neighborhood and not for the other. We need water tanks and we need our own reservoirs. So these guys steal the water and it goes to the water tank and they have water enough. I have never heard of lack of water in poor neighborhoods. Its much more easier to find broken pipes in the poor neighborhoods because of bad dealing then because of high demand. Principally because they don't have very high demand. In a poor neighborhood you have a demand of 160-180 liters per day per person, in a rich area you can get 300L/Day/Person. You wet your garden, you water your garden, you wash your car, and all of these consume much more water. You have more taps, sinks and toilets per person. So in a rich neighborhood you need much more water than in a poor neighborhood.

So how to decide. There is no decision - this is an obligation. You need to give the water. Even if it's a not formal area and you like, if you, I don't know how much of the law poor people know, but if I live in a area of the city and I complain to the municipality that I don't have water. Its really quick they bring water for you.

JB: and the city will pay SABESP for the services?

SA: No, you need to pay for it but they need to offer it. As I said, I don't know. Probably when you measure that the pressure is going low, then its time. We have a straight line to the SABESP company that you can tell if you found a broken pipe or something like this. It takes, average 7 days, to fix the broken pipe. Its not really quick but it could be worse.

SA: Well, captation treatment none. We captated it from a very far away place and you treat it from a far away place. It's the same water fro the whole city. For the distribution, you have problems because most of these houses are built over the pipes. You have a lot of this problem with sewage more than water because or…have you ever been in a favela?

SA: In a proper favela, not urbanized, you have this net of trails between the houses. You have 1 or 2 meters and it goes into the middle of the block. And these people are living above the water and they need to go through this place. Or SABESP encounters these tiny roads and dig their pipes in this place to get water to the front of their house. In one favela, the water is in the street and you can see the pipes inside the street. Even with electric power, the light towers in front of the street they have a net of cables going to the favela. The same happens to the water with the pipes connected to the walls of the houses - usually very small pipes. This is one of the biggest challenges to bring water for them. Because they don't have street organization and its quite hard to bring the pipes inside. And of course the favelas they decided not to be inside the city in a not urbanized area where they have all the public services and a new favela in a very far area brings a problem to get the main pipe for it. The main pipe is a regular job. The hard job is regularize or urbanize the area. It depends on the type of favela, if it's a nice favela. Its not my job its theirs.

JB: Are there any challenges to allocating and delivering potable water to these residents that are related to other issues in the city?

SA: Captation….in other areas of the city, I don't think we have these kind of problems. Of course, if one of the main pipes break or but its….every year you hear they will do one day of maintenance and they stop the water for one hour and do the maintenance. In my neighborhood, I don't feel any lack of water. I don't hear from my friends that water is a problem. If you ask if the water is the problem, they will say that the bill is expensive. As the system is very complicated it gets very expensive. From now on, as we get water from farther, it will get expensive. In other cities, the water is very cheap.

Even in the highland of the city, the north area, the pipes here are more pressurized so the water gets higher.

JB: How does your agency work with water users of informal settlements?

SA: COBRAPE, we plan the urbanization so that's our main job. If we are hired for it. Also we manage the construction of the re-urbanization and we do the social work while the resettlement in process. I don't know if any of the case we have a proper approach on water. Of course, when we are building and planning, we think about the water. And when we are managing the construction, water is an issue. But in the social area, if we have how do you use water, better uses, what's a good or bad water, brush your teeth with what water. I am not sure. The social work is all about this polite knowledge, and society working together and I think they do better uses of water or taking care of water but not lack of water. Or if you get water from a dirty place, the diseases from water. You have a lot of problems with floods, floods in São Paulo. So sometimes sure we have a proper action of water, talking about floods, rivers and sewage more that way.

JB: How is water delivered to informal settlements? Do residents have to go to a water distribution point?

SA: Sometimes, it depends. If it's a very new area, we are going to start our own favela so we settle very far from everything. And there is one pipe crossing. Sure in a week we will have neighborhoods. We break the pipe there and we get water for us and our neighborhoods live in behind. If anyone complains, now this year is a election year, of course the mayor and the candidate and you don't have water. In one month they will have water.

SA: If its brand new illegal settlement, you will not have distribution center. But one tap in the street where you get your water. But it's really uncommon and only for specific situations. Because nobody settles where they will not find water or electric power or they are running away from the city. Probably everybody has their pipes connected to the net. Those I told you. Not the disposal of water and much more of the approach of the water pipes.

JB: If you could change something about the delivery and management of water to informal settlements, what would that be?

SA: Its about lack of areas focused on new settlements. Like bring your favela to us, we like it. Get marginalized away from the city. If you don't have a place to live, we just have these neighborhood who has just roads, electric power and water. And you do your own place here. This is what I would do. Better indeed if to block the services at the limit of the city. You put big boards that say you don't settle after this area because we have our watershed areas, that is manancial, that our the biggest favelas in SP. Water is not the biggest problem in favela, it is the sewage the trash and the diseases and of course violence. But sewage and dump your trash and diseases are the biggest. Talking about social services are health

and sewage. And I would say violence but its inside the favela, and it's not because they are violent people because they are poor people. Very low violence comes when you have a proper money so you don't live in a favela. The violence comes from lack of opportunity. Not because of the favela, you can live in a favela and earn your money and not be violent or criminal.

So what I would do: SP doesn't have a master plan telling where there will be new urbanized areas for favelas. We need to assume that the favela is a typical Brazilian thing, its not just Brazilian but the rest of the world, people come from the NE thinking that they will do a favela. They come here to build their houses in the favela. So we need to have it as our own and treat it as our own. And bring the solution, if you are brand new, and you want to do a favela, do it there. You will have the water, sewage, drainage, electric power everything regulated. It will be much easier then resettlement. If you want to live in a tent, you live in a tent. I will not destroy your freedom of living in a tent. But some people in the favela have a lot of money and could live in something better. But the city needs to provide the social and public services. You just do it raze all the favela and build it back up. Point where it go and do it before the favela gets there. My idea would be this: bring some places where the favela can rise. Of course it is far away but that's where it goes.

JB: Is there anything else you would like to me know if you have not addressed it here?

SA: I would like to know from you what is your perspective, what is your project. Its not about water its about re-urbanization.

JB: I would like to know how the city operates and how its been changing policy to address the issues of informal settlements.

SA: I would go in the sewage direction because the water is not an issue. Even electric power is not an issue - because it is cheap to get it. It's easy. People don't survive without these two things. If you ask in a favela, what would you do with the sewage? Everybody would say is reurbanize. One of the main things to prioritize the favela, it is the sewage. If you get a clean area, it doesn't get sewage can cause smell, the pollution of river, stream, small river and flows to one of our reservoirs, we will have to treat it harder because of the amount of sewage we are producing. It's stupid to leave the favelas there without sewage and not treating the sewage. The more important are the one causing the biggest impact - violence and pollution -yeah just these two. But the pollution is divided between trash and sewage. Of course, if the location is in a rich neighborhood and politicians cross them everyday and if you have an organized group in the favela, you have a voice to speak. A lot of favelas have a social organization and they have better achievement in this kind of work. And the city does it, it stimulates the organizations.

JB: I just read about the favela social organizations.

SA: UMM um grupo forte. Another thing would be….sometimes I question myself: Is the favela a worst living situation for the people who live in the favelas? If you go to the NE inside the country where you have a lack of water, food and only sunshine. You get to SP because it is the land of opportunity. You get here and you live in a favela. Is it bad for this person? Was it an improvement. So the city swallows you, you need to earn the money to live there. When you lived in the field, you don't own things but you don't pay nothing. Once you live in the city, you pay a lot. And you need to provide. If you don't work, and job is a problem. You are a real crush bad situation. If you live in a favela, and you don't

have a job - You will addict to the violence and to drugs and all things that come with it. The favela is a bad company but for some people in brazil its not the worst situation I send people live in. probably all the maids in SP live in favelas. Her brother is probably a criminal but she is a good person. She a family, kids and husband. But what makes the favela a bad place to live is the violence in your neighborhoods and lack of opportunity. If you have a job opportunity, you would first raise their kids in a proper way. You can see it. Because old favelas get a very interesting landscape. Sometimes you see them with brand new color, nice windows, nice shelter or it's the house of the gangsters of the drugs or the kid got a very nice job. And he is studying and earning 2k reais. All of sudden you get extra money inside the family. The opportunity does not make them leave the favela. This is another point of view of why people don't want to be resettled. Because they don't want to cut their roots then of improvement. It is much more important to buy a nice television than improve your house.

Daniel Henrique

Central Manager of SABESP – interview conducted on January 29, 2010

JB: So does the city with an area that they have laid out the infrastructure?

DH: Actually they sort of have a plan heading for urbanization in the major favelas in the municipality. All we do is try to organize our expansion program. We have some spots that are favelas but our urbanization expands yearly, 100000 connections. Let's say 10% is favelas or less than that, maybe 10 or something like that. We have an expansion of the solution at work collecting sewage as well. This situation concerning water and sewers are the same. The point is we have to expand our system. And the favela is just a special area to have be worked in. Let

me talk about some constraints that we've got. Usually a favela is established in a public or private land. So we have a restriction to put infrastructure in these areas. Only do that if the courts decide. Because we have had problems to try to put infrastructure on private lands. And the owner starts to argue that SABESP is doing some sort of incentive of invasion. Now we are very careful about that. We just come into it if we have the decision from the court to go there or its an urbanization process with the municipality, Usually when the municipality decides to implement urbanization in an area like a favela usually they are looking at this part of legal possession of the land. So okay we have some sort of legal constraints to do that as well. So we have a technical issue, that's okay we have to have an urbanization process. We have a legal issue, that both of them must, both conditions must be filled. Usually for the company, its an interesting area to come implement infrastructure. Because we have a lots of people concentrated in an area. Apart from what we are addressing, we are putting an action in one area that we usually have very poor conditions so its now our social work that is a part of the mission of the company it's usually got some pretty good figures to implement that. It's a big problem and a big city so it takes time.

JB: And when you say you have good figures from when you put in the infrastructure? Is it the water use? Is it low?

DH: Good figures means when we conduct such kind of analysis let's say diseases due to connection with poor water quality or contact with urine such kind of things.

JB: how do you monitor the water use from each favela?

DH: No, not from the favela. We monitor the water quality from the whole city. We have here in SP we have a 3.5 million connections and 17.5 million

inhabitants we actually are obliged by law to control the quality at the tap at the incoming meter set, that's our delivering point. So we have a monthly evaluation of the water quality and we have to send all this data to the state, the state health secretary actually they control all the activity. We have a national standard that we have to fulfill so a favela is just one modal point, absolutely equal to the city. There is no reason why to control them in a different way. A favela is a regular connection like right here where we are. So we have the same kind of control, same level of control. Take care of the question: I am talking about favelas that have already been implemented an urbanization process and we are absolutely conscious about what we have implemented with infrastructure. Usually an illegal favela has an illegal connection that is a mess. and we cannot take care of the illegal connection because we are a regular company.

JB: how do you find about the illegal connections? Or do you look at the pressure system?

DH: It's very easy, you see them. Its not hidden its open. It's a kind of social situation that you cannot….if you have an illegal connection, and put a pinch and so on. We don't do that. What we try to do is monitor the amount of water that they are using just to avoid….although they use water from an illegal connection its very inefficient. But we try to put some sort of control and we also try to negotiate with the households we try to negotiate through…lets say have a control…they look at the consumption of the water. We have some specialized crew, we call community agents, that we try to have a straight link with the community. Through these guys we have a sort of lessons about how to use water, about environment, about uses of the sewer system, because later on when we start the urbanization process this contact with the community has been already

made and makes things much easier. And this is a kind of long-term approach, we go into a favela for 2-3-5 years and one day when the municipality decides to make an urbanization in this area we have already made these contacts. And sometimes we can eventually make a regular connection in the front line of the favela and we cannot go inside because usually the front line is usually in a proper road. We do something like that to organize al these connections here. And through these people we try to have a relationship with this community because it is a long term approach. Its how to make a bridge from the formal world to the informal world.

JB: do these community agents, do they make them pay for their water use?

DH: But it's a very low amount. One law, in what ever favela that we have infrastructure implemented they pay something we call social tax/tariff, about 4R, let's suppose it is 2USD per month for 10m3. Actually its very cheap and its only for favela. If they have a higher consumption than 20m3 they come into a regular tariff that is much higher. Through that it is an incentive to control the use. On the other hand, its feasible for them to pay because it is very low. 2USD per month is very low. This kind of approach has been working for the last ten years for dealing with such abnormal situations. It doesn't mean it's the best way but lets say that I believe, I have seen examples like in Singapore like big cities with favelas, they can urbanize these irregular settlements in 20 yrs and 30 yrs and if you look at sp 10 years ago a lot of big favelas have been urbanized. The process is on the way but it takes time because it is a big city and we are a poor country so actually we are not so poor. The point is that there is a big difference between the rich and the poor. The problem is that difference. I think in 20 years time the situation will be under control.

JB: so let me just repeat: SABESP goes into a favela by court order, city approval through the technical and the legal.

DH: And when we have these two points, it doesn't mean we have condition to we have to obey the conditions of the technical and legal issue. Its part of our job since we need to expand our system and we have a mandate to supply water and sewer services to every house in the RMSP region.

JB: Do you have any problems, an issue about sewage, with the treatment of sewage from these areas?

DH: No, everything is a domestic issue. What's the problem? Lets say lack of understanding how to use properly the sewage system they like to put that as the garbage. We have frequent problems of sewage blocked and that's why we need to have access and maintenance because we have to put a truck there with some equipment and we need to make a maintenance there. And in favelas its quite often. Lets say its more often to have problems in the sewer system in the favelas than outside the favelas. Its not a problem, we may spend more money in maintenance there but its not 10x more than in a regular situation.

JB: you guys do not have any environmental concerns that make you guys go into these areas?

DH: Depending on the area, I was going to say that. When we are in a watershed that is a surface reservoir for treatment like we have in the south of SP. We have a line that says that you cannot treat that water in the watershed and on the other hand the city has not controlled the invasion of these lands. So we have two problems: the presence of the favela in the watershed generating sewage and what not and we have to collect and pump that outside the catchment and deliver it to the treatment. I think in the end for the RMSP this is the worst problem. We have

a legal constraint to install the infrastructure. Second point, we have a very careful operation because when we stop pumping the sewage of one community it goes to the watershed. And it's a very expensive operation in these areas. When you are in a surface reservoir, those constraints I talked about in the beginning are stronger. That is not a private land or a public land. No we have a state law that does not allow us to come into and there are a lot of people living there. We need to have a special agreement with the deputies and high level courts. Its an institutional agreement that takes time and is extremely expensive to implement infrastructure in these areas. Usually we have support from the World Bank and now we are having a big loan to do that as it was done 10 years ago. People are starting to come into that area because the city does not control and so now again we are doing the same. In short, we have a serious situation of the water and we spend a lot of money at the treatment plant to have it at an acceptable level.

JB: is there something that you would want to change how the city operates or mandates infrastructure?

DH: The point is if the public infrastructure works, this situation will be controlled in 10-15 years and I have been working for SABESP for the last 6 years. The wrongs are repeating the worst example is the reservoirs. When the slums are in an urbanized areas, I think that the state or municipality has a more efficient approach. We have much more favelas urbanized now than they are investing in urbanizing. But when we are in a surface reservoir all the interventions are extremely expensive. And as they spread in the area, it's harder to control. Politicians are politicians, they are looking for 3-4 years of life. They are only thinking about the next election. Such kind of control needs 10-20 years. So society needs to be extremely organized to put pressure on the municipality to

be effective on that. Again on that point, good education its an area that is not very seen. You will not see a favela on *Avenida Paulista*. But if you are very far from the center or far south. Its not how to change our approach but how do you make the public structure to work in that direction. But not the duty of this water company, it's a question of the society and the public structure because they have the police power. Who has actually the power to control of the situation? Who it is the municipality. One of the problems of the favelas is extremely expensive to control. And what I am seeing is repeating, it is better to have a better approach to an urbanized area but when you are far from that I think the problem is still the same. What positive aspect that the RMSP is that it is growing slower, less people moving to these areas but when you analyze the fastest growing area in the RMSP, in this area, very poor settlements and not only a favela RMSP is growing at 3.5% in this area it is 6%. This imposes that we have a late community.

JB: Do you also think that the cities that neighbor each other do not have a relationship?

DH: It's very hard. If you have a picture of the RMSP, in fact, the border of SP and SB, it doesn't exist. It's not relevant for the daily life of the city. Its almost the same. The point is the same even with the similar points. Effective control of the land is all of it. Is as bad as in SP, Maua and SB do Campo.

JB: Do you have any information about the community agents?

DH: Accessible yes, the whole RMSP there are five business units and we run the RMSP. I am responsible for the central business unit. Marginal Pinheiros, Tiete, where we are, in this area, we have four or five community agents that establish the relationship with the favelas in this area.

JB: They go out and see?

DH: They are actually a branch of SABESP in the field. For instance when we urbanize the favela and we make 300 new connections, we take a mobile branch and it stays there and also in this bus we have a seat where we can have a lecture talking about how to use the water, control the water and even look at the bill and they are not used to the bill. This is a very nice work because some of these people don't have a document that they actually exist. I have a bill here. So if I want to go to the bank, they will ask for a proof of residence, so if they have a water bill from SABESP, they want to buy a chair or something, they use the bill as a proof. So this is kind of a social upgrade and this because these guys are respected in the community. We are moving these people up for 4R or 2USD. And when we come to an end of the urbanization process, it's very nice. It is surely you will have a maintenance work because some people will pay for two months and stop paying and you will have to go there and negotiate and so on. These kind of areas are not effected by the water because they actually make a legal connection. Its better to negotiate and make people pay. We do have a different approach for the very poor areas within this perspective. Its very nice because we receive some letters from these new customers because they can buy a new TV because of the bill.

JB: That's it for my questions. Is there something else you would like me to know?

DH: I'm not very much involved, what kind of material are you producing? Are you just stating something - What is your plan so I can suggest something?

JB: I am comparing and contrasting the process of urbanization informal settlements.

DH: In my view, it's more effective if you can have a talk with a community agent. You have to speak in Portuguese but the point is if I could make an assumption, what I would do, the planning stage of a favela in an urbanization process must have a kind of open alternatives to reach the resettlement, to reach this new urbanization process. As usually this state is a weak state, you cannot take that into consideration into the urbanization process. Even in the homeland in London, they have an area to stay and if they are out of that area they will go to jail. But here this is not working. Even if we are talking about homeland, they have a place to stay a bathroom. Even if you are in an informal area, they have a level of urbanization. Even though, they are not allowed to go out of that. Even in formal area, planning here in LA must have that in mind how to implement the urbanization process. If you talk to the people in the municipality, we have some people in the World Bank that finance this approach, they will have a good view of the process. I have no connection to this field. But I think you can try, I think you can have a contact with the WB with the projeto mananciais but its important that view from abroad if not from abroad from SP from the bank and its easier for you to do that in USA from the world bank from Washington. A good talk would be with the bank. You would have a good picture of the area.

JB: Does the World Bank fund the country then the city?

DH: They fund the intervention. They have a plan. They actually fund all the building works from the state or the municipality. It's a combination of funds. The World Bank has the plan and its performance indicators to check if the intervention is valuable.

Julio Accioli

Central Civil Engineer at SABESP – interview conducted on January 29, 2010[28]

JB: In your position, what is your involvement in decisions made about potable water delivery and allocation to city residents? To residents in informal settlements?

JA: As I was saying, this matter about informal settlements is one of the greatest problems we have here in the metropolitan region of São Paulo. A problem that any city in Latin América has, and here in São Paulo we live intimately with the problem of water supply, and the conditions, the supply of water itself are not very good, there are practically very few sewers. So we really have a problem, that for SABESP is a difficult problem to resolve, and we require partnerships, to work together with the city councils and the municipalities to resolve this matter.

JB: How does your agency deliver service to these areas?

JA: Obligatory, I would say it was obligatory but we have many examples where we've worked together. Many times, in some cases, the city council itself will contract us, SABESP passes money to the city council and the city council executes the projects - for example sanitary infrastructure, such as street pavement, drainage, etc. So sanitary infrastructure is also a joint effort. We always have great examples, I don't know if you have the time, but there are a few cases you should visit, where you really see advances in this kind of work. But I think, to be very clear, if there were not integration between the sanitation

[28] Transcription by Zachary Hurwitz, MA of Geography from the University of Texas at Austin.

company, SABESP, and the concessionaire, and the city council, it would be very difficult to resolve this problem. Because, let me show you on a piece of paper.

JB: Does your agency monitor water consumption across different neighborhoods? Formal and informal settlements?

JA: So, a very good problem that we have, I don't know if you're going to ask about this, but if I could add one more thing, because sometimes the sequence that you're looking at will miss something, so let me show you and we'll talk about it. In fact let me write down here the points that are out of the sequence that you have.

4:15

JA: There you have the two cases. There are cases where the service is regular. And there are other cases, let me show you, come here. Understand? A clandestine connection, you see, but it doesn't do anything. So that water is being used by people, but SABESP doesn't work in that area. So the cost that SABESP is paying today, where will that cost come from? From society, from the state, from the city council. SABESP is not a state company, we get paid for results, you know? We're listed on the stock market. So there are cases where, what kind of problem do we have? In this case this is an irregular area, an informal and irregular settlement. So SABESP is prohibited from entering there with infrastructure, we could be legally sued by someone, damn, that area is irregular, how are you going to connect water, a meter, and charge for the people to use them? So there are legal problems, you understand. So as long as the area doesn't have regular legal land titles, a regularization, a reurbanization, we can't formally enter with infrastructure. Just that the cost, there are people living there, that have to supply themselves with water somehow. The matter of sewers is even worse,

sewers are more complicated. Water, see, you do something to connect it, boom, easy. But sewage, there's a sanitary risk.

JA: Maybe you saw the plastic sanitary tubes- if there were a leak, and everything's going fine but Alicia suddenly sees pipes running down the side of the street, which could be full of some contaminated stillwater, and if in some moment there were a loss of pressure in the entire network, all the shit that's inside the tube could contaminate people. So there's a very high sanitary risk. Water that is supplied in these conditions, we don't charge for it, we don't receive anything for it. Now, there is a sanitary risk and in for sewers, it's even more precarious. Much more precarious.

8:07

JA: Just so you understand our estimates, in the metropolitan region, more than 5 cubic meters per second. More than 5 cubic meters per second- it's an estimate, the number is hard to measure, there's no proper way. It's an estimate for the entire metropolitan region where we are active. It's very expensive. And today that's almost 9% of the water supply. If you create a water budget, almost 9% of the water that we utilize is for distribution, consumed through distribution, and we don't receive money for that. We call this "social use" of water. - the social use of water.

JB: What kinds of information do you use in deciding how much water to allocate to informal settlements? And what kinds of information do you use in deciding when to do maintenance on the water delivery system to informal settlements?

JA: In formal settlements, we have a regular maintenance structure. In the case of water, if you have a leak, well we have two cases. Let's take the case of leaks. The visible leaks, there's a telephone assistance line, a call center, code 195.

Anybody can call SABESP and communicate that there's been a leak, hey, there's a leak on such and such a street, such and such number, and SABESP within 24 or 48 hours will activate its maintenance teams, our own or contracted teams, today almost 80% are contracted. So we have the case of visible leaks, our greatest added value is the telephone line, and the teams that we have, our own maintenance teams and contracted teams. This goes also for sewage problems, sewer structure, sewage flow, etc. So the teams are there to perform maintenance.

JB: Are there any challenges to allocating and delivering potable water to these residents that are related to other issues in the city?

JA: In the case of invisible leakages, we activate the cost. We activate the cost of the call. We have to go to the site with rustic research equipment, geophone, microphone, we are very active in these cases, and we've done a lot, so in the case of invisible leakages, the teams jot down, they register, and pass the data to the maintenance teams so they can repair the leak. So we have a whole structure for water maintenance in these 5 units, which are distribution and sampling. This is for you, it's the report from the center unit, and here you see the register according to distribution of sewers, where they occur, where they've occurred most, so we have this all registered. A regular maintenance structure. In informal settlements, if there's none of our network presence, it's more complicated. It's practically a structured behavior.

JA: Water gauges. 100%. All the connections have water meters. All of them. Even in these informal areas you went to yesterday. Each client that has been registered has a water meter. And we change them out periodically, in a maximum of 8 years.

JA: We have the social rates, yes. Social rates for slums, so if the register shows it, you receive lower rates. If you want to look at the values I can show you the values. But, yes, we offer those.

JA: The challenges are fundamental. It's a very large challenge, because, let me get a map to show you. Here in the metropolitan region, if you look at these documents, let me show you, there are some other patterns I want to show you. Look at what's happening in the metropolitan region of São Paulo. Here in the center, we're here. The population is diminishing here in the central region, it's moving out to the periphery. A region that already has infrastructure, and another that doesn't have infrastructure. You have to rush over there. This is an indicator of what's called social vulnerability- low income families- and over here there's low vulnerability, there are jobs, there are heads of households, the number of children is lower. This is an indicator that was designed by a Paulista institute, the Institute for Social Vulnerability. So you see that the vulnerability here in the center is low, and the vulnerability on the periphery, there's low wages, high poverty. So we have a challenge. Where we have infrastructure people are out-migrating; they're going to more challenging areas, more mountainous, lower wages, and if a company doesn't want a lot of lawsuits, it's a large challenge. The number of slums we have today is large. And we have legislation that protects the watersheds, and problems with the water, with ownership.

JA: Here's a map I want to show you, the map of the network. All this region here is the area of watershed protection. You have the dams, the headwaters, and another strip up here. And this area has a lot of pressure as well. A lot of low income settlements. And here we have the municipal area of Sao Paulo, the river Ipiranga, which is right here. Here's the water distribution network. Practically,

the formal settlements have 100% supplied. In the informal settlements, it's lower, 70%, 80%, there's a lot more to do. So we have here this dam, this river, it supplies 20% of the city. And this whole strip here has legislation to regulate soil use, but it's strongly occupied by slums, and so forth. And this water here receives a lot of sewage, it's full of phosphorus, algae proliferation, if you drink this water, it's difficult without treating it first. So we have pressure on these two rivers, we even have a World Bank program to recuperate these two rivers, the World Bank has invested a lot here. And now we have two other dams on these two rivers, exclusively for reurbanization, revitalization, to really improve living and sanitary conditions. And meanwhile not affect the quality of water, because we can't lose these two rivers. This one here moves 12 cubic meters per second, and this one 5 cubic meters per second. 17 cubic meters per second, we can't lose that resource. We can't. If we lose it, we'll have to search for more water.

JA: So there's a large concern in relation to some river systems. Other rivers that we have, this one here is 1 cubic meter per second, it's practically entirely protected. And here, very preserved, it has good areas; it doesn't have a lot of problems. The largest river is here. This little one here, so little it practically doesn't appear, has a lot of problems. It's water quality is horrible. So the largest concentration, what gets a lot of our attention, is these two rivers that are suffering from a lot of pressure from urbanization here. There are a lot of low-income individuals. It's a challenge. To guarantee to recuperate them, we have to recuperate lost quality and add quality. Afterwards, you can really universalize water supply and sewage. All this even when we're already providing strong assistance, they go to the city councils, show the city councils, because without them we cannot provide universalization. SABESP, only a concessionaire, can't

do it alone. And I don't have autonomy, nor do I have the competence, nor the power to regulate this situation. So it's with the municipalities, particularly in the matter of urbanization and urban problems, there we can add value.

JA: Another problem is the matter of sewage treatment. What happens in this area? There's a serious problem happening. For you to have a notion, in the case of sewers, we modeled according to sector, in the case of water, according to sewers, according to watershed, sewer, and here we added some indicators of urbanism, growth, etc. And the operational indicators, assistance, water supply, losses, water quality, we made a ranking. There you see the point rankings where the sectors with the greatest problems are. Obviously when you go walking through there, we have some sectors that have more greens than reds. So those are better sectors, less problematic. In the case of sewage leakages, it's more complicated. See this area here, this is an area that's growing a lot, a very poor area, and it has sanitary problems. And these cases here are more central areas with fewer problems. It's a method for us to orient our investment. But the people who are living here, we have these river sheds, what happens? It's the classical method of the system of the rest of the world- we have the watershed, its effluents, and so on, so we need these margins here, deep in the valley, that's where our sampling trunks are going to go. Trunk men. And the networks here, here, and here, we have interceptors that go the treatment stations. That's the classical way to do it. Here, we have a different system that runs by absolute separation. Drainage, on one side; sewage, on another. I know that in the US it's a mixes system, you a mix of the two systems. Here it's a separated system. So sewage, that's one area, fluvial water another, then rain, drainage another, another sewage. Here it's only for sewage, that's it. So what happens? When you go into

the slum, into the informal settlement, well into the margins, the water runs this way, and the houses are over here. When it's that way, you can't get the staff in there. There they know, here comes the staff, so here they throw the sewage in the water, and sometimes it continues down here. And the river is polluted. It's a real problem. Today we have programs with the city council that's called "Run and Clean." The people here are living in this water pollution and there's a lot of work to be done. It's essential to work with the city council in these areas because we need a strip, an area at the least, we ask 6 meters to operate. So some residences are going to have to be removed, the city council is going to have to remove those residences, house people in other places, so we can move the sanitary infrastructure in. This is work we've been doing for the past 3 years. You have an idea of what I'm talking about. And we're only doing this right now in the municipality of Sao Paulo and the city council of Sao Paulo.

JB: Are there any challenges to allocating and delivering potable water to these residents that are related to other issues in the city?

JA: We also choose those which we prioritized, according to each one's situation, data, population, density, here on the maps. So this is the reality in many cases. And it's very common. The rivers are totally polluted, dirty, full of rats, trash, a horrible sanitary condition. And now through our partnership at least we try, the city council would have to remove some people. If they could reurbanize the entire area, even better, because there it equalizes the situation. We're making the timelines with the city councils. At least in the case of the sewers, they could move some residences so that we could move in the staff and equipment. So in this program we're working in this way. Even if you don't resolve everything, at least leave a strip, an area where we could enter in and attend to the sewers. We

want to at least treat 10,000 liters. So we base it on priorities, some urbanization processes are easier, some more difficult since there are a lot of slums. So these are codes that we're working out with the city council. If this partnership didn't exist, we wouldn't have a totally cleaned area, and all the sewer samples would be sent to treatment. So it's a program that has been working well inside informal settlements, reurbanization, but at least we need a strip where we can enter with the infrastructure. We've been working on this and have to universalize it, universalize the treatment, which is the hardest part. This is how we win here.

JB: How does your agency work with water users of informal settlements?

JA: So you see the following. If we don't count on the city council to act in a proactive way, efficient, together with the informal settlements, it becomes very difficult to guarantee regular assistance. There's the kind of assistance I showed you, precarious, with no safety, you understand? So it's a problem here in the metropolis of São Paulo, you already know this, it's a complicated city, difficult, many problems.

JB: How is water delivered to informal settlements? Do residents have to go to a water distribution point?

JA: We have this problem in the formal areas. Today the water supply we can say is good. It's good. Some years back I would say it wasn't so good. We had water rationing. Today we have practically no rationing. There are some points where the service is intermittent. Very high, distant areas, there are still some problems. But we're talking about 5 million people in rationing. In 1995, we had 5 million people in rationing. In 1992 there were 9 million. Practically everyone was rationing. 2 days with water, 1 day without it. Today, the water supply is stable, and the water quality is good. It's not so much about quantity. So the greatest

threat is if you lose water quality in the rivers, it presents difficulties to treat and distribute within these patterns. This is the greatest challenge. Still in sewage we have a lot to do. In the formal areas, principally the municipality of Sao Paulo, the sewage network is almost complete- there's some area left for treatment. I'm speaking slowly and easily, can you understand me? I'm trying to speak well so you can understand.

JB: What are some challenges in delivering water to informal settlements?

JA: Here we have areas where we do the work with communities, each year together with the people, informing them. But, I don't know what type, in what measure this kind of work leads people to not receive water in a regular way, but in my mind many precarious settlements already have regular service. So this is community work that SABESP does that I don't know much about, but I know that they have regular service. So all the areas, all our units have community work, they have social responsibility work. It exists; just I don't know much about it in detail. I think it includes environmental education, public health, waste, etc.

JB: If you could change something about the delivery and management of water to informal settlements, what would that be?

JA: Informal? In water distribution? Today we have a lot of questions, about losses. Losses. So we have a situation where the area is being polluted, the matter of losses, and our great dream is if we had more materials, but we have a cost in materials, something that has existed for a long time, it's very bad, we have very horrible materials, old materials, horrible, so we practically have to exchange jobs in the long run, and change this. So my greatest desire is to really have the condition of renovating our network, to substitute for good quality materials, so that we reduce losses. Because, I think in terms of supply itself, water quality has

legislation, we try to follow the legislation, the pressures in general are within these norms, we have some points where the pressures are higher and others within the norms. In general, urban sectoring is good. I wouldn't say it's great but it's good. So I think that the great effort that we have is in the management of our water system, seeking to reduce losses. We could compartmentalize more, substitute in new materials, to have better results and less losses in the future. Like I said, two rivers in Sao Paulo, they're distant. So we can't give ourselves the luxury of continuing to lose water. We have to act strongly in this area. We're very concerned about the losses.

JB: Is there anything else you would like to me know if you have not addressed it here?

JA: I'd just like to reinforce- I think that the newest thing in SABESP is this work. The Run and Clean Program. It's shown the necessity and the viability of joint actions in partnership between the concessionaire SABESP and the city council, working towards actually improving environmental and sanitary quality in the two river corridors. Urban corridors are always complex because any waste thrown in, purposefully or not, you throw in the gutter, in the street, that runs, and can compromise the quality of the water. At any rate, its condition has become much better, and there are cases where they're building parks, vegetation. I'd call to your attention that since 1991 the Inter American Development Bank has invested quite a bit in the metropolitan region in order to broaden the sewer system, part of which is getting even worse. Because we saw the following: just structural works are not enough. We have to intervene in the operation of the management of that area at the bottom of the valley, in the management of sewers, so this program has a rather strong operational component and partnership as well. So I'd reinforce

the point that in the case of a municipality that's full of problems like São Paulo, where you have an entity that manages, SABESP, in our case we manage water and sewers. And you have the city council, and the two have to join together to resolve problems that basically have their origin in the social and urban question, low income, and a lack of urban planning. This question brings a lot of problems to infrastructure. So with a partnership, you can re-urbanize, improve living conditions, road systems, drainage, and SABESP in this matter has to perform assistance in sewage and water. I think that we're on the right track. And this is a relatively new program, three years old, not even, but I see a very good horizon.

JA: There's a lot on the Internet, you have the website of SABESP. There's a lot. If you need anything in particular, you can send me an email, you know. Anything you need afterwards.

44:00

JA: That kind of report? We're updating. This here is the whole metropolitan region, in which I'd say we're going to have samples. SABESP doesn't operate in these cities here - nor here, nor here. A large part already has a network for collection. Water as well. There are still some matters on the periphery and what mostly happens is what I mentioned to you, that discontinuity in the watersheds and the river becomes polluted. So. That's the water map. Do you need any of the maps here? Do you have a disk drive? Let me see if I have an external hard drive, if not I can make copies for you, I'll take this document, cut it, and pass on the map to you. I can send it over email. The ones on water and sewage? Alright. These two here - I'll coordinate exactly what you want, the map, the metropolitan region, I can explain it to you and then pass it along. Alright.

Central Community Agent for SABESP – interview conducted via email February 1, 2010

WA: As coordinator of the Community Participation, I have no share in the distribution of water in general, with respect to low-income shares of regularization of supply is determined by the supervisor when the area is unaffected (formal authorization from the Council).

WA: The Community Participation program is a technician at each agency, when the client makes a request and is identified it is irregular area (slums), this request is passed to the coach to visit the site and identify what type of service is actually being requested.

WA: The program monitors some areas that had suffered some type of intervention on the low income population.

WA: There is one unit (MCEA), she does the program all kinds of service on the supply and shortage of water when this happens and the affected area is a low-income community, the technical community advises the deal community why the lack of water that period.

WA: There is no difference in the pickup and distribution of water for one or another population, the water that supplies a quarter legalized is the same as victualling neighborhoods and non-regulated water pickup occurs the same way, regardless of target audience, the challenges is the same one as well as for the other.

WA: No Answer

WA: Community participation to work in the communities of irregular areas makes an articulation work to try to identify local leadership, as identified leadership or the leadership, convene a meeting with the residents to explain the

importance of having the water settled and the benefits that this work brings to the community. Before the regular supply is a second step, guide the people how we should save water (rational use of water) on days and pay their bills.

WA: In areas of occupation irregular distribution of water in most of which are made through illegal connection to the residents make of their own distribution network Sabesp.

WA: There are a great concern regarding the water supply in irregular areas, given the large number of slums (169) existing in the city, the challenges are many, such as combat losses, the so-called irregular connections fueling community and formal authorization of the competent bodies, City Hall and the Public Ministry to settle the links.

WA: I would change the regularization process of water supply to illegally occupied areas. To settle the links needed for water, a vital life resource, the city agencies in charge of authorizing connections need to have an improved process of authorization and a process of prosecution for illegal connections.

WA: Working in the Community Participation Program is a challenge, first to develop this work one has to like the second deal with a public destitute in every way, third the services provided by the state for this population are disabled and the last lack of planning with clear actions and defined legal for these people and involving senior management of the Company, the state government and the municipality, or interested parties to tackle the illegal supply in the areas of irregular occupation.

APPENDIX C: HABI WEBSITE PORTAL

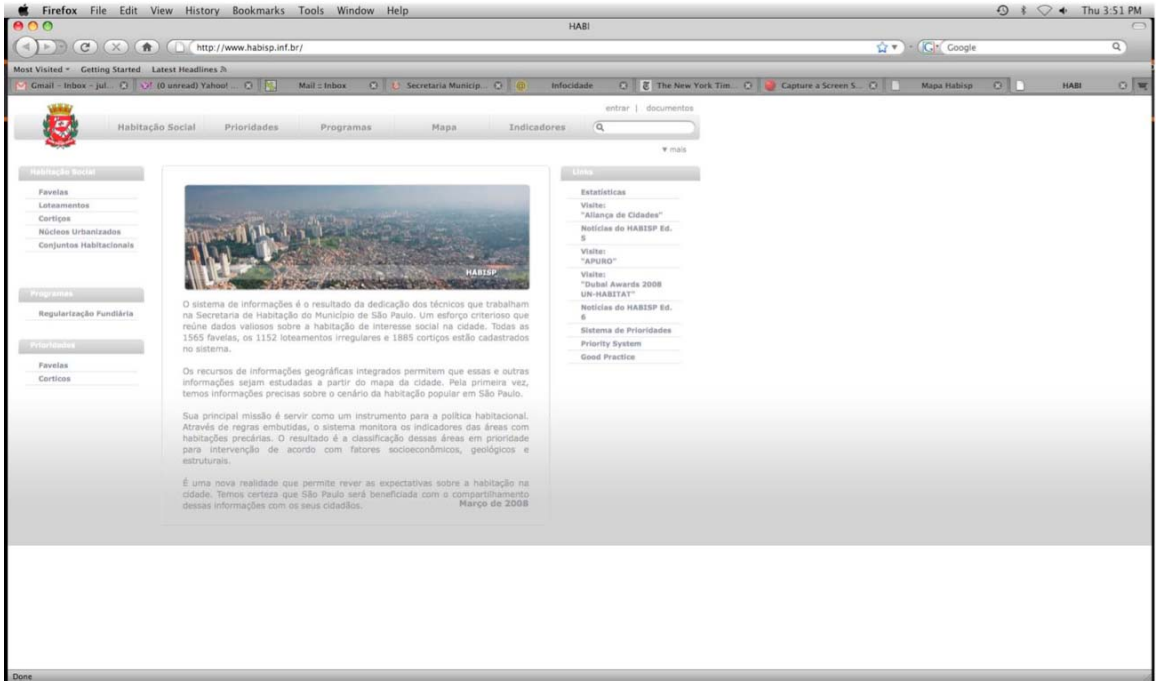

Illustration 2: HABI homepage

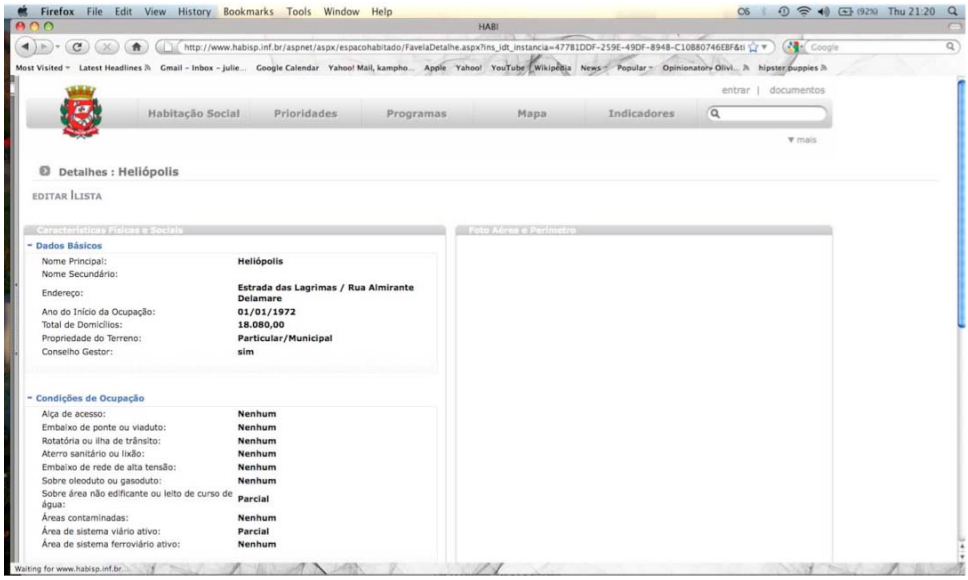

Illustration 3: Information page for Heliopolis

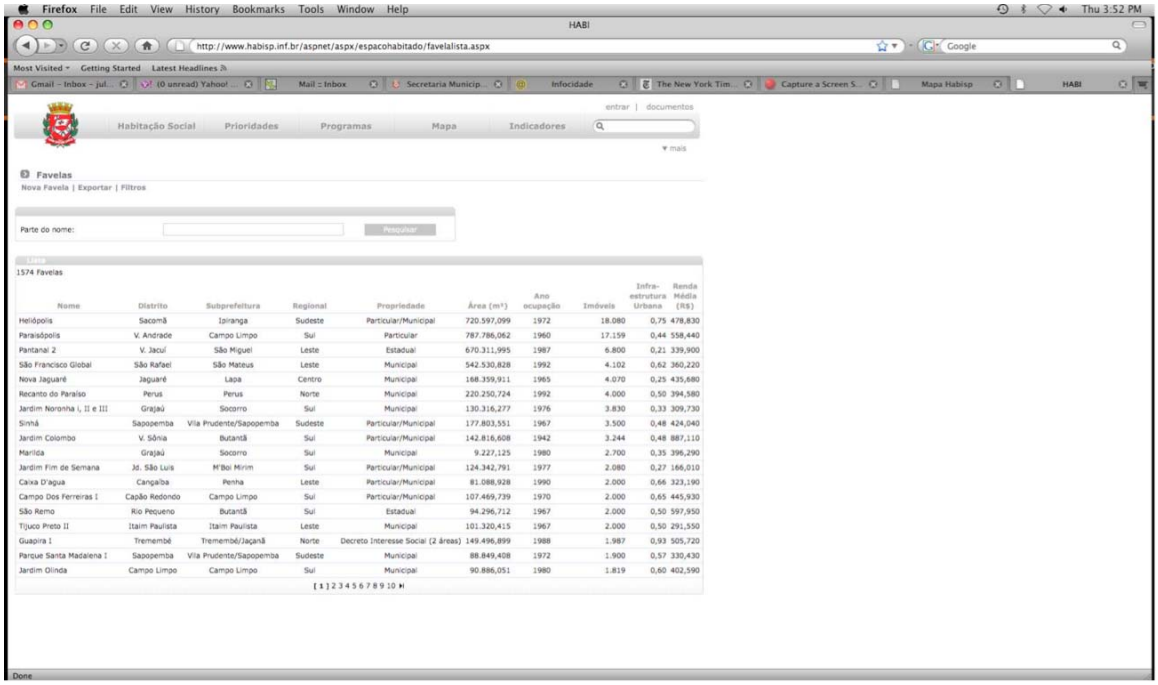

Illustration 4: HABI – Favela List homepage

APPENDIX D: PARAÍSOPOLIS MAPS

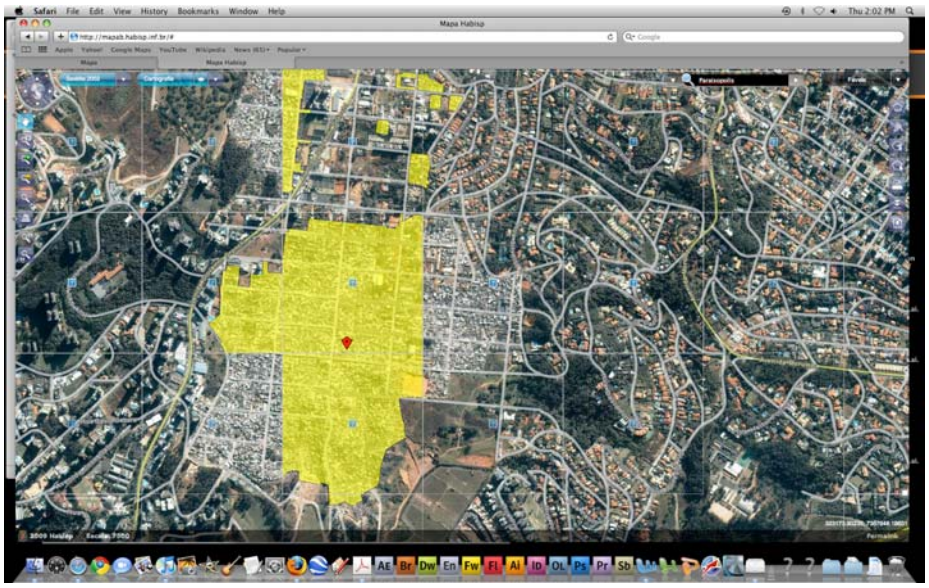

Illustration 5: Paraísopolis Favela

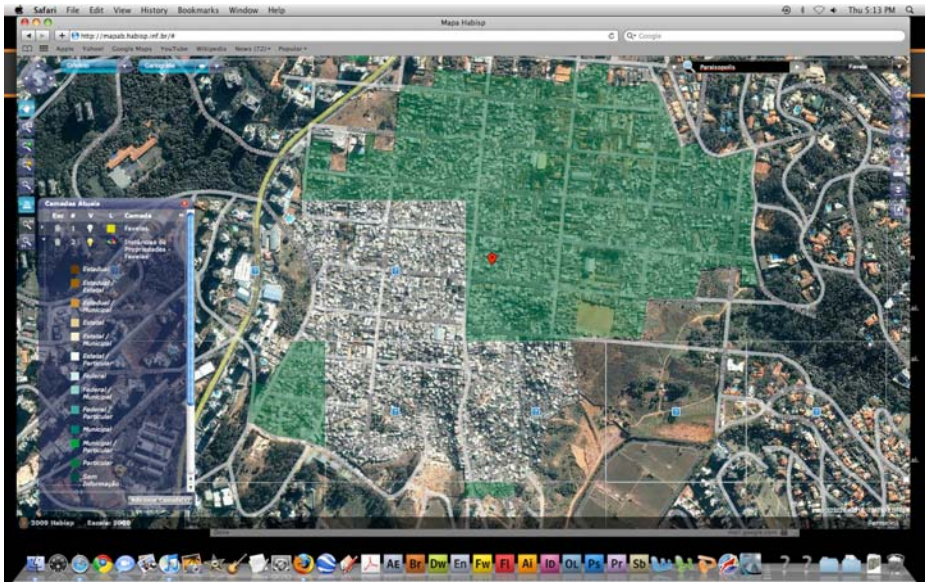

Illustration 6: Paraísopolis – Type of Favela Properties

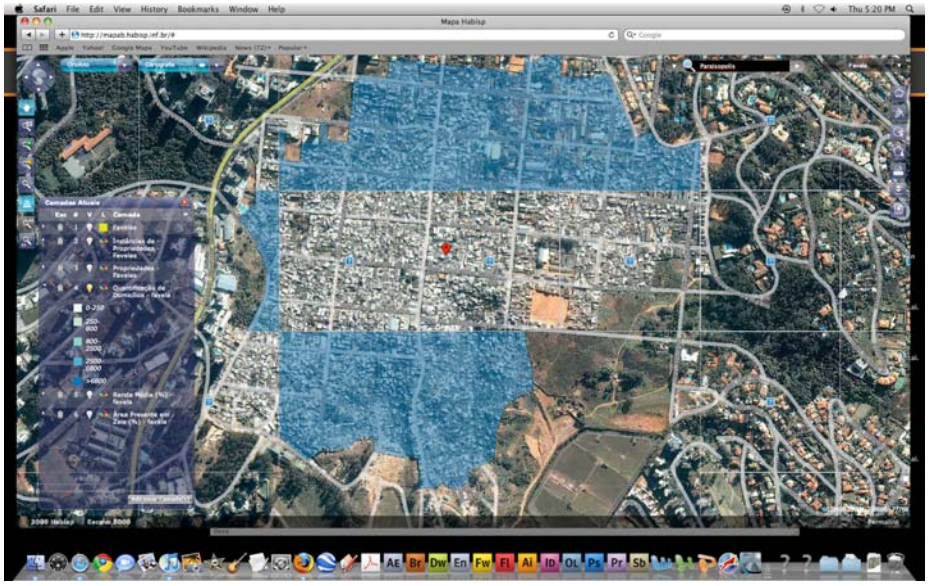

Illustration 7: Paraísopolis – Number of Households

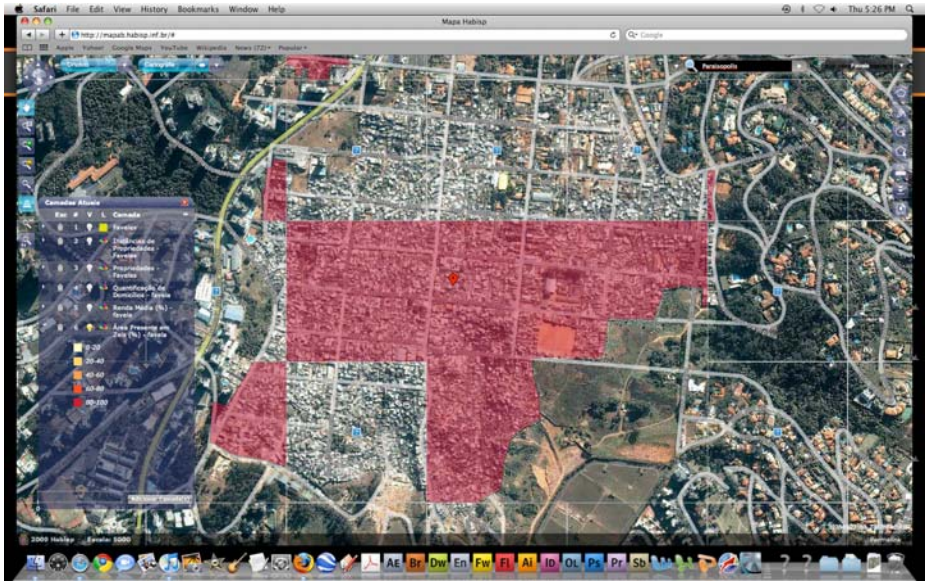

Illustration 8: Paraísopolis – Area in ZEIS

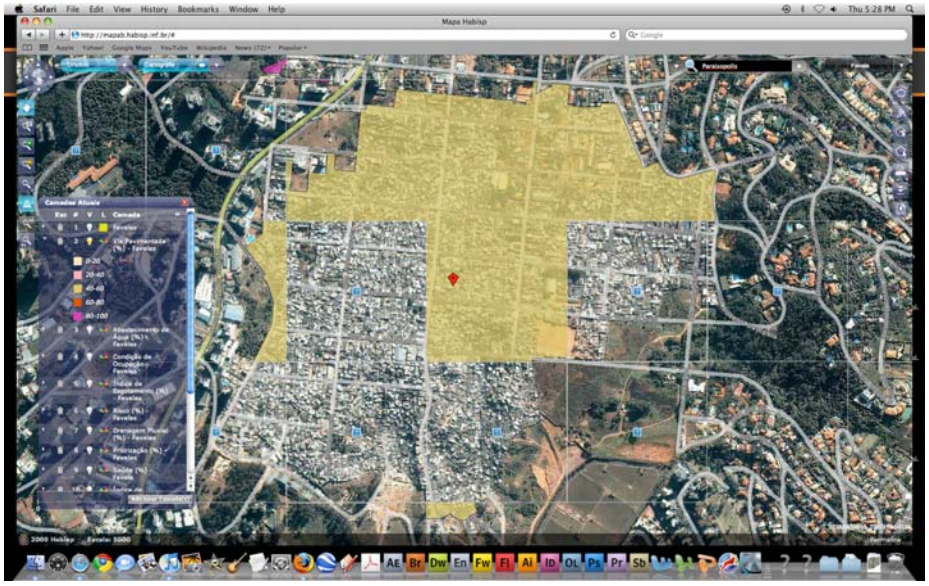

Illustration 9: Paraísopolis - Paved Road Coverage

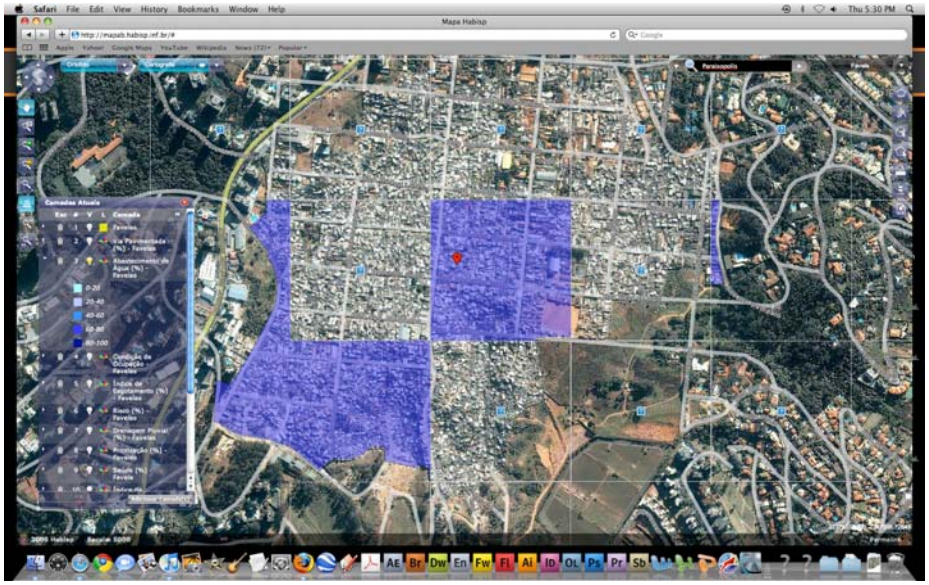

Illustration 10: Paraísopolis – Households with Water Supply

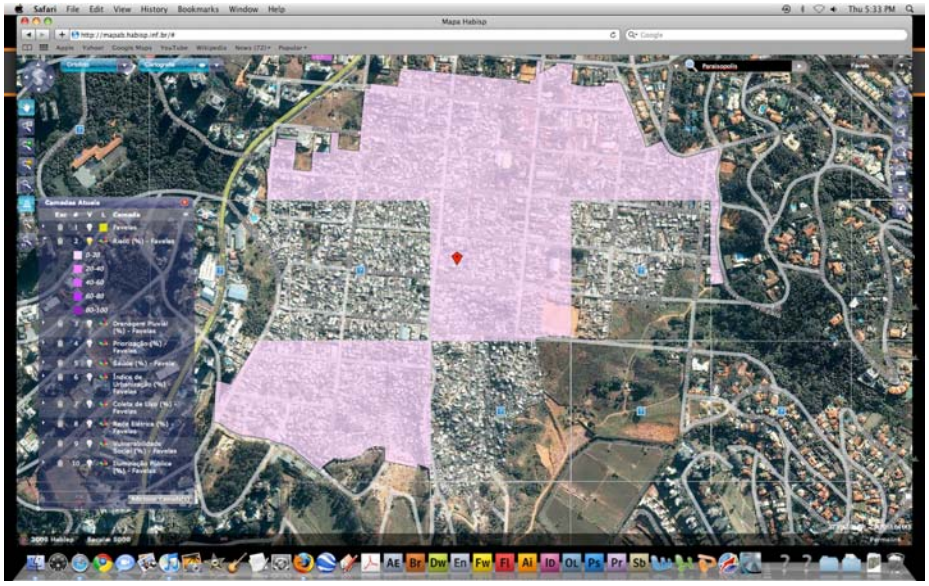

Illustration 11: Paraísopolis - Risk Index

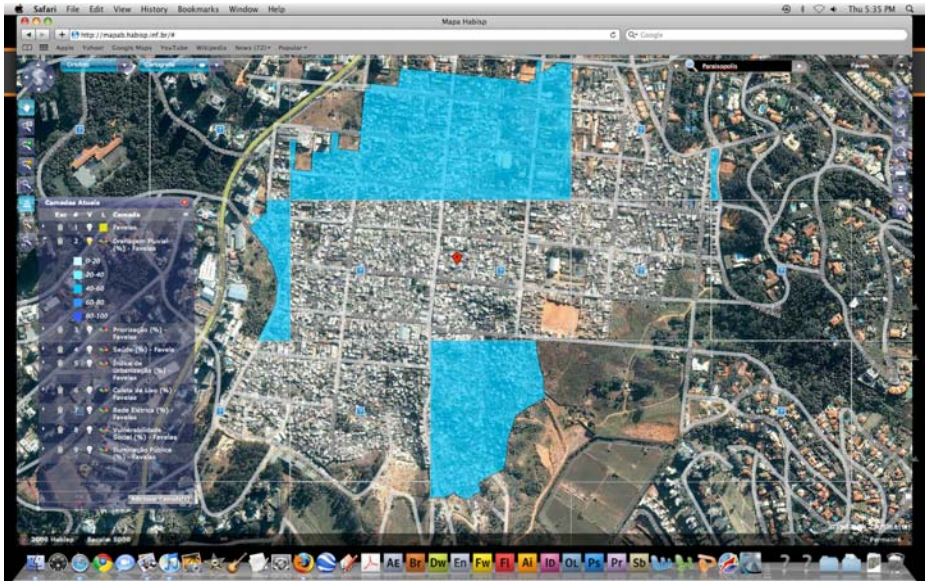

Illustration 12: Paraísopolis - Storm drain Coverage

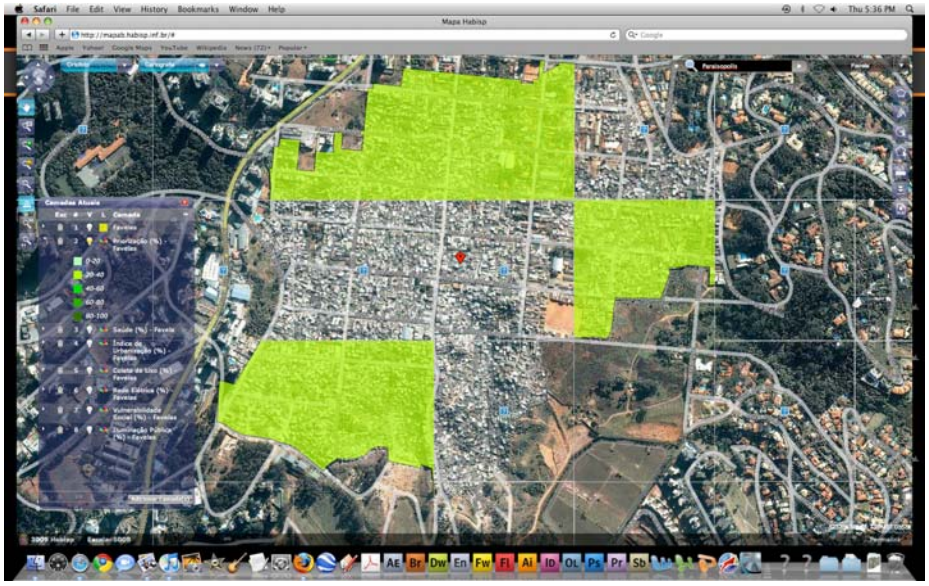

Illustration 13: Paraísopolis - Prioritization Index

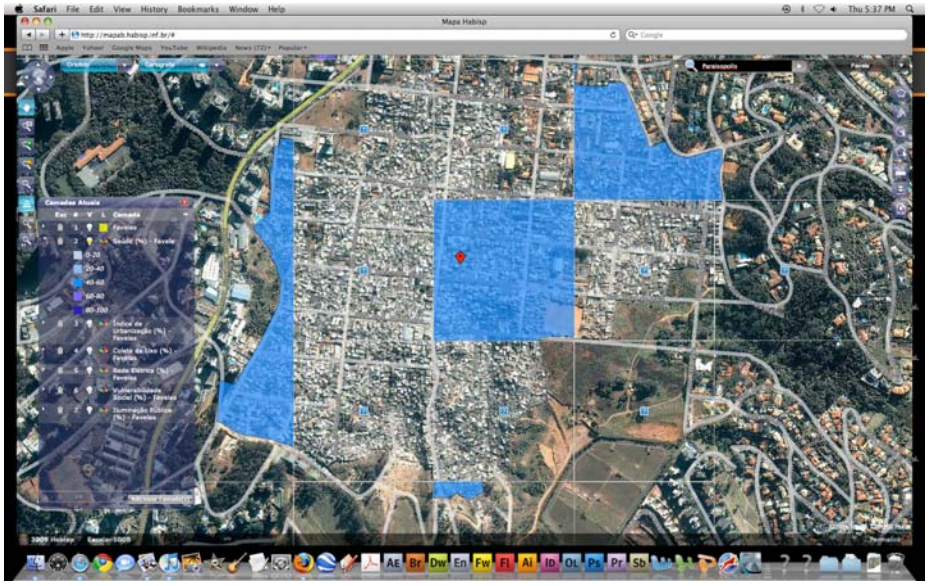

Illustration 14: Paraísopolis - Health Index

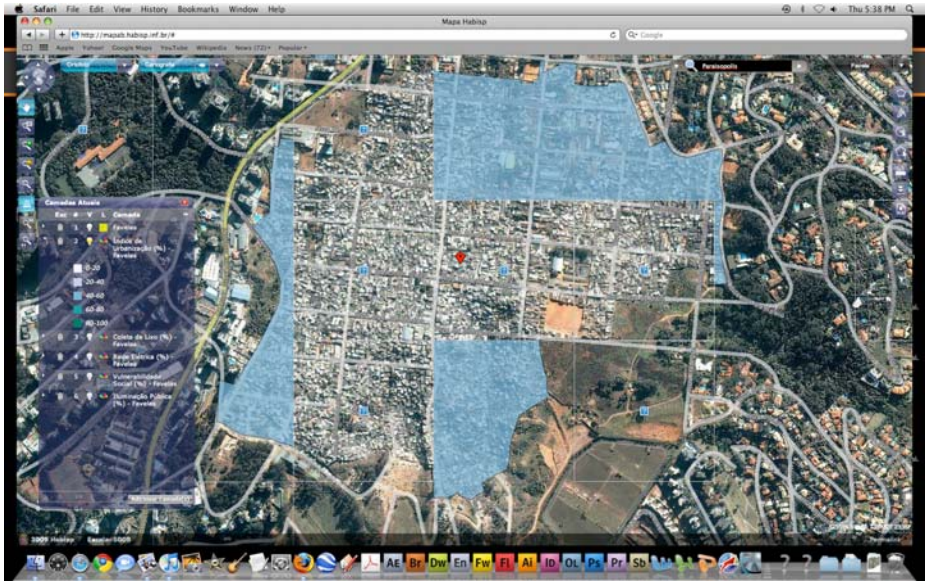

Illustration 15: Paraísopolis - Urbanization Index

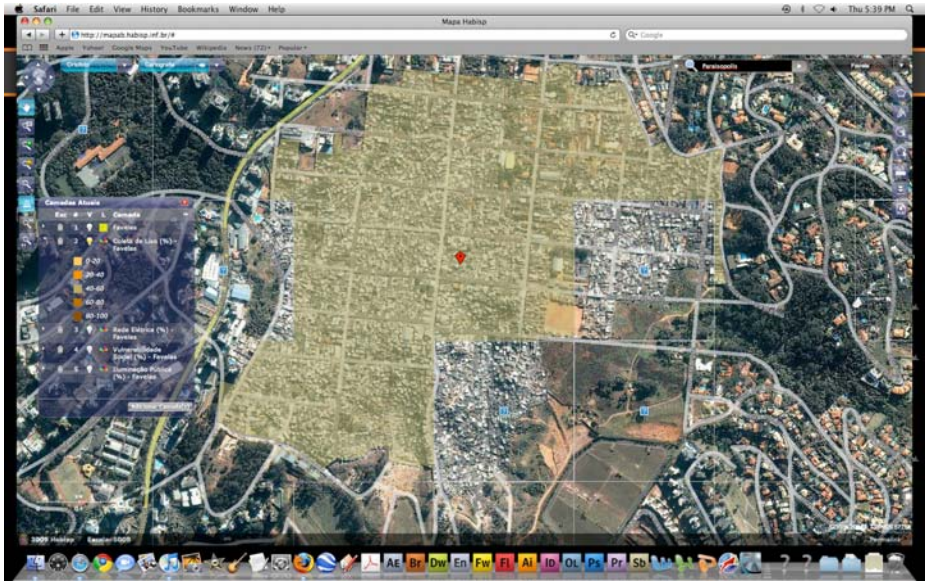

Illustration 16: Paraísopolis – Households with Trash Services

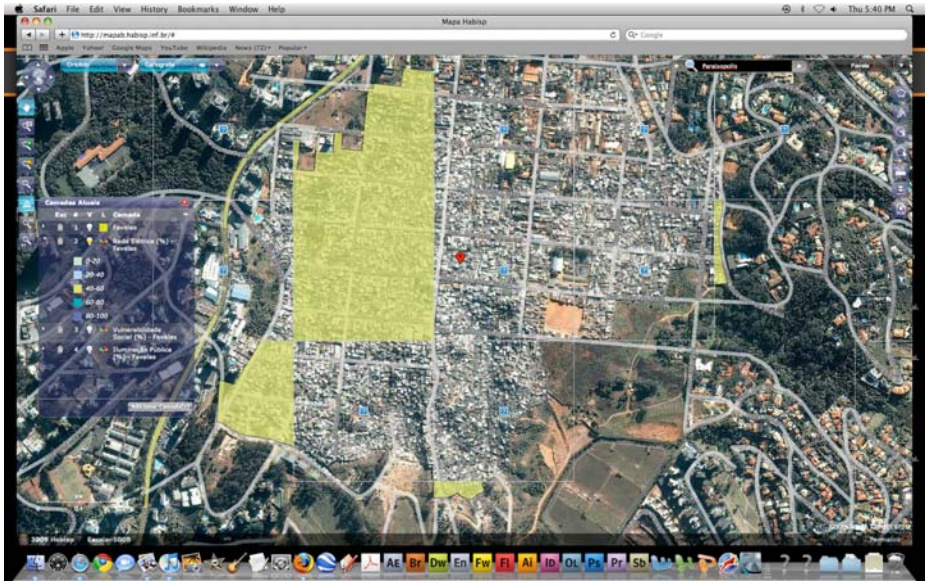

Illustration 17: Paraísopolis – Households with Electricity

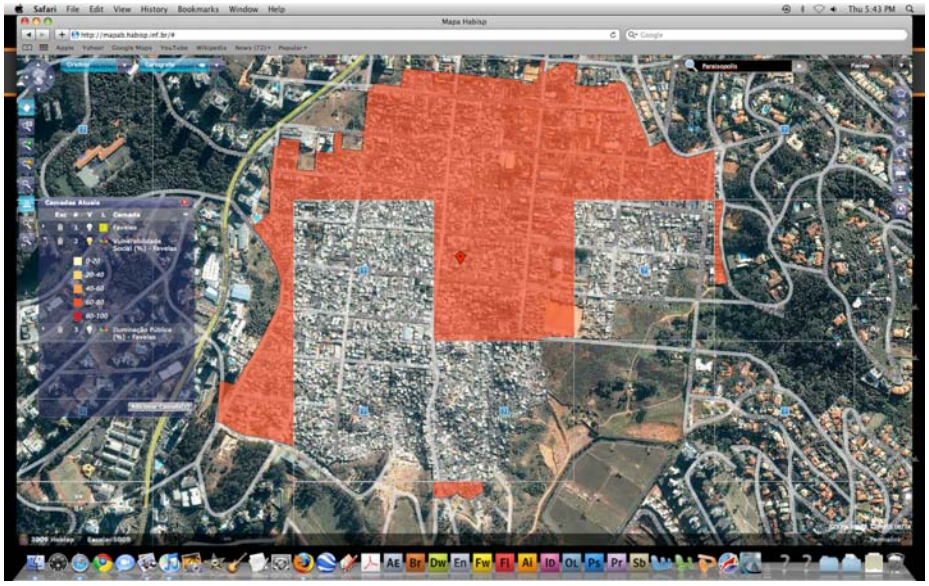

Illustration 18: Paraísopolis – Social Vulnerability Index

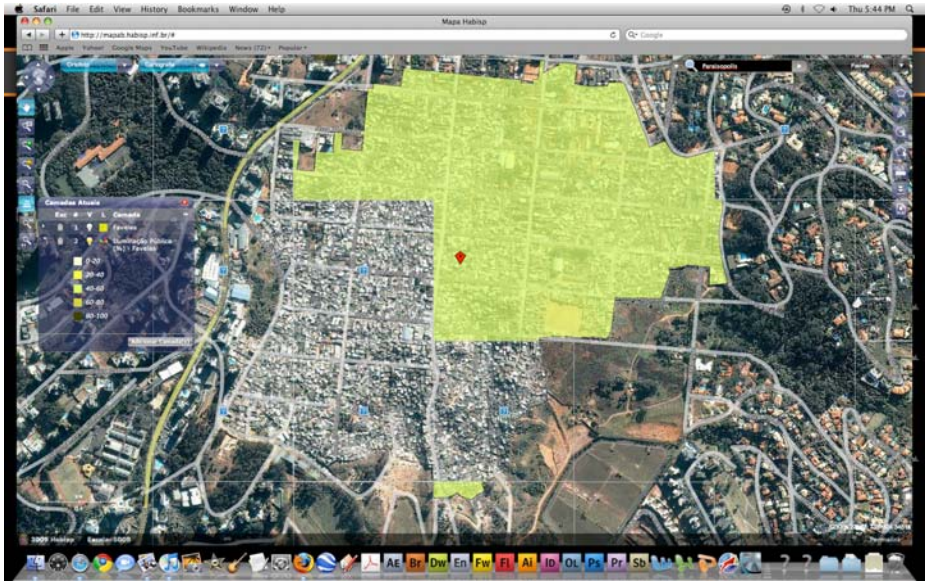

Illustration 19: Paraísopolis - Public Lighting System Coverage

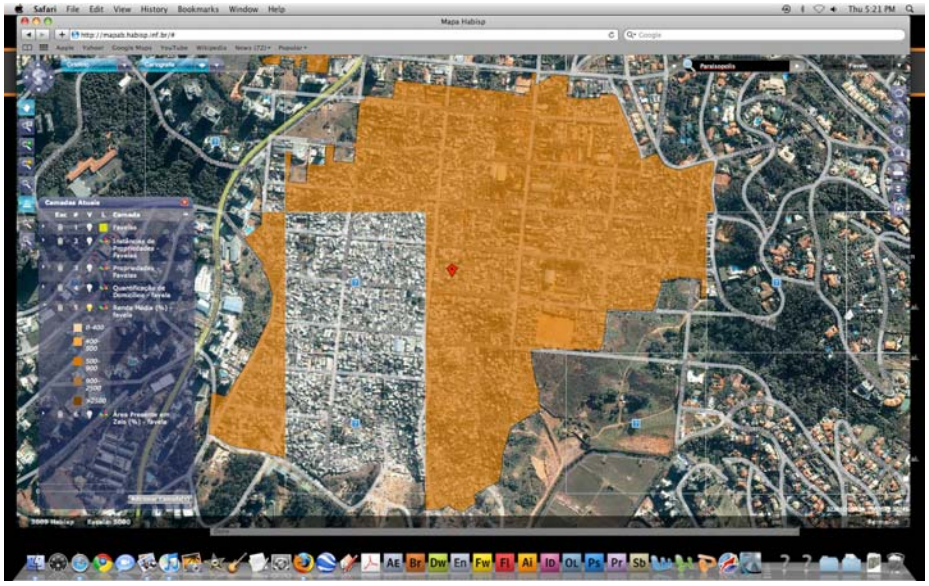

Illustration 20: Paraísopolis – Median Income

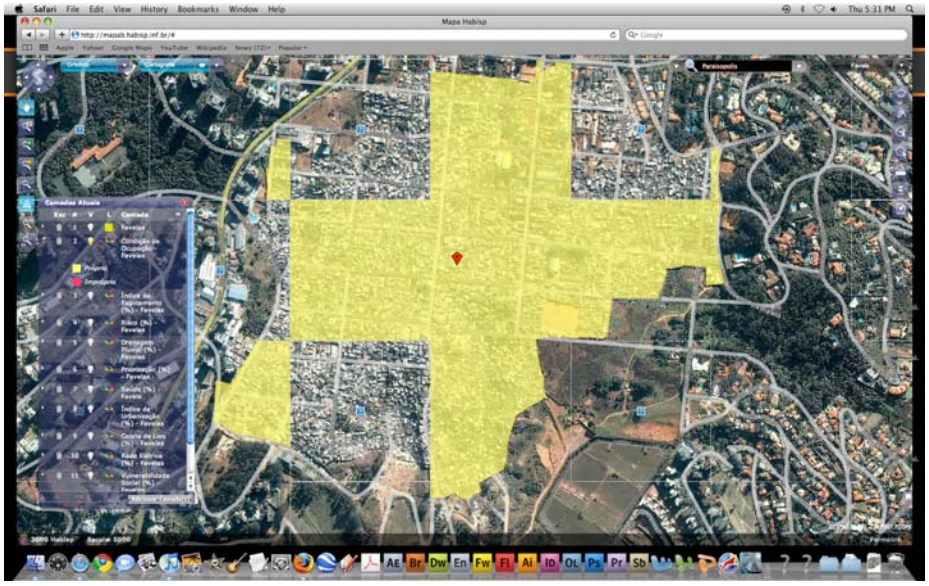

Illustration 21: Paraísopolis – Condition of Occupation

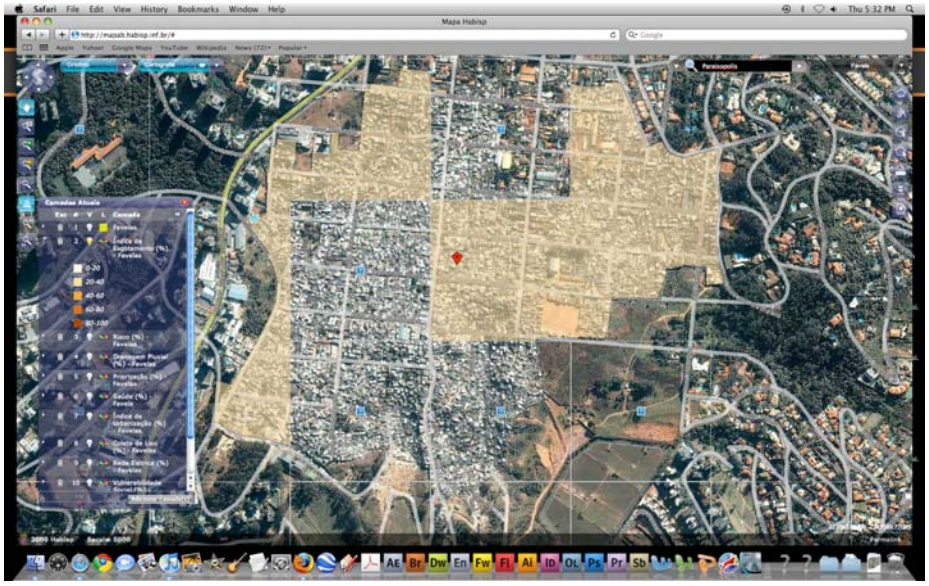

Illustration 22: Paraísopolis - Sewer Coverage

APPENDIX E: HELÍOPOLIS MAPS

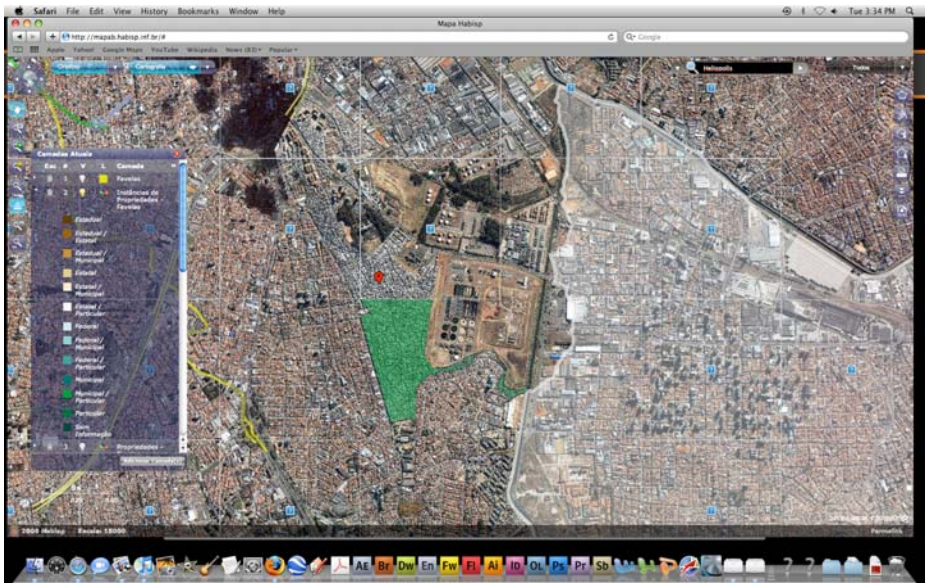

Illustration 23: Helíopolis – Type of Favela properties

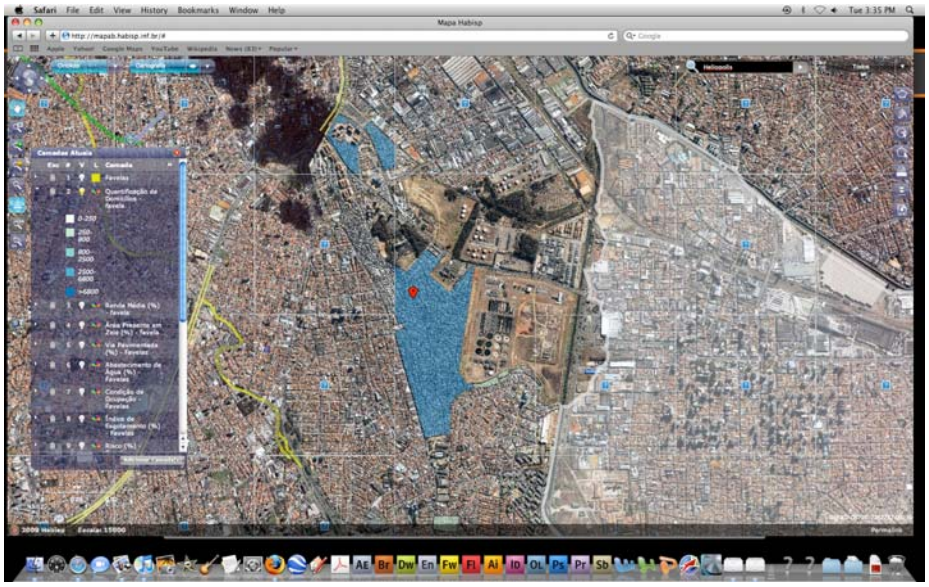

Illustration 24: Helíopolis - Number of households

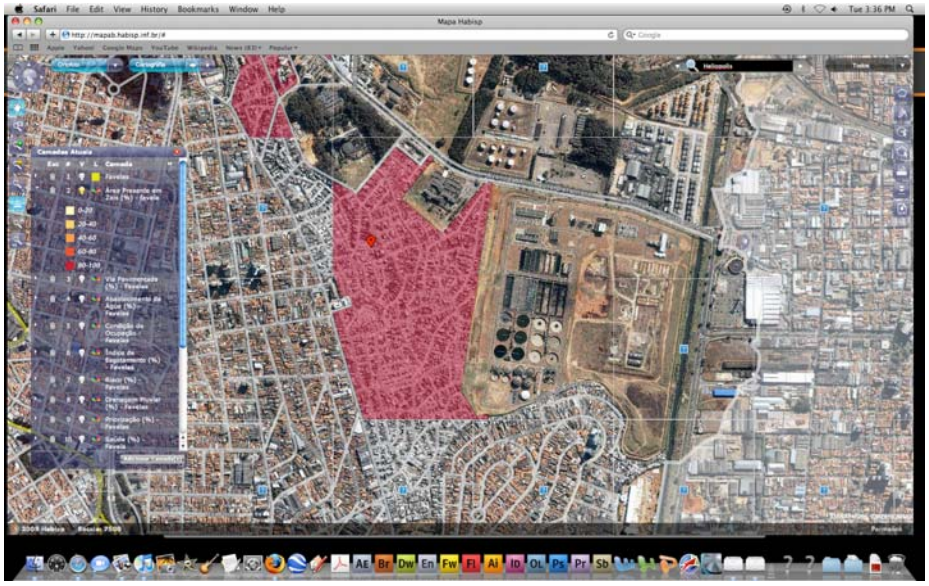

Illustration 25: Helíopolis - Area in ZEIS

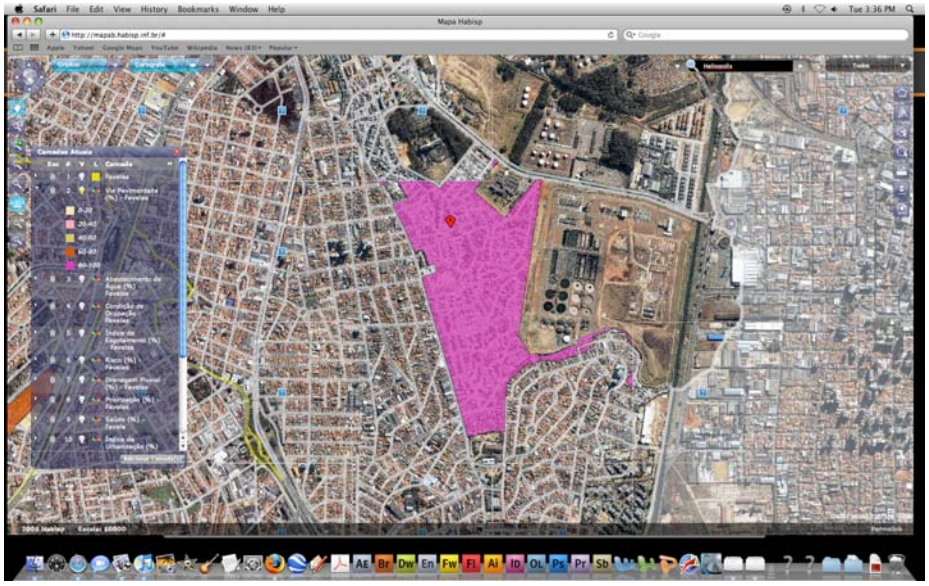

Illustration 26: Helíopolis - Percentage of Paved Roads

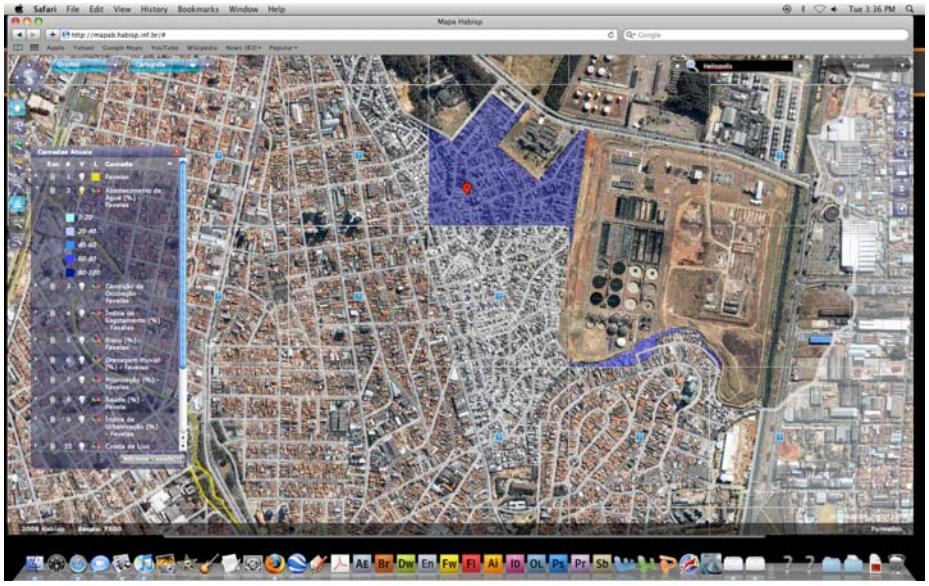

Illustration 27: Helíopolis – Households with Water Supply

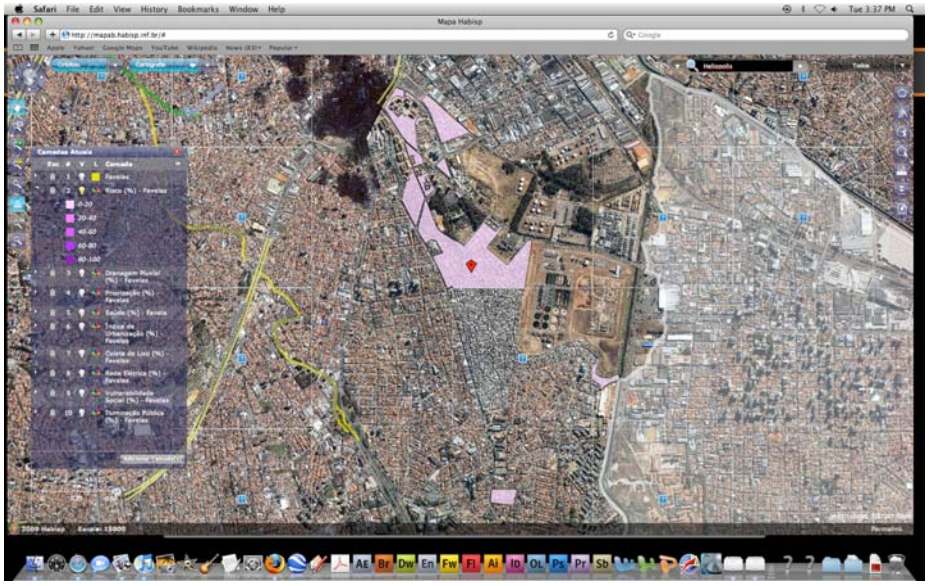

Illustration 28: Helíopolis – Risk Index

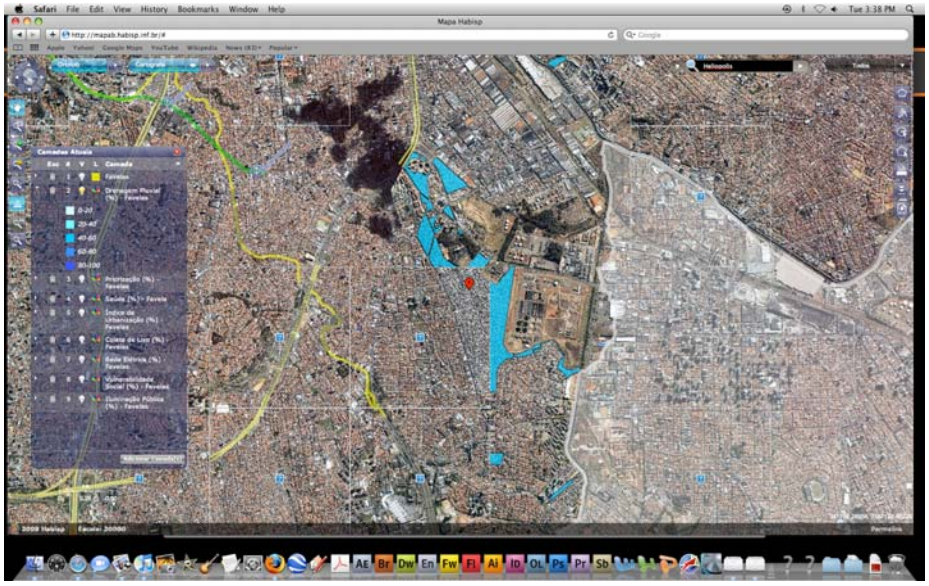

Illustration 29: Helíopolis - Storm Drain Coverage

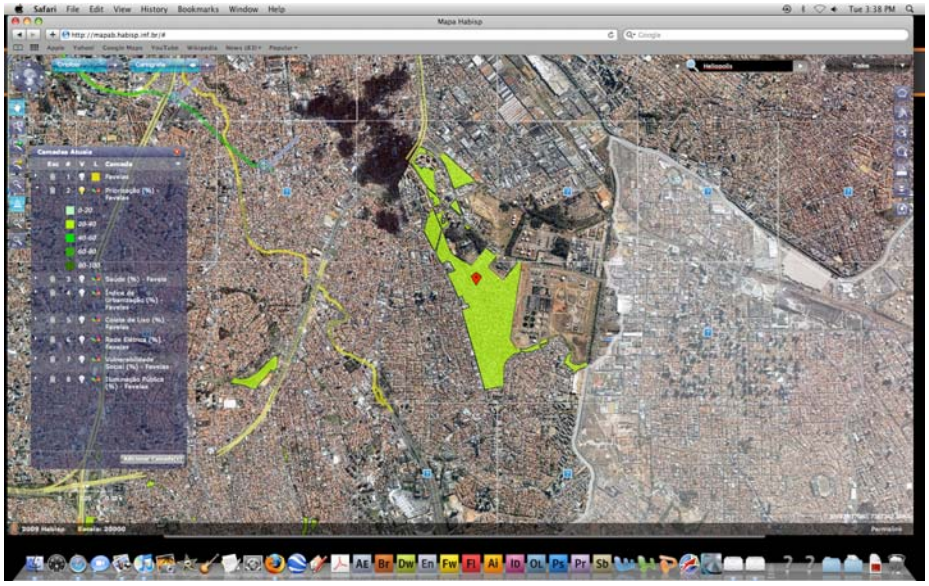

Illustration 30: Helíopolis - Prioritization Index

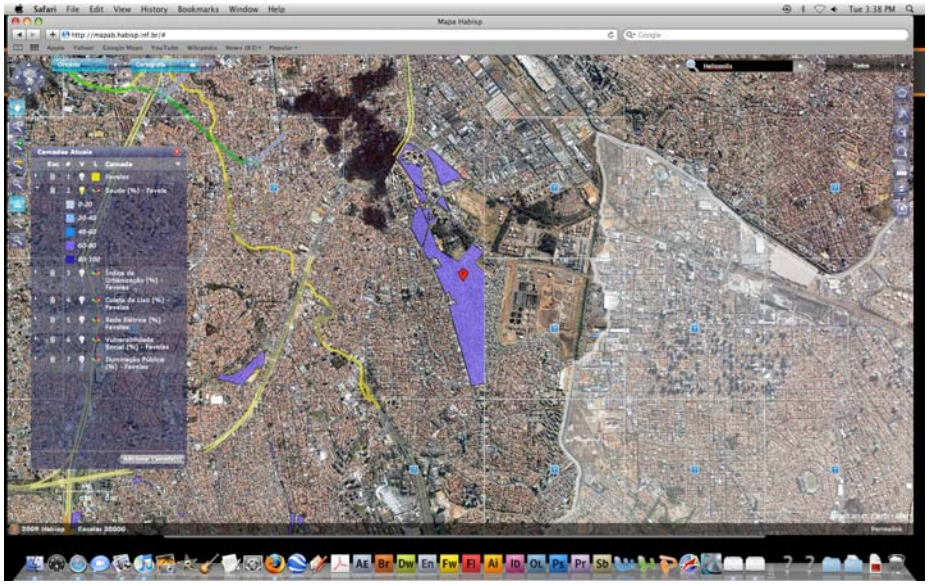

Illustration 31: Helíopolis - Health Index

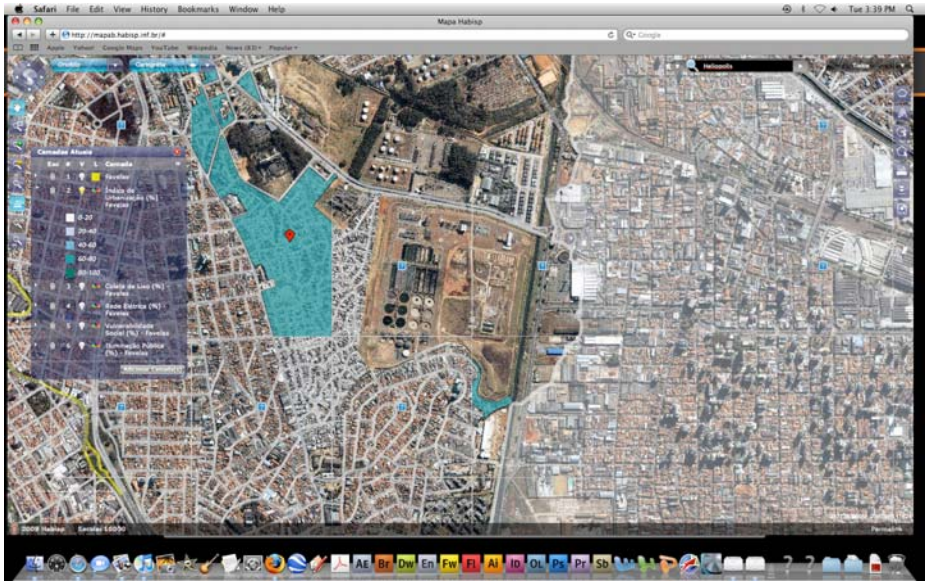

Illustration 32: Helíopolis - Urbanization Index

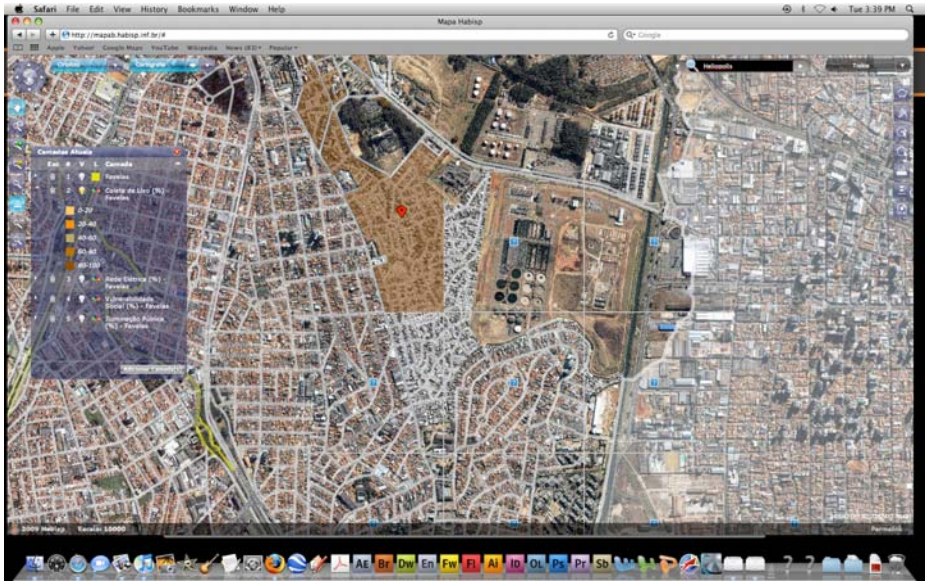

Illustration 33: Helíopolis – Households with Trash Services

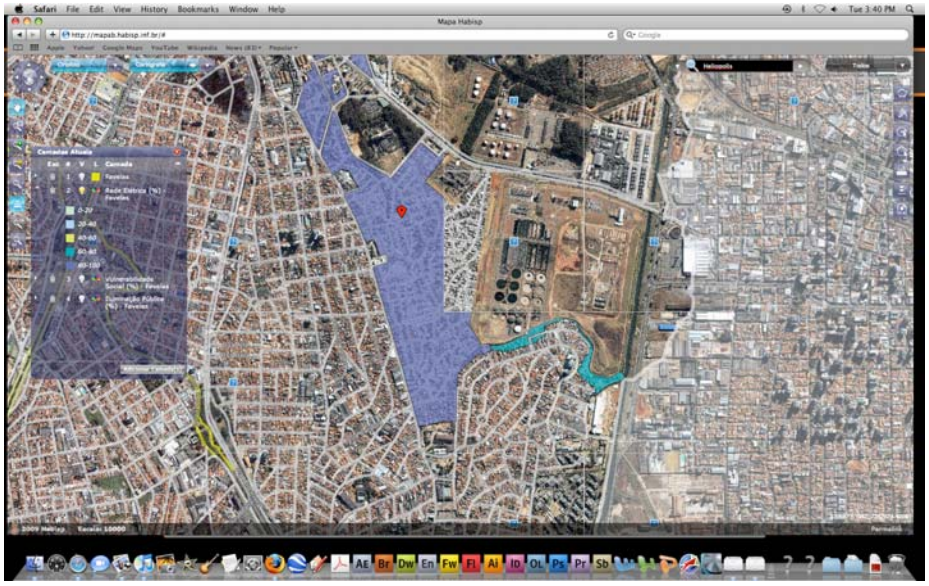

Illustration 34: Helíopolis – Households with Electricity

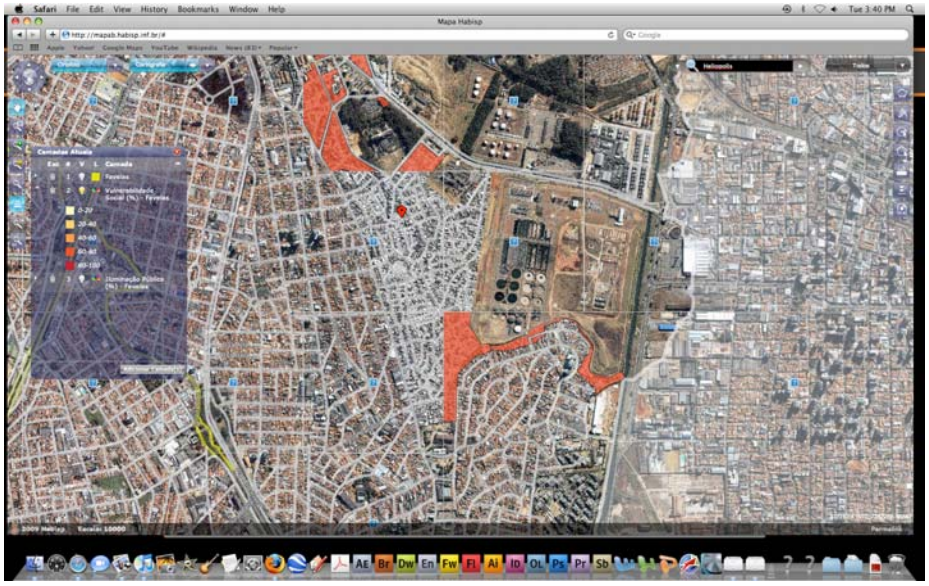

Illustration 35: Helíopolis – Social Vulnerability Index

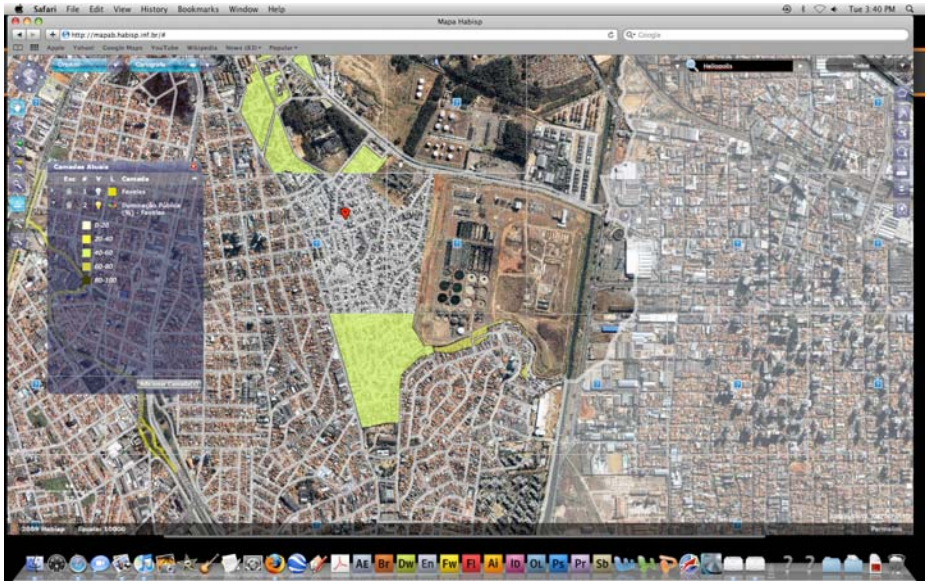

Illustration 36: Helíopolis - Public Lighting System

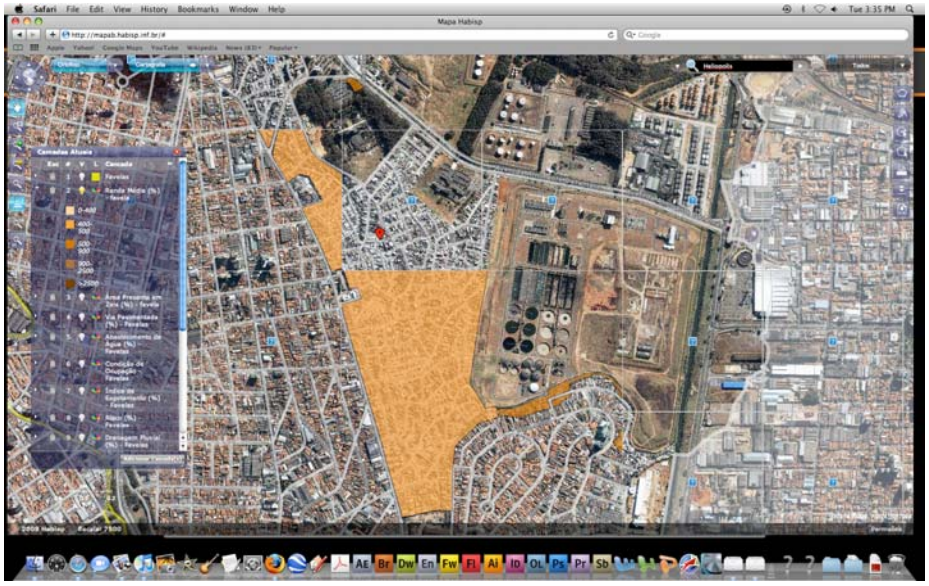

Illustration 37: Helíopolis - Median Income

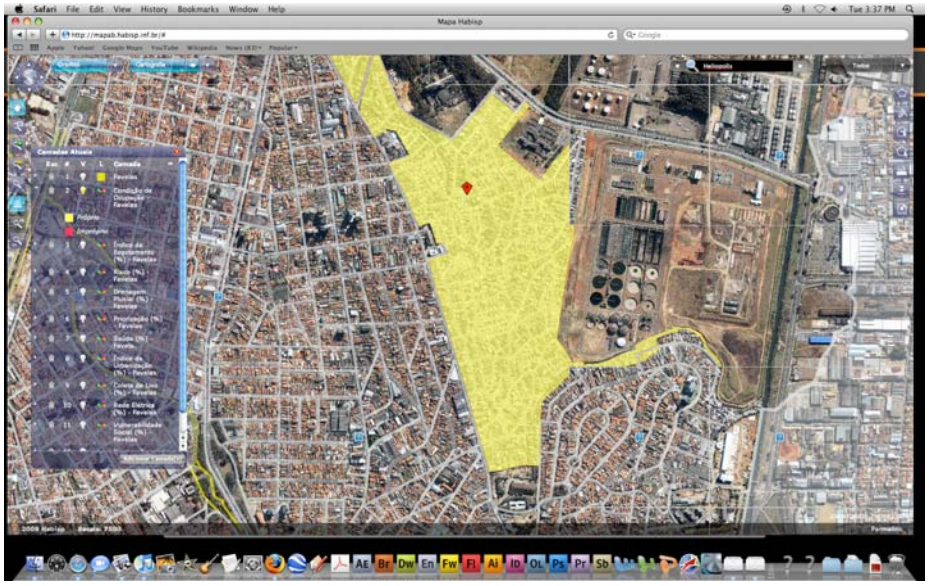

Illustration 38: Helíopolis - Occupation Conditions

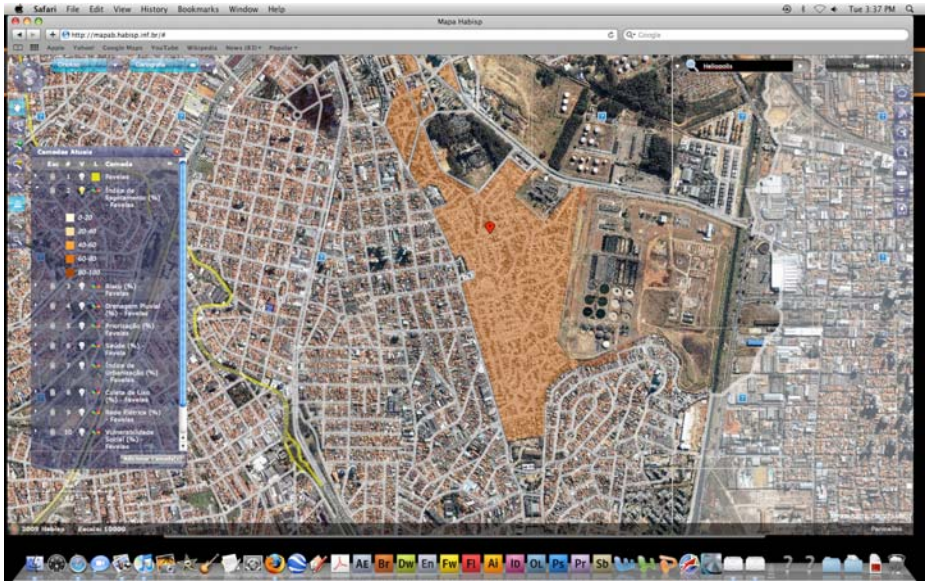

Illustration 39: Helíopolis - Sewer Coverage

APPENDIX F: SABESP MAPS

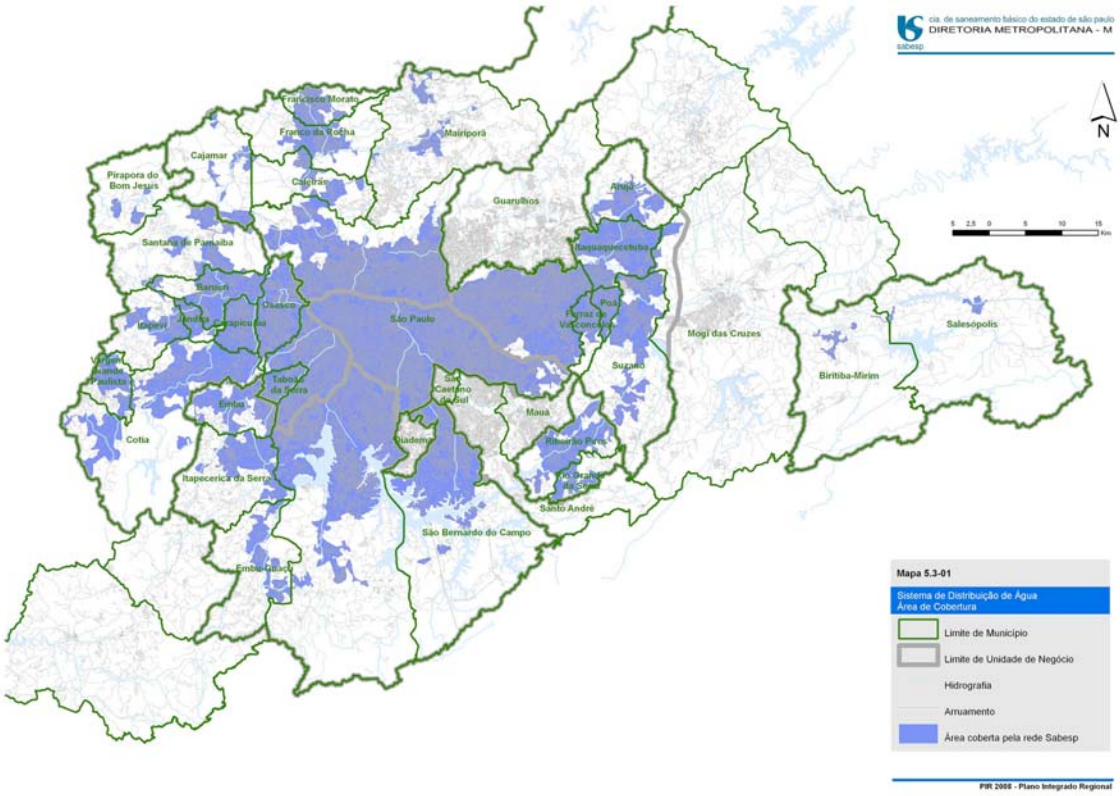

Illustration 40: Water Service System Coverage

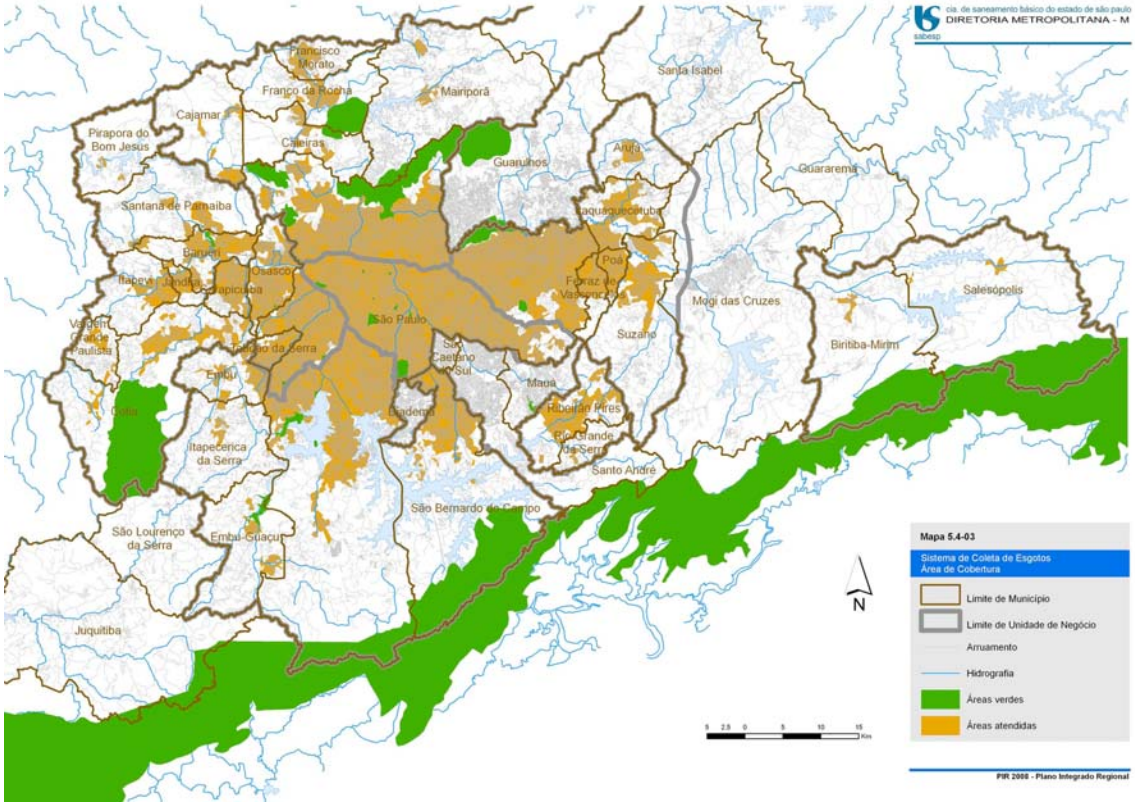

Illustration 41: Sewer System Coverage

Glossary

KEY TERMS

Informal Settlement (Favela) – Housing settlements with self-built constructions occupying public or private areas; Main features: highly precarious or nonexistent urban infrastructure and public services; population on very low incomes and experiencing problems over land/property ownership (Prefeitura de São Paulo 2008).

IPVS – The Paulistano Social Vulnerability Index

Irregular Settlement -technical occupations and legally irregular, promoted by an external agent to all residents, whose track splitting feature that allows the identification of a lot about the route of access. They are made in predominantly private land acquired by some kind of marketing and can cover all ranges of family income. The irregular allotment considered a piece of the housing policy of social interest is the one whose head of family has an average monthly income of up to six times the minimum wage (Prefeitura de São Paulo 2008).

Reconfiguration – the act of redesigning the informal settlement in such a way to accommodate the urbanization process and to address the concerns of watersheds and environmental hazards.

Resettlement – the act after the reconfiguration process to place families in other areas of the informal settlement who have agreed to the resettlement process. These families have also been involved in the discussion and decision-making process of the reconfiguration of the informal settlement.

Public Ownership – the land title under the ownership of a federal, state or municipality agency.

Private Ownership – the land title under the ownership of a private individual, entity or company.

Tenure Regularization – process through which irregularly occupied areas become part of the formal context of the city in its urban planning, legal and administrative: urban planning, legal dimension, and administrative.

Social Tariff – the city or public services agency providing public services at lower costs dependent on household income levels

Water Infrastructure - the delivery and management of water through a system of pipes, storage tanks, reservoirs and water distribution points.

FEDERAL, STATE AND CITY AGENCIES

CAIXA – Federal Economic Bank

CDHU – State Housing and Urban Development Company

CEH – State Housing Counsel State Plan of Housing

CET – City Traffic Engineering Department

Cities Alliance – a non-governmental organization

CMH – Municipal Council of Housing

COHAB – Metropolitan Housing Company

FMH – Municipal Housing Fund

HABI – Superintendent of Low-Income Housing

IBGE – Brazilian Institute of Geography and Statistics

PMH – Municipal Plan of Housing

PMSP – Municipality of Sao Paulo

RESOLO – City Subdivision Regularization Department

RMSP – Metropolitan Region of Sao Paulo

SABESP – São Paulo Water and Sewer Company

SEADE – São Paulo State Foundation of the System of Data Analysis

SEHAB - Municipal Housing Secretariat

SEMA – State Secretary of the Environment

SEMPLA – Municipal Secretary of Planning of Sao Paulo

SNHIS – National System of Social Interest Housing

SMADS – Municipal Assistance and Development Secretary

SMPP – Municipal Secretary of Participation and Partnership

SMSP - Municipal Secretary of Sub-districts

SMTrab – Municipal Secretary of working

SVMA – Municipal Secretary of Green and the Environment

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