

2 ANALYSIS OF URBAN ISSUES IN DAKAR

2.1 Dakar Metropolitan Area¹

(1) Geographical Characteristics

The Dakar metropolitan area covers an area of approximately 200 square kilometers. The area is located at the western end of the African Continent facing the Atlantic Ocean to the west, north and to the south. The entire the metropolitan area is the subject of this study as stated in Section 1.2.2.

The area's climate is characterized by a dry season (November to June) and a rainy season (July to October). The annual average rainfall between the years 1947 and 1972 was 458 mm and between 1970 and 1992 was 328 mm.

(2) Socio-Economic Characteristics

The Dakar metropolitan area generates 70 percent of Senegal's GDP. Major industries including manufacturing, fishery, commerce, transport, as well as governmental administration are concentrated in this area. Despite this, 40 percent of the area's employment is considered to be in the informal sector.

The population of the Dakar metropolitan area is estimated at 1.9 million. Therefore, the average population density of the whole Dakar metropolitan area is about 95 persons per square kilometer. The annual average growth rate between 1994 and 1995 is estimated at 3.8 percent by the Department of Forecast and Statistics (DPS) for the Dakar metropolitan area. However, the growth rate of Pikine-Guediaway during the same period is estimated to be much higher at 5.2 percent.

(3) Living Conditions

The average family size in Dakar is 7.8 persons. Almost half of the total households in Dakar live in their own houses and the rest live in rent housing. The average price of housing is 3.0 times the average annual income, and the average house rent is 19 percent of income. The average commuting time in 1993 was 63 minutes. Only 33 percent of the total houses in the Dakar metropolitan area are legally constructed. Residents of many so-called "spontaneous settlements" have to bear substandard living conditions.

¹ The source of information in this section is National Habitat II Committee, *Human Settlement Management in Senegal*, May 1996, and ADM, *Urban Audit Report of Guediawaye City*, April 1999.

2.2 Urbanization in Dakar

The provision of urban infrastructure and construction of buildings in Dakar started in an area overlooking the port in the middle of the 19th century. Since then, the city first filled up the tip of the peninsula and has gradually expanded eastward filling the body of the peninsula along the way. This eastward expansion is clearly shown in the boundaries of successive urban master plans as shown in Figure 2.2.1 and Figure 2.2.2.

At present, the main concern in Dakar, as in many African cities, is not only the size of the city itself but also its rate of growth. The rapid sprawling of Dakar has caused shortages in housing, public facilities, and amenities. Approximately 30 percent of the surface area of Dakar is covered by irregular settlements in one form or another.

(1) Urban Planning Master Plan (PDU)

Urban plans for Dakar have been set out many times in the past. For example, Urban Planning Master plans (PDUs) have been prepared since colonial times, and include:

- 1 The PDU of 1862, which covered a small area behind the port;
- 2 The extension plan of Dakar of 1901, which covered an area of 7 square kilometers;
- 3 The PDU of 1914-15 created Medina;
- 4 The PDU of the 1940s (target year 1951), which covered the peninsula up to Camberene;
- 5 The modified plan of 1957 which covered the peninsula up to the Mbao forest;
- 6 The PDU of 1967 which went beyond organizing port, industrial, commercial facilities and the Plateau area, and dealt with the extension of the urban area;
- 7 The PDU of 1980s (target year 2001) which favored a settlement area for future extensions with the creation of new housing areas and the development of existing areas;
- 8 The PDU by 2025: an invitation of tender for its drafting has already been issued and a consultant awarded the contract. This PDU is intended to supercede the existing one, which has become outdated.

(2) Urban Development Strategy

A strategy for development of the metropolitan area has been supported lately by an urban planning and housing policy focusing on the following:

- 1 Preparation of frame work of urban planning by DUA and municipalities by means of the Urban Planning Master Plan (PDU) for long term, the Urban Planning Reference Plan (PUR) for short term, and the Detailed Urban Development Plan (PUD) for the execution and management;
- 2 Construction of housing units by housing development companies both public and quasi-private companies including Cap-Vert Real Estate company (SICAP), National Moderate Rent Housing company (SNHLM), and Modern Housing Company (HAMO);
- 3 Development of extension areas (areas outside existing built-up areas) with basic infrastructure in order to produce housing lots for individual construction (Parcelles Assainies) by SNHLM under the supervision of the Ministry of Urban Planing and Housing (MUH);
- 4 Restructuring and regularization of spontaneous settlements through the joint effort of DUA, municipalities, communities and donors²;
- 5 Creation of mixed housing development zones (ZAC) of Mbao by DUA and municipalities; and
- 6 Establishment of the Senegalese Housing Development Bank (BHS), which reinforced the organizations set up by the Government to support the building of social housing units including cooperative housing.

Given the large discrepancy between Dakar and the countryside, and consequent influx of migrants to the metropolitan area, the urban problems of Dakar can not be solved solely by Dakar itself. A nationwide policy is additionally required.

Still, the IIMS can be an important tool for assisting decision making. It provides comprehensive and readily retrievable data in a high quality presentation format and incorporates scoring criteria for evaluating urban facilities and thus helping to establish planning priorities. It should enable the government to:

- provide plans ensuring better access to existing socio-economic infrastructure according to population distribution in the metropolitan area;
- identify deficiencies in infrastructure in each area so that remedial actions can be taken; and
- provide agencies related to urban activities with high quality and readily usable data to increase their efficiency.

² Spontaneous settlements typically do not have orderly structured roads or alleys and are not registered with legal rights. Government agencies and donors attempt to restructure site plans and provide legal rights to allow

2.3 Urban Development Issues

As urban development in Dakar makes rapid progress, the IIMS should be a useful instrument for decision making among concerned parties. In order to ensure optimum use and application of the IIMS for Dakar's particular urban environment, an understanding of its urban problems and the structure and responsibilities of concerned agencies were initially required. Field surveys were thus carried out at an early stage in the study to establish priority issues from which diagnostic urban cartes were produced. Chapter 5 describes the conception of the IIMS from this initial work.

2.3.1 Field Surveys

A field survey was carried out to identify the urban problems of the Dakar Metropolitan Area. The survey was performed through a combination of site visits and interviews. To obtain first-hand information on the urban situation in the Study Area, the Study Team collected the views of residents, rather than solely relying only on those of public administrators and city planners.

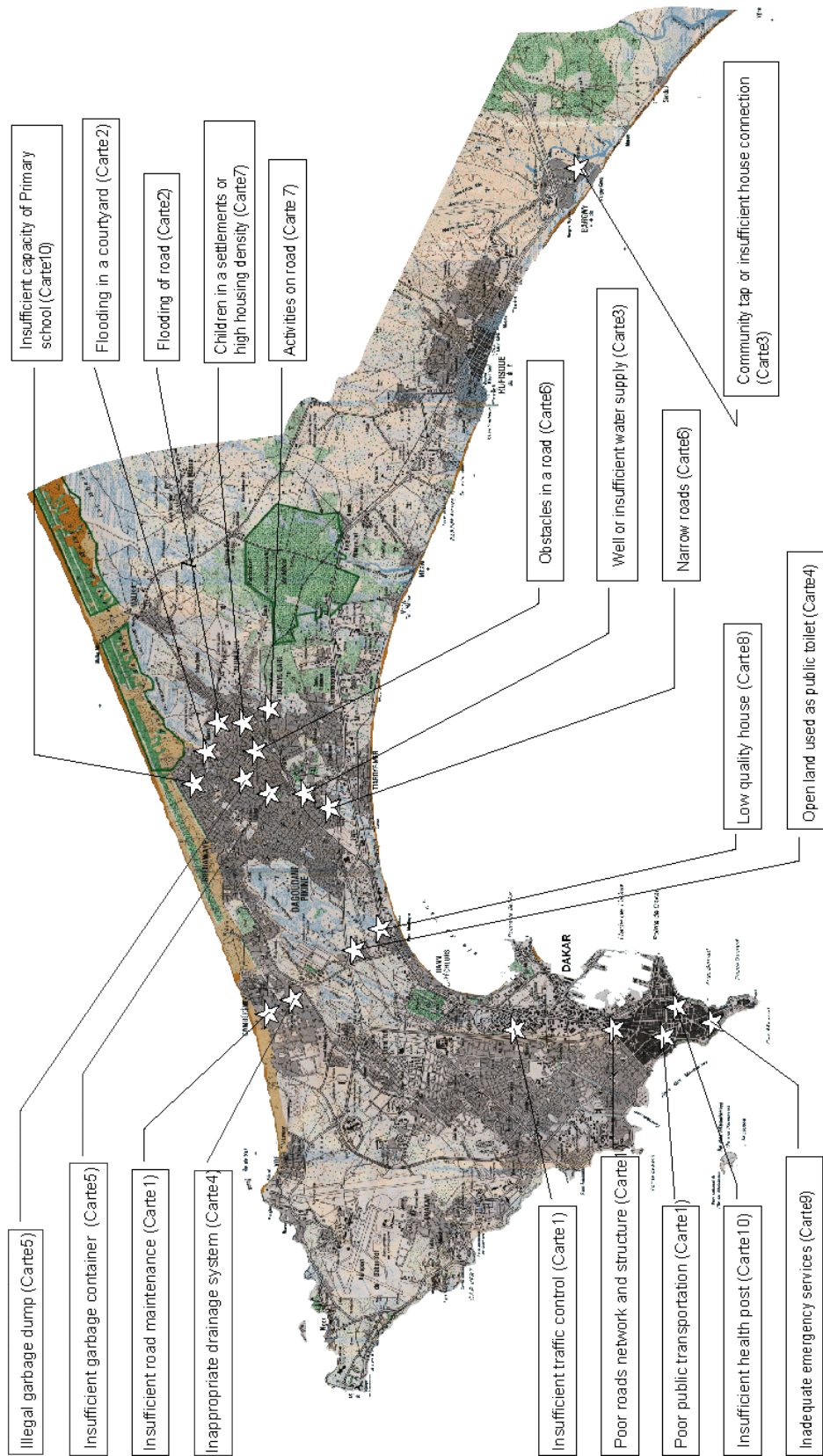
By means of site surveys and interviews, many urban problems were identified. Of these, ten were selected as most important by a joint effort of DTGC, DUA, and the Study Team during a series of workshops held for this purpose. The selection was made considering the severity and urgency of each of the problems. Some problem sites were photographed and are shown as parts of the urban *Carte* later in this chapter.

Figure 2.3.1 shows locations of examples of the urban problems identified by the field survey. Each location corresponds to the photograph attached to the urban *Carte*. Only the most prominent locations are shown in the map. There are many other locations with similar problems in the Study area.

such settlements to be brought into the normal regulatory regime.

Figure 2.3.1 Example Locations of Urban Problems

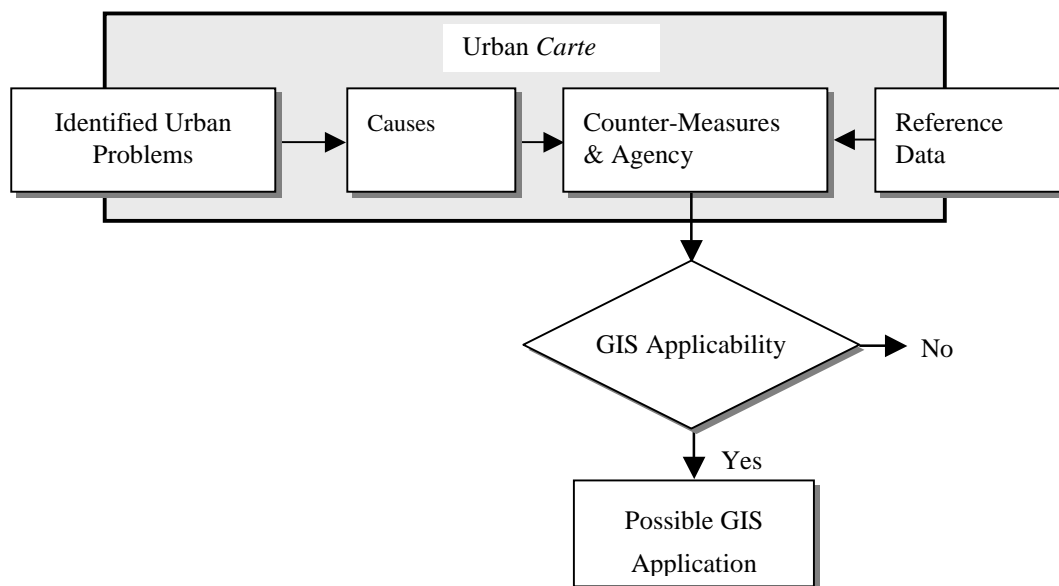
☆ Star marks show the location where urban problems or issues are observed



2.3.2 Carte of Urban Problems

The logical framework of an urban carte is illustrated in Figure 2.3.2. The way in which this framework fits into the overall concept for IIMS is summarized later in Chapter 5. The carte is the initial stage in designing an appropriate GIS system. Once the carte of problems is established and the institutional framework understood, work can then proceed on designing the system that best matches the characteristics of Dakar’s urban environment.

Figure 2.3.2 Conceptual Framework for Urban *Carte*



Source: JICA Study Team

Each of the ten major urban issues identified in the Study Area was thus carefully studied to clarify its direct causes, possible counter-measures, responsible agencies, and data required to further analyze the problem.

A diagnostic *Carte* of urban problems consists of seven parts;

- 1 “Phenomenon” or title of the urban *Carte* consists of a brief description of each problem;
- 2 “Consequences” are the undesirable effects of the problem;
- 3 “Situation” is a short explanation of the problem, followed by some photographs with captions;
- 4 “Causes”, in the first column of the table, is a list of factors that make the problem happen;
- 5 “Relevant Agencies”, in the second column of the table, is a list of agencies that are relevant to the “Cause”.

- 6 “Counter-Measures”, in the third column of the table, is a list of possible operations which may rectify the “Cause”; and
- 7 “Reference Data”, in the last column of the table, is a list of data which is required for implementation and monitoring of the counter-measures.

Through the field surveys and discussions with Senegalese counterparts, the following are the 10 main urban problems identified:

1	Slow traffic and long commuting time	<i>Carte 1</i>
2	Frequent and prolonged flooding	<i>Carte 2</i>
3	Inadequate water supply	<i>Carte 3</i>
4	Lack of treatment of waste water and sewage	<i>Carte 4</i>
5	Poor garbage collection	<i>Carte 5</i>
6	Poor accessibility to houses	<i>Carte 6</i>
7	High housing density with few open spaces	<i>Carte 7</i>
8	Poor housing quality	<i>Carte 8</i>
9	Inadequate emergency services	<i>Carte 9</i>
10	Poor public facilities	<i>Carte 10</i>

The diagnostic urban *Cartes* are shown in the following pages.

Urban Carte 1

Phenomenon:
Slow Traffic or Long Commuting Time

Consequences
Inefficiency in economy
Inefficiency in emergency services

Air pollution
Inefficiency in garbage collection

Situation

Traffic problem is one of the most serious concerns of the metropolitan population. The road network is inadequate for the population of two million. In the Dakar region, major employment and large facilities, such as university and hospital, are concentrated in the city of Dakar with residential areas sprawling wide and far, which forces people to commute long distances.



Insufficient road maintenance
Potholes in roads are rarely repaired, and there is prolonged flooding.



Poor road network and structure
The road network does not meet social needs. Increasing numbers of cars and trucks are squeezed into the limited road network.



Insufficient traffic control
At intersections in the Study Area, traffic congestion is common at any time of day.



Poor public transportation
Bus terminals are constantly full of waiting passengers. Public transportation is not sufficient for the total person trip demand in the Metropolitan Area.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Limited road maintenance	DTP-METT	Implementation of road maintenance	Location of damaged road
	Municipality	Implementation of road maintenance	Location of damaged road
(2) Poor road network and structure	DTP-METT	Improve the road network	Location of present and planned network
	Municipality	Improve the intersection structures	Number of lanes of each intersection
(3) Insufficient traffic control	Police	Maintenance & operation of traffic lights	Location of traffic lights
		Improvement of manual traffic control	Locations of major intersections
(4) Poor Public Transportation	DTT-METT	Guidance of private bus service - Specify the bus stop locations - Maintenance of bus - License management	Location of stops with number of users
		Bus Companies	Improvement of public bus service Bus route with service capacity
(5) Illegal roadside occupation by shops	Municipality	Market construction to relocate them	Location of illegal occupation
(6) Obstructive car parking	Police	Guidance and construction of car parking	Location of frequent obstructive car parking
(7) Concentration of employment and facilities in Dakar City	ARD	Appropriate development plan	Present land use
	Ministry of Industry	Development of industrial parks in suburbs	Open land with appropriate utilities
	MUH	Preferable zoning for suburban areas	Distribution of business & industrial area
	All the relevant organizations	Appropriate facility placement	Distribution of major public facilities
(8) Flooding	DTP-METT	Construction of road drainage system	Location of flooding in road network
	Municipality	Construction of road drainage system	Location of flooding in road network

Urban Carte 2

Phenomenon:
Frequent and Prolonged Flooding

Consequences
Insanitation, smell, insects
Inconvenience in daily activities
Risk of epidemic

Damage to properties
Slow Traffic

Situation

Dakar metropolitan area is located on low land. Some parts of the area are in a depression called niaye, which was used for farm land. However, in the last two decades, houses have sprawled into the niaye. Even though the rainy season lasting for three months (July, August, September), inundation in many neighborhood persists for months.



Flooding in a courtyard

This courtyard is used as kitchen of this house. Once inundated, daily life is seriously disturbed.



Flooding of road

This is one of the main roads of this district. During the flooding, few cars can use this road. Flood water is polluted with garbage and leakage from septic tanks, which breeds mosquitoes, small insects, and disease.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Low land with little natural drainage (Natural or Physical reason)	Government	Relocation	Land of low height and little slope, soil type Distribution of flooded areas
(2) Poor drainage system (Technical reason)	ONAS	Construction of Drainage system	Land of low height and little slope Distribution of flooded areas Condition of existing drainage
	DTP-METT	Maintenance of road drainage system	Condition of road drainage
	DTP-METT, Municipality	Construction of road drainage system	Distribution of flooded areas, road network
(3) Spontaneous settlements	DUA-MUH, Municipality	Relocation of squatters (as Dalifort)	Flooded areas with population

Urban Carte 3

Phenomenon:
Inappropriate Water Supply

Consequences Frequent piped water cut (water comes only a few hours a day)
Water fetching labor of women and children (from community tap or well)
Insufficient water consumption--risk of disease
High cost of water from water vendors Use of polluted well water

Situation

Water supply has been a big problem for years in the Dakar region. Even after the establishment of SDE (private water company), many problems been left unattended. Many residents do not think piped water is affordable due to a high initial fee (97,000FCFA) for the house connection, and therefore keep their houses unconnected. Their main water sources are community taps and wells. Water vendors still maintain business in this metropolitan area.



Community fountains

After the privatization of the water supply company, water from community taps is also charged.
For a big bucketful of water, the fee is 25 F CFA.



Wells

Water from wells is not for drinking, but for washing and bathing. However, fetching water is a big burden for women and children.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Low water pressure	SONES, SDE	Improvement of Facilities	Area of frequent water cut
		Increase water resource	Water volume per person of each area
		Prevent water pipe leakage	Leakage ratio of each system branch
No house water connection because of:			
(2) Community fountain	SDE	No charge for house connection (now 96,000 FCFA)	Location of fountains
		Rising of water price from fountains	Water consumption of each fountain
		Progressive charge system for low-income family	Water consumption and charge of each area
	Municipality, SDE	Welfare for poverty families in case of default	Unemployment rate of each area
(3) No water network	SONES, SDE	Extension of water supply network	Existing water supply network
		Construction of community taps	Location of community taps
	DUA-MUH	Relocation of people living outside of the network	Area of no network with population

Urban Carte 4

Phenomenon:
Insufficient Treatment of Waste Water and Sewage

Consequences
Insanitary condition
Bad smell
Water pollution

Risk of epidemic disease
Breeding of Mosquitoes

Situation

Basically, sewerage and waste water from kitchens and showers are kept in waste water pits, which have no effective treatment function. The overflow of the tanks smells badly. Very few drainage systems are found in ordinary settlements. When inundation occurs in settlements, flooded water overflows from the waste water pits and causes an insanitary situation. This surface water inevitably pollutes the well water, which is still used mainly for washing and showering.



Public toilets

Many houses built in spontaneous settlements have no toilet. This picture shows a humble enclosure for a urinal. The building behind is a paid public toilet.



Road side gutters

Waste water is disposed into this road side gutter from many houses. However, the end of the gutter is a large water pool on a road.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Insufficient sewage disposition	ONAS, Developers	Construction of sewage	Location of sewage
(2) No connection of sewage to house	ONAS	Free connection charge	Location of sewage with connection ratio
(3) Insufficient maintenance of sewage	ONAS	Good maintenance of sewage	Location of sewage with maintenance records
(4) Direct sewer disposal into open drainage	MS	Guidance to construct septic tank	Location of open drainage
(5) Poor quality of waste water pits	DUA-MUH	Guidance with appropriate standard	Estimation of waste water volume
(6) No toilet in house	DUA-MUH	Enforcement of building permission	% of barracks in each settlements
(7) Flooding - (see the 2. Flooding)			

Urban Carte 5

Phenomenon:
 Poor Garbage Collection

Consequences

- Poor accessibility to garbage containers
- Garbage containers are always full and their sites are insanitary
- Discourages the sense of a clean neighborhood --- garbage on streets
- Choking of drainage with garbage
- Breeding of flies

Situation

It is estimated that one person generates 500g of garbage every day; that means as much as 1,000 tons of garbage for the population of two million. Private companies are undertaking the disposal job with 60 garbage trucks. Slow traffic, narrow and irregular road patterns, and bad road conditions to the dumping site are all negative factors that prevent an efficient garbage collection.



Garbage containers

Only 10 trucks with a container crane are in operation for 1,000 garbage containers. As a result, containers are almost always full and the site becomes insanitary.



Illegal garbage dump

Generally speaking, neighborhoods are kept clean. However, exceptions can be easily found. Some of the abandoned parcels in flooded areas are filled with garbage.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Limited frequency of garbage collection	Neighborhood, Commune d'Arrondissement	Raise fund and contract with garbage management company	Area of special contract
	Municipalities	Improve the roads to dumping sites	Location of road damage
(2) Poor road network and few open space	DUA-MUH	Road construction in irregular settlements	Location of containers and road network
	DUA-MUH	Land readjustment with road construction	Area of spontaneous settlements

Urban Carte 6

Phenomenon:

Poor Accessibility to Houses (Narrow and irregular roads)

Consequences

No access by ambulance

No access by garbage truck

Poor access to public services

Situation

Rapid population growth since the 80's did not allow migrants to choose or plan their settlements carefully. They often get a small piece of land from a "land owner" who has no registered ownership, and build their house with little coordination with their neighbors. Once the area is built-up, inconvenience becomes obvious. They cannot get any kind of vehicle based services such as postal and goods delivery, garbage collection, public transportation, ambulance, police car, fire engine, and so on.



Narrow roads

Spontaneous settlements were made without any expectation of vehicular services. Any stranger who enters this neighborhood can easily become lost.



Obstacles in a road

This road is a theatrical stage of daily life. It is the place where friends meet, the elders nap, children play, shops open, sheep rest, and cars occasionally go by.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) No plan or guidance of road network (existing spontaneous settlements)	DUA-MUH Municipality	Land readjustment Widening roads	Location of spontaneous settlements Distribution of narrow roads
(2) No plan or guidance of road network (Potential area of future sprawl)	DUA-MUH	Road plan for the area to be built up Planned housing development	Potential area of future sprawl Sprawling area
(3) No incentive to get land ownership	DID-MEFP	Tax incentive for legal land acquisition	Distribution of land ownership
(4) Little enforcement for building permission	DUA-MUH, Municipalities	Tax incentive for legal houses	Distribution of legal houses

Urban Carte 7

Phenomenon:
High Housing Density with Few Open Spaces

Consequences Insufficient privacy
No space to mitigate smell, noise,
Risk of fire disaster

Pollution of well water
No space for public facilities

Situation

The household size in Dakar region is said to be 8-10 persons. And often more than two households are accommodated in one house. Therefore 13 persons is a rule of thumb for an estimation of the number of persons in one house. If the housing density is 60 per hectare in a settlement, population density is $60 \times 13 = 780$ person/ha. This is a very high density for a one storied area.



Children in a settlement

Statistics say a Senegalese woman gives birth to 6.7 children in her life. Every settlement is thus full of children



Activities on road

Because of the limited space in housing lots, many activities are done on the roads; cooking, napping, washing cloth, and even butchering cows and sheep.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) No plan for parcel size in existing spontaneous settlements	DUA-MUH	Land readjustment of spontaneous settlement	Distribution of population density
	DID-MEFP	Cooperation to the land readjustment	Distribution of state-owned land
(2) No planning for parcel size and disposition (in sprawling area)	DUA-MUH	Specification of prospective road locations	Location of prospective roads
	DID-MEFP	Specification of prospective road locations	Potential area of urban sprawl
	DUA-MUH	Coordination of planned housing development	Cost estimation of utilities
(3) Needs of job opportunity (necessity to live close to Dakar)	DUA-MUH	Land readjustment of spontaneous settlement	Distribution of population density
	DID-MEFP	Cooperation to the land readjustment	Distribution of state-owned land

Urban Carte 8

Phenomenon:
Poor Housing Quality

Consequences
Leakage of rain water
Intrusion of sand, insects

Risk of fire disaster
Little function against cold weather

Situation

Huts are classified into two categories. A whole hut is a shanty with both walls and roof made of temporary materials. On the other hand, a partial hut is a house only with roof made of temporary materials. Huts are not only the symbol of poverty, but also they are often the indicator of unregistered land occupation, or squatting.



A hut

Huts are made of the cheapest materials such as recycled metal plates. In many cases, illegal status of land ownership discourages the house owner to invest more for his accommodation.



Interior of a hut

No floor, no air tightness. However, hut owner can make contract with water supply company and power supply company.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Anxiety of squatters evacuation or no motivation to invest more	DID-MEFP	Land readjustment with ownership program	Distribution of registered land
	DUA-MUH	Land readjustment with ownership program	Distribution or ratio of barracks
(2) Few financial resource	BHS	More affordable housing loan	Number of borrowers in each area
(3) No incentive or enforcement of building permission	DID-MEFP	Tax incentive for legal buildings	Number of registered parcels in each area
	DUA-MHU	Compulsion of building permission	Number of Building permission in each area
(4) No collaboration with utility company	SONES, SDE	Refusal of water supply to barracks	Location of barrack houses
	SENELEC	Refusal of power supply to barracks	Location of barrack houses
	SONATEL	Refusal of telephone connection to barracks	Location of barrack houses

Urban Carte 9

Phenomenon:
Inadequate Emergency Services
 (Police, Fire fighting, Ambulance)

Consequences Social insecurity
 Serious damage by fire disaster
 Insufficient treatment for the injured or the sick

Situation

Because of the explosive population increase in the Dakar metropolitan area together with the very limited budget of public administration, the emergency service systems are not sufficient to serve the two million people in the area.



Police administration

Municipal police system started just 4 years ago. The scale of the administration is far smaller than it should be.



An ambulance at work

Traffic jam and poor accessibility to houses disturb efficient ambulance activities.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Limited police administration	Municipalities	Appropriate location of facilities	Location of police facilities
	Police	Improvement of work force	Population per police officer of each area
(2) Limited fire fighting administration	Fire brigade	Construction of emergency stations	Location of fire stations
		Improvement of fire equipment	Population per fire engine of each area
(3) Limited ambulance administration	Ambulance	Improvement of ambulance equipment	Population per ambulance of each area
	Hospitals	Improvement of ambulance equipment	Population per ambulance of each area
	Health centers	Improvement of ambulance equipment	Population per ambulance of each area
(4) Slow traffic and Accessibility to Houses see "Slow Traffic (Carte 1)" and "Accessibility to Houses (Carte 6)"			

Urban Carte 10

Phenomenon:
Poor Public Facilities
 (such as Education, Health, Recreation, and Culture)

Consequences
 Low educational attainment and literacy
 Reproduction of poverty
 Little chance to refresh

Poor public health
 High infant mortality rate
 Low life expectancy

Situation

The basic public facilities such as primary schools and health posts are big concerns of the local population. Beside insufficient absolute number of the facilities, partial distribution of them is a serious issue. Residents of spontaneous settlements have much worse accessibility to the public facilities than the rest of the population.



Primary school

Total capacity of the primary school is 90% of the children of school age. Some schools employ double-shift system (morning and afternoon) to cover their under capacity.



Health post

The Ministry of Health aims to build one health post for every 5000 population. The number of the existing health posts does not reach even 30% of the goal.

Causes	Relevant Agencies	Counter-measures	Reference data
(1) Insufficient administration of education	MEN	Construction of elementary schools	Distribution of elementary schools
		Employment of enough teachers	Number of students per teacher
(2) Insufficient administration of public health	MS	Construction of health centers and posts	Distribution of public health facilities
	MS	Employment of enough doctors and staff	Population per doctor or nurse
	MS	Development of public health programs	Number of program participants
(3) Insufficient sports facilities	DUA-MUH	Land readjustment and construction of facilities	Distribution of sport facilities
	Housing developers	Allocation of enough land for facilities	Area of sport facilities per person

2.4 Institutional Framework

2.4.1 Organization

Since the commencement of implementing the decentralization policy around 10 years ago, many responsibilities that were dealt with by the Ministry of Urban Planning and Housing have been transferred to local communities. At the same time, many “companies” were created from former governmental monopolies or authorities. Although they are called companies by name, their roles have not changed much as they are owned by the government.

At present, DUA is in charge of:

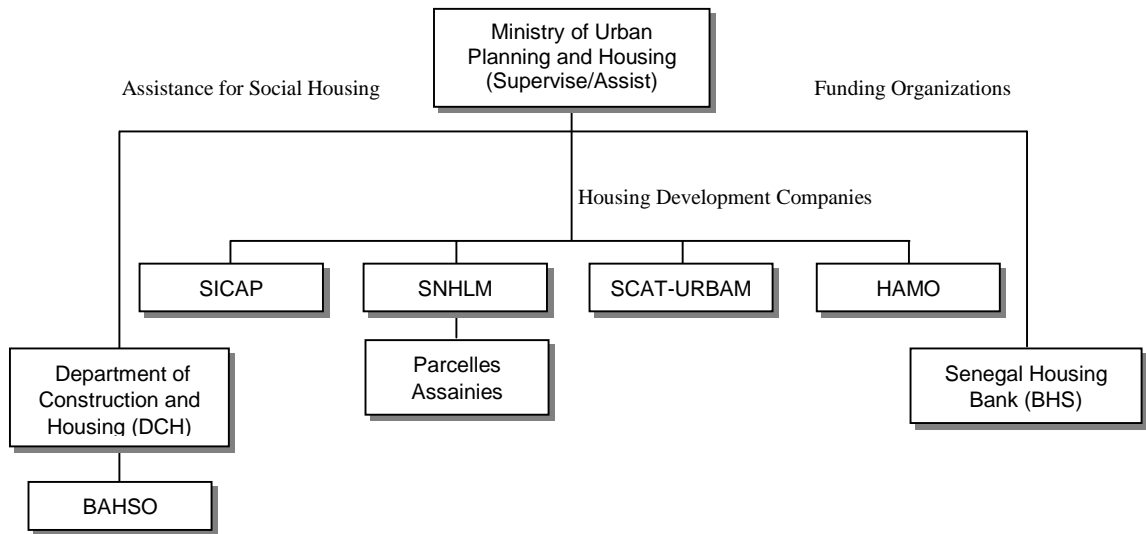
- supporting local communities in assuming those transferred responsibilities
- developing projects for the State
- executing government policy concerning urban development and architecture
- establishing regulations concerning urban development

Also during this transitional period, DUA is ensuring technical studies of applications, building authorization, plotting and modification and demolition permits. This involvement is necessary as most local communities do not have adequately skilled staff.

Aside from DUA and municipalities, many organizations are involved in the planning and provision of urban infrastructure and urban services in Dakar. Figure 2.4.1 and Figure 2.4.2 illustrate such organizations and the relationships among them.

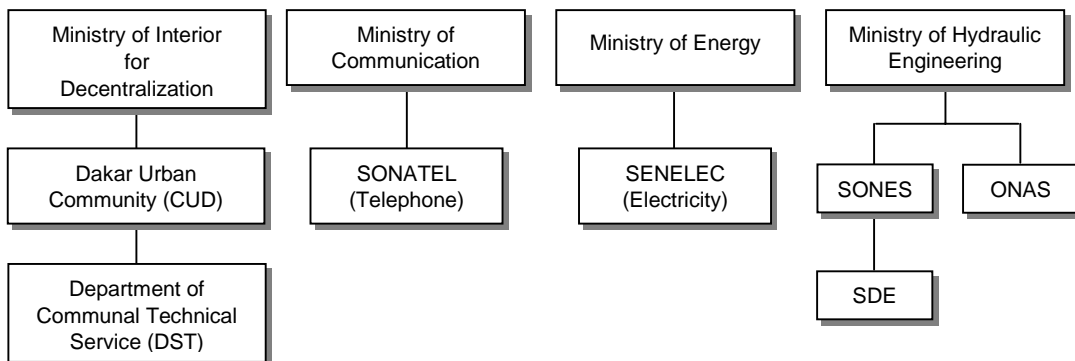
By providing high quality and readily usable data on infrastructure and population distribution, the IIMS is theoretically to be designed for the benefit of all these organizations.

Figure 2.4.1 Organizations under Ministry of Urban Planning and Housing



Source: DUA

Figure 2.4.2 Organizations Related to Utilities



Source: DUA

(1) Housing Development

In Senegal, from the early 1960s through the 1970s, housing development policy entailed planning simultaneous development of housing sites and houses, mainly by public organizations, such as SICAP, OHLM (former SNHLM), and others. This system supplied housing that was of good quality and well planned.

In 1965, 120 ha of state-owned land was given to the relocated people of Grand Dakar by the Parcelles Assainies program, which provided housing sites with streets, drainage and basic infrastructure. After the creation of BHS (Senegal Housing Bank) in 1979, this transformation became the main stream of Senegalese housing policy up to the present.

In addition to public and private companies, cooperative organizations of employees are also active in developing housing sites and houses in Dakar today.

a) SICAP: Cap-Vert Real Estate Company

SICAP, established in 1960, has provided more than 11,000 small and medium size houses in Dakar. Among them 9,500 units were built between 1960 and 1980. SICAP was transformed into an independent company and is currently developing hundreds of houses each year.

b) SNHLM: National Moderate Rent Housing Company

SNHLM, also established in 1960, has provided more than 9,000 small and medium size houses in Dakar and other regional capital cities between 1960 and 1980. In 1988, SNHLM was transformed from a state-owned to a public company. As of December 1999, 875 housing units were under construction in Dakar.

c) Parcelles Assainies

Since 1965, state-owned land has been developed into housing sites which comprises streets, drainage, and basic infrastructure. This type of site preparation, without actual house construction, became increasingly popular in Dakar. It is planned that 1,500 to 2,000 units of such housing sites in the country will be produced each year.

d) BHS: Senegal Housing Bank

BHS was established in 1979 through World Bank support to provide private finance for housing development. BHS simultaneously provides financing for private and semi-private developers, including HAMO and various employees' cooperatives. 1,200 private finances are provided each year.

e) BHSO: Collectivity Assistance Bureau for Social Housing

Housing cooperatives are becoming a successful form of self-development among the middle class in Dakar. BHSO was created to support local authorities by providing technical and financial support.

f) SCAT-URBAM: Urban Land Development Company

In 1988, SCAT-URBAM was established with World Bank support to develop 10 housing sites around Dakar for 1,800 housing sites over 10 years. The government provided main roads and basic infrastructure, and BHS provided the finance.

g) **HAMO: Modern Housing Company**

HAMO was one of the entirely private housing development companies in Dakar, and used a prefabrication system for their houses. HAMO is no longer existing, however there are several private housing development companies in Dakar targeting specific markets.

All these organizations are now working on housing development in Dakar in an organic manner, providing new housing construction, new site development, and redevelopment of existing housing sites. The IIMS would assist in the overall evaluation of infrastructure provision and setting priorities for future provision. Deficiencies in existing housing, such as quality, accessibility, and high density, can be evaluated and candidate sites can be evaluated for future development.

(2) **Utility Companies**

As for the provision and management of utilities, the following organizations currently in operation can be found in Dakar.

a) **CUD: Dakar Urban Community**

CUD constitutes municipalities in the Dakar metropolitan area and performs various management activities. However, solid waste management is its only function since urban management was decentralized to each municipality. Solid waste management in Dakar is generally poor due to a lack of appropriate equipment and vehicles, as well as inappropriate collection routes and poor personnel management.

b) **SONATEL: National Telecommunication Company**

SONATEL was created by the separation of telecommunication and postal services. SONATEL provides domestic and international calling services for the entire country.

c) **SNELEC: National Electricity Company**

SENELC is responsible for electricity production and distribution to the entire country. A rapid increase in the number of connections and rate of consumption has created one of the crucial problems in Dakar.

d) **SONES: Senegal National Water Exploitation Company**

SONES is a public company in charge of water resource development and management.

e) SDE: Senegal Water Company

SDE is a private company responsible for water supply, including management of the distribution network.

f) ONAS: Senegal National Sewage Office

ONAS is a public company responsible for waste water management.

The IIMS would assist in the evaluation of locational alternatives in planning. Areas lacking in public facilities can be identified and potential sites compared for new facilities.

2.4.2 Laws and Regulations

(1) Urban Planning Code

The Urban Planning Code of 1966, which was derived from French urban planning regulations, was for a long time the institutional framework of Senegalese urban planning policies.

The Law 88-05 of June 20, 1988 (New Urban Planning Code) modified the reference framework of municipality development. Among other things, it confirmed the importance of Urban Planning Master Plans (PDU), created the notion of special development areas (see below), and specified how urban intervention funds are to be used.

The Urban Planning Master Plan (PDU) is an enforceable decree and is the basis of development operations and planning permissions procedures. The PDU should be accompanied by a Municipal Investment Program (PICS), which expresses the PDU in financial terms describing necessary investments project by project. At present, all regional capitals, including Dakar, have a PDU or the Development and Urban Planning Master Schema (SDAU), and studies are underway for other towns.

The New Urban Planning Code also created the concept of the special development zone: an area of land renovation specified by regrouping or restructuring settlement lots and a zone of mixed housing development (ZAC). The ZAC is entrusted to a development agency (public, parastatal, or private) which, on behalf of the State, coordinates investments, develops and prepares the land, and grants it to development companies which are parastatal.

(2) Institutional Systems for Urban Development Guidance

The Government, specifically the Department of Urban Planning and Architecture (DUA) under the Ministry of Urban Planning and Housing (MUH), has long been

responsible for land development and building guidance. With the recent decentralization program of the entire public administration system, this guidance work has shifted to local governments. In the case of the Dakar Metropolitan Area, the responsibility belongs to the municipality of Dakar, Pikine, Guediawaye, Rufisque, and Bargny. However, because of a constraint in human resources and administrative know-how, only Dakar Municipal Government can manage this guidance work without the assistance of central government.

After some confusion on land ownership following independence in 1960, the Senegalese government declared that any land which had not been registered by 1964 would be recognized as state land. Only a very limited area is registered in the suburb area of the capital city, Dakar. The DUA sets the Detailed Urban Development Plan (PUD)³ in these registered areas. The DUA has prepared about 20 PUDs in the Dakar metropolitan area. Applications of housing development and building construction proposed in the PUD areas can only be processed and approved if they satisfy all the code and zoning regulations. However, if these conditions are strictly observed, the metropolitan area cannot accommodate the increasing population. In deed, the majority of the residents in Pikine area are living in illegal settlements in this sense. These illegal settlements have been formed with very little planning, and are suffering from problems such as flooding, poor road network, and insufficient or unequal public facilities. The current legal system for urban planning is not effective in terms of supplying sufficient dwellings for the rapidly increasing population. The system does not accommodate such low income people within its scope. Only a limited number of households can afford housing constructed in accordance with all the legal procedures.

The concern of the Senegalese authority has gradually shifted from the evacuation of squatters in the state land to improvement of their low-standard settlements. A typical example of this policy is the Dalifort project. The project began in 1986 to improve an illegal settlement called Dalifort. The DUA, in close cooperation with German GTZ, implemented a land readjustment project in this squatters' settlement. A distinctive aspect of the project was not the improvement of infrastructure, but its authorization of the land ownership for the squatters, who are expected to pay a small amount of money for infrastructure and land registration. This program is called "Droit à la ville", or "The right to live in the city". DUA established the "Droit à la ville Foundation" to promote this movement in January 2000.

³ PUD is an execution device of PDU dealing with strategic areas within the area covered by PDU. A PUD is prepared typically utilizing a scale of 1:2000 or 1:1000 whereas a PDU uses 1:5000.

(3) Regulatory Criteria that can be Employed in IIMS

PUDs regulate land use in their areas. Each PUD uses a land use classification scheme according to its particular needs. However, the new Urban Planning Code is applied widely at the national level. Some articles of this code have criteria (some with specific figures) that all proposed housing developments should observe. Table 2.4.1 shows some examples of the regulatory criteria that can be employed in IIMS. Because the IIMS will use information with the scale 1:5,000, highly detailed criteria, such as set-back from the road line, can not be incorporated into the IIMS.

Table 2.4.1 Regulative Criteria from the Urban Planning Code

Article No.	Criteria
24	Net Residential Area Density (DRN): Residential area should be less than 70 %. Road area should be more than 15 %. Areas for public facilities should be more than 15 %.
25	The density of built-up area is defined by Building Coverage Ratio (COS) and Floor Area Ratio (CES).
26	Building Coverage Ratio (COS): COS should be determined appropriately taking into account the zoning.
27	Floor Area Ratio (CES): CES should be determined appropriately by taking into account the zoning.
72	Norms for Green Area: Sport facilities should be more than 3 m ² /person. Park area should be more than 4 m ² /person.
211	Building permit will be refused in danger of natural disaster such as: flooding, erosion, land slid, etc.
212	Building permit will be refused in case the site is not accessible by a public or private road.
213	Housing sites should keep away at least 50 m from highways and 25 m from major roads.
215	Water supply should be appropriate (implies piped water supply).
216	Waste Water Disposal should be appropriate.
217	Drainage should be appropriate.
223	Housing parcel: The parcel should face to the road by at least 10 m. The minimum lot size should be more than 70m ² .
228	Building facade height: The facade height should be less than: $H=1.3*L$ (road width + set back)

Source: DUA

The IIMS would help facilitate enactment of the Urban Planning Code and institutional systems through improved information retrieval of land use plans and building restrictions. Accordance with regulative criteria can be efficiently effected through the use of thematic maps. For example, a building permit application can be refused if the site is not accessible by road or does not have piped water supply, the adequacy of which can be retrieved and displayed by the IIMS.

2.4.3 Urban Development Control

Whereas PUD provides general guidelines for urban development in the Dakar Region, actual administrative control of urban development is largely being done by two administrative devices: the issuance of urban planning certificate and the examination and granting of building permit.

According to the recent Government's policy, the power of authority which issues building permits belongs to each municipality. The mayor gives the signature of approval. However, because of the limited number of personnel at the municipal level, the Dakar regional urban planning office and its branches in Pikine and Rufisque, which are part of DUA, examine the technical aspects of applications.

All applications in the areas of Dakar Plateau, les Almadies and other sensitive areas, and all large scale development projects are subject to a joint examination by DUA head office and branch offices at the headquarters of DUA. The DUA, the regional office and its branches have regular meetings for this purpose. The number of applications varies. About 600 applications for the building permit were submitted to the Dakar regional urban planning office in 1999. It should be noted that not all of them proceeded to DUA, and not all constructions were legally approved ones in the Dakar metropolitan area. However, this permit process must be an important step towards better managed urban development.