

**The Impact of Investments in
Urban Infrastructure on
Municipal Revenues and the
Integration of Informal Sector
Activities**

The Abidjan Experience

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AND THE INTEGRATION OF INFORMAL SECTOR ACTIVITIES
THE ABIDJAN EXPERIENCE*

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1.0 Summary of findings and recommendations

1.1 Objectives

Structural adjustment policies in Sub-Saharan Africa have resulted in widespread urban unemployment and poverty with dire but predictable social and political consequences. The urgency for action has shifted from the rural to the urban setting. Revitalization of the urban economy will require public investment in infrastructure to prevent the deterioration of the existing physical plant and to extend networks to the vast areas which are presently lacking the basic infrastructure needed to support economic development. There is an urgent need to seek new approaches that address the key issues of shrinking employment opportunities, erosion of household income, and the degradation of the living environment. It is therefore pertinent to look at upgrading projects implemented during the past decade. These projects have only been evaluated from the viewpoint of their social objectives. Yet, they provide the best laboratory for the assessment of the economic and environmental impact of urban infrastructure in low income communities since donor agencies cannot lose sight of the social dimension. It is from this angle that the Abidjan projects are reassessed. Accomplishments are measured in terms of:

- capacity to stimulate the development of income generating activities, formal and informal;
- contribution to municipal revenue; and
- improvement of sanitary conditions in the area.

Constraints on achievements are examined in order to pinpoint the bottlenecks hindering the fulfillment of anticipated benefits and identify actions initiated by central and local authorities.

1.2 Summary of Findings

1.2.1 Economic assessment. Upgrading allowed existing activities to expand and sometimes evolve into micro-enterprises by expanding the scale of their operations and/or raising service standards. More importantly, it generated a range of new commercial and service activities, some of which can be classified as small business establishments with one to five employees. Interviews confirmed the key role of paved roads, reliable water supply and electricity as determinants of locational choice for "modern" type businesses such as appliance repair, printing and professional offices. Likewise, improved accessibility, visibility, increased pedestrian circulation and sidewalk space were found to be necessary catalysts for the emergence of a variety of traditional activities: food, vending, stalls, peddling of produce and wares and personal and business services.

Road paving was singled out as the most important factor in the promotion of economic activities. With the exception of health related businesses, sanitation was not mentioned as an important consideration in locational decisions.

Upgrading projects enhance municipal revenues through two sources: additional real estate taxes resulting from the appreciation in the value of properties in the upgraded areas and commercial taxes collected from the induced expansion of economic activity in the area. Real estate taxes account for less than 20% of municipal revenue.

Recent efforts by the cadastral services to expand coverage have resulted in a marked increase in billings without a commensurate increase in yield because of the inability to collect. Since taxes are only collected in regularized and accessible areas, road paving emerges as an important factor in real estate taxation.

Commercial taxes are the mainstay of municipal finance and account for over 50% of revenue. The local commercial and market taxes collected directly by the communes provide an institutional framework for the integration of the informal sector in the public finance system. They allow the municipalities to derive a return on public investment in roads and markets, despite the decline in yields from the centrally levied tax. The impact of upgrading was reflected in increased revenue from commercial taxes.

The dynamism of local structures encourages creativity and innovation. Mayors are developing new foci of activity within the neighborhoods and exploring new sources of revenue generation. They value most the infrastructure that sustains commercial activities.

1.2.2 Environmental Assessment. The very success of the upgrading program accelerated the transformation of the urban fabric along major roads where environmental conditions have improved markedly, sustained by commercialization and gentrification. On side streets further removed from commercial arteries, conditions have deteriorated relative to their post upgrading levels eroded by densification and inadequate maintenance.

The problems observed arise from inefficiencies in the utilization of available systems; misuse of existing infrastructure; and inadequate maintenance of sanitation works. Abidjan has privately operated water supply, electricity and solid waste collection services which function well. Unfortunately, shortcomings in performance affect mostly the city's lower income communities.

The operation of the water supply system is satisfactory but the maintenance of sanitation networks is inadequate. Connections to water supply and sewerage networks are complicated, expensive and must be paid for up front. The vast majority of renters in upgraded areas continue to purchase their water from vendors. This has tended to perpetuate traditional but overloaded

systems of on-site waste water disposal and illegal connections to the storm drain or drainage ditches.

The solid waste removal service covers the primary roads, segments of the secondary road system, and the main market areas. The operator will only collect trash and garbage deposited in bins and dumpsters. The bulk of the refuse generated by households and informal activities in lower income areas is not collected and ends up on the road bed or in drainage ditches.

Communes are responsible for the maintenance of the tertiary road system and part of the secondary network, street cleaning and garbage collection, weed control and the cleaning of drainage ditches. They lack the resources needed to adequately operate and maintain the infrastructure for which they are responsible. Sanitation is invariably ranked as the most pressing and intractable problem.

Reliance on revenue from real estate taxation hampers street paving and maintenance and the construction and operation of sanitation works. Receipts fail to cover the most basic operation and maintenance costs. Priority is given to drainage and other works suffer from neglect.

The ability of communes to develop a rational strategy for planning and implementing infrastructure improvements is impaired by the sharp and erratic fluctuations of the tax yield.

1.3 Impact of Decentralization

In a context of dramatic decline in incomes, civil unrest and changing political structures, crisis management in the cities of sub-Saharan Africa is occurring within an evolving institutional framework for administrative decentralization. The city of Abidjan, which used to be divided into districts headed by appointed deputy mayors, now consists of a federation of ten communes headed by elected mayors.

The transfer of administrative powers and responsibilities to elected mayors and municipal councils is promoting a new sense of empowerment and accountability. Communes now can set their own priorities for capital and operating expenditures and implement small scale works on their own.

They have opted for experimentation with innovative approaches to deal with intractable problems. Local programs include:

- sustained outreach efforts to sensitize residents to the hazards of unsanitary practices;
- strategies promoting the organization of community groups to mobilize residents for concerted actions;

- the formulation and funding of incentive programs; and
- developing a capacity to generate resources locally.

1.4 Recommendations

Defining infrastructure projects in terms of narrow physical and economic objectives and appraising their feasibility in terms of broad criteria for cost reduction and replicability fails to recognize their more important longer term impacts.

The Abidjan projects have demonstrated that upgrading brings about a new awareness of urban infrastructure as a valuable capital asset for the beneficiaries and the communes and foster the adoption of internally defined procedures to regularize informal development and integrate informal sector activities.

1. There is an urgent need to reformulate appraisal and evaluation criteria for urban infrastructure projects, one that recognize:
 - their value as generators of economic growth;
 - their contribution to strengthening the municipal tax base and shoring up revenues;
 - their role as effective institution building mechanisms guiding local authorities towards a reformulation of their role as catalysts, coordinators, and initiators rather than sole producers of public improvements.
2. There is also an urgent need to redefine the frame for the assessment of their economic feasibility. A pragmatic evaluation of institutional capabilities and weaknesses in the central/local interface would dispel unrealistic expectations regarding cost recovery within the boundaries of specific project areas through plot charges and user fees.

The development generated by improvements in urban infrastructure needs time to materialize the time lag needed for induced activities to get established and flourish is an important consideration since the economic cost of delayed benefits is high. The shape of the time stream of benefits and their incidence is a key determinant in the definition of an appropriate frame for project appraisal, geographically and institutionally. In Abidjan, this frame would be the commune rather than the neighborhood, keeping in mind that some benefits will accrue to higher levels of government.

3. Decentralization and enabling legislation are necessary preconditions to initiate constructive approaches to self sustaining urban development in lower income communities. The local level is the pivotal node around which the interface between the formal and informal sectors can be structured. It is the effective platform for organizing and empowering citizens to take charge of their own living conditions.

2.0 Study Objectives and Methodology

2.1 Objectives

The neighborhood upgrading demonstration projects (see Figure 1) were implemented in Abidjan as part of the first Urban Development Plan jointly funded by the World Bank (PDU1) and U.S.A.I.D. (HG-003) in 1976. Project implementation started in 1979 and construction was completed in 1983. The projects were designed to promote concepts of self-sustaining urban development for lower income communities. They proposed to achieve this objective by:

- improving sanitary conditions by providing paved roads, storm drainage, piped water supply and sewerage;
- producing options affordable to the target groups; and
- initiating a process of self-financed upgrading by demonstrating the feasibility of cost recovery to ensure replicability.

A narrowly defined assessment referring only to the above mandate would rate the projects as qualified successes in that they have only partially fulfilled their stated objectives. Yet, compared to many similar projects implemented elsewhere in the world at that time, the Abidjan Experience ranks well above the norms, possibly in the top 10 percentile.

Longer term problems can be grouped in two broad areas:

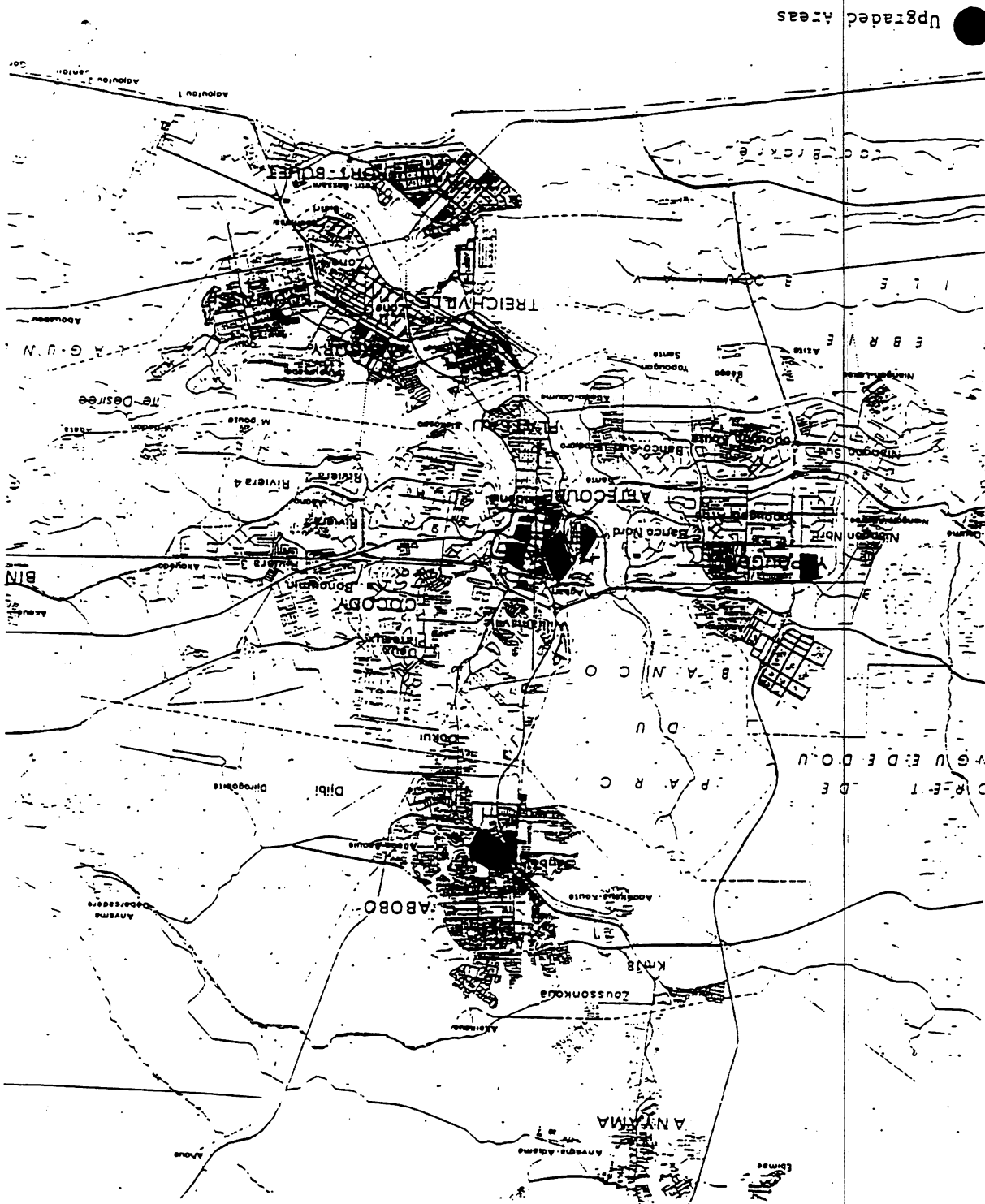
- sanitation, one of the most intractable problems in Abidjan; and
- cost recovery for which procedures and formulas remain entangled in a web of legal, administrative and cultural issues.

Issues related to sanitation are addressed in the environmental assessment section and constraints on cost recovery are discussed in the economic assessment section.

Over the years, the immediate improvements in the living conditions of the urban poor in the project areas have been somewhat mitigated by densification or gentrification. It is estimated that during the 6 years from project inception to completion, densities in the project areas increased by 50%. Already a degree of population turnover was noticeable particularly in Adjamé.

The most cursory comparative survey of the upgraded areas and non upgraded adjacent zones will suffice to demonstrate that the impacts of upgrading on the quality living environment can no longer be a subject of debate. Photographic documentation of the same sites before and after upgrading offer even more telling evidence of the remarkable improvements achieved by the projects.

Fig. 1 LOCATION OF UPGRADED AREAS



Three separate evaluations of these neighborhood upgrading projects have been undertaken since 1982. One by the World Bank as part of its project completion report, the second in 1983 by the urban division of BCET for the Ministry of Construction and Urbanism, and the most recent in 1989 by PADCO for U.S.A.I.D. These studies give different appraisals of accomplishments and impacts.

The following assessment will not reiterate their findings and conclusions. Rather it will concentrate on analyzing those issues which have constrained the fulfillment of the projects' potential benefits in the longer term. The report will also present the approaches by which central and local authorities are attempting to deal with these issues. Finally it will evaluate the projects with reference to this broader context.

2.2 Methodology

The methodology was designed to make the most intensive use of the two weeks spent in Abidjan. In order to undertake the proposed analysis, the research effort needed to:

- clarify the complex issues involved in the assessment of impacts;
- examine the causes of significant shortcomings in anticipated benefits;
- cover areas of concern to both PRE/H, Washington, and the RHUDO office in Abidjan; and
- identify promising initiatives contemplated and implemented by local authorities to alleviate the most pressing problems.

To fulfill these objectives the methodology relied extensively on direct observation and interviews. The information presented in the report was assembled from the following sources:

1. Site visits and documentation of the physical conditions in the project areas to record the longer term impacts of upgrading.
2. Interviews with officials and experts listed in Annex 1.
 - 2.1 Interviews with high officials responsible for policy formulation at the Ministry of Construction and Urbanism (MCU).
 - 2.2 Interviews with the Mayors, key officials and heads of technical services in the communes.
 - 2.3 In depth interviews with technical directors and experts in the Direction et Contrôle des Grands Travaux (DCGTX) and the Ministry.
3. Interviews of a limited number of small businesses and households in each neighborhood to record responses to upgrading and elicit attitudes towards improvements of basic

infrastructure. These interviews were carried out as a parallel and supplemental assignment undertaken by Mr. Maurice Kimou and Mr. Gustave Alleby of the ORSTOM research center. The text of their report is given in Annex 2.

Preliminary findings were discussed with officials responsible for planning and implementation in the relevant central and local agencies to get further insight into particularly complex issues.

2.3 One Day Workshop on Urban Infrastructure (June 18, 1990)

At the conclusion of the mission in Abidjan the RHUDO office held a workshop to highlight key issues raised in the study and discuss their implications. The Workshop was attended by 30 participants including the officials and experts who had contributed time, information and ideas to the analysis presented in this study: the Mayors of Abobo, Adjamé and Yopougon, officials and experts from MCU and DCGTX, The World Bank regional water and sanitation group and the ORSTOM research team. Other participants included officials of the Department of Local Government RHUDO's principal partner in the current secondary cities project (HG-004), the Mayors of Grand Bassam and Koni, officials from the Ministry of Social Affairs involved in upgrading activities and fellows of the CRAU research center interested in issues of urban management.

The seminar was chaired by Mr. Stephen Giddings, structured by Dr. Mona Serageldin and organized by Mr. Michel le Breton of RHUDO's training office.

The interactive format relied on the involvement of every participant. The mayors were invited to present innovative programs identified through the study and comment on their approach in light of problems and opportunities in each commune. Officials and experts in executive agencies were asked to talk about the most challenging aspects of their work. Their contributions are discussed in the appropriate sections of this report.

The workshop was productive, stimulating and greatly appreciated by the participants. It afforded a useful forum for the exchange of information and ideas among different agencies and levels of government. It was timely given current policies of administrative decentralization and the devolvement of decision making and managerial responsibility from city authorities to elected mayors in the communes.

3.0 Brief description of the project areas

The four project sites are located in three communes, Abobo, Adjamé and Yopougon, with sharply contrasting characteristics (Table 1). This diversity will enrich the analysis by highlighting the differences and similarities in performances and impacts of infrastructures under different conditions of operation and use.

A site in Attécoubé was added to the program when extra funds became available as a result of a decline in the exchange rate of the franc against the dollar. This site has been excluded from the analysis since upgrading work is still underway.

3.1 Abobo

Abobo lies at the northern edge of the city and is the fastest growing commune in Abidjan (Table 2). The rapid expansion of the urbanized area occurred mostly through informal development of village lands held under customary rights by the original Ebrié owners. The resultant fabric consists of unplanned though sometimes reasonably well laid out subdivisions extending outward from the old villages. This haphazard sprawl gained momentum throughout the '80's fueled by the saturation of central districts and new policies and procedures for the regularization of subdivided village lands.

The upgraded neighborhood referred to as Abobo Gare or "112 hectares" grew as an informal settlement. Hence the relatively large size of parcels which average 500m². The dominant housing type is the compound (Habitat à cour) sheltering 5 to 10 households in one- and two-room dwellings around a yard. The larger units front on the street and the smaller ones are lined up against the back wall and open onto the yard. Shared sanitary facilities are located at either end of the yard and the built up area covers 80 to 85% of the plot.

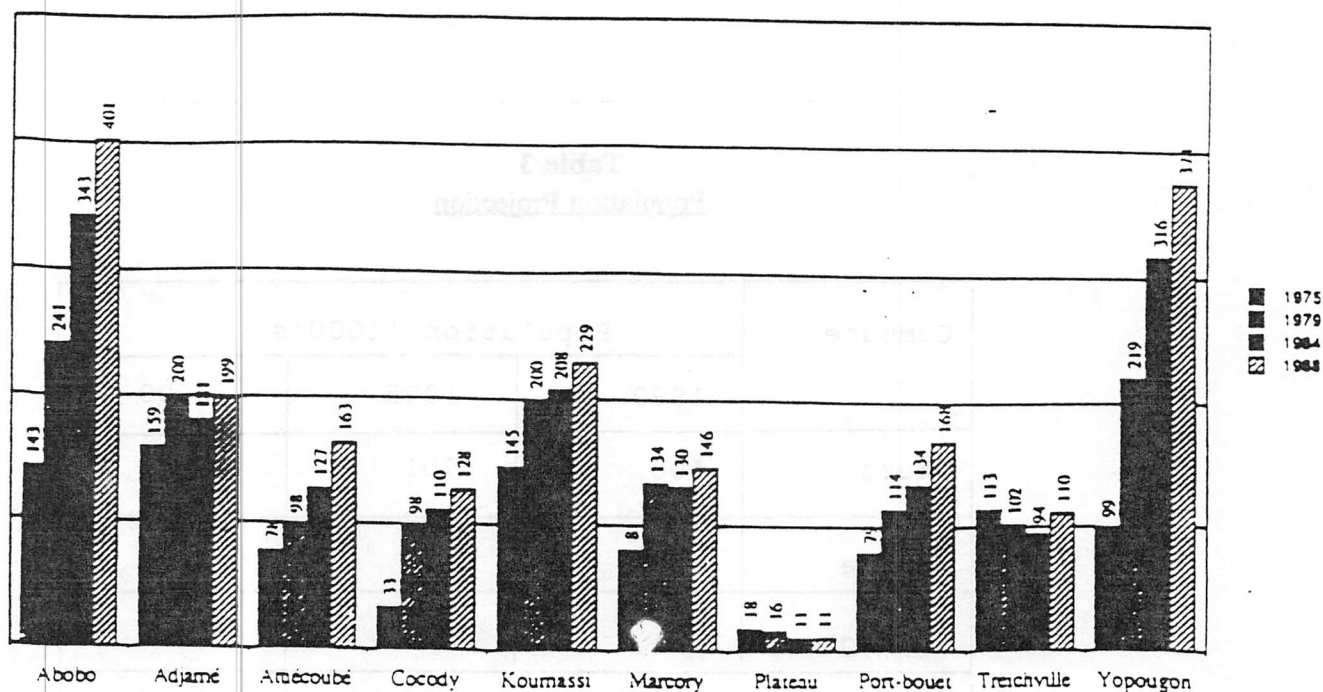
3.2 Adjamé

Adjamé lies at the heart of the city to the north of the CBD (le Plateau). It contains the major transportation terminal and the nodes connecting the main North/South highway to the East/West routes. The urban fabric consists of commercial strip on the thoroughfares backed by or intermixed with very dense and overcrowded housing. Active market areas and a central covered market reinforce the commercial character of the district.

The upgraded neighborhood known as Pélieuville ("Liberté et Fraternité") and Bromakoté densified rapidly in the '60's and '70's in response to the economic boom and the locational advantages of the site. Housing compounds of different sizes, shapes and structural quality, cover parcels of 400 to 500m² and house an average of 10 households in one and two room

Table 1
Population Growth in the Communes of Abidjan, 1975-1988
 (in 1,000s)

COMMUNE	1975	1979	1984	1988
ABOBO	143	241	343	401
ADJAME	159	200	181	199
ATTECOUBE	78	98	127	163
COCODY	33	98	110	128
KOUMASSI	145	200	208	229
MARCORY	8	134	130	146
PLATEAU	18	16	11	11
PORT-BOUET	79	114	134	168
TREICHVILLE	113	102	94	110
YOPOUGON	99	219	316	374
ABIDJAN	875	1422	1654	1929



Source: Dcgtx Working Papers

Table 2
Population and Land Reserve

Commune	Annual Rate of Growth			Available Land Reserves** (ha)
	1975-1979	1979-1984	1985-1989*	
Abobo	13.9%	7.3%	7%	760
Adjame	5.9%	-2%	0%	30
Yopougon	22%	7.6%	7%	970
Abidjan	10.6%	3.9%	4.4%	3,160

* Estimated

** Buildable parcels with access roads already laid out.

Table 3
Population Projection

Commune	Population (1000's)		
	1990	1995	2000
Abobo	500	701	984
Adjame	188	188	188
Yopougon	461	647	907
Abidjan	2,131	2,480	3,356

dwellings. The horizontal expansion of the built up area has reduced yard space sometimes hardly more than a vestigial elongated corridor depriving dwellings of adequate ventilation and crowding out domestic activities which spill over into the streets.

The area had already reached saturation levels prior to its upgrading. The improvements prompted a revalorization of strategically located parcels through vertical expansion, conversion of street frontage to commercial uses and the addition of larger 3 room units on upper floors.

A statistical profile of the 3 communes is given in Annex 2 excerpted from the citywide comprehensive survey undertaken in 1988 by the DCGTX.

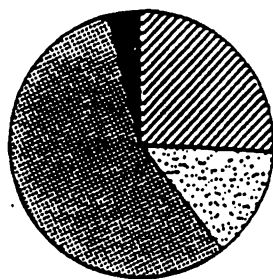
3.3 Yopougon

Yopougon to the East is the second most rapidly growing commune in the city. Urban expansion in the '70's occurred mostly through large scale projects by state housing corporations. The full range of housing options produced can be found in Yopougon, from the serviced plots developed by SETU to the apartment buildings erected by SICOI (Table 4). The predominant form is the economic housing projects produced by SOGEFIHA. The projects combined a variety of prototypes to provide housing for middle and limited income groups. When SOGEFIHA was liquidated in 1985, the housing stock was sold to the occupants through a lease purchase agreement. Private sector construction ranges from GEM cooperatives to informal developments on the urban fringe.

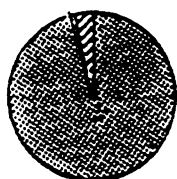
Interestingly, the upgraded neighborhood of Port Bouet II has a strikingly different character. It started as a summarily laid out reception area for the temporary resettlement of squatters displaced by clearances in the Port Bouet Commune. Hence the rectilinear grid, the small plots of 150m², and the lower densities recorded in the 1978 survey when the upgrading project started. Yards were larger than in Abobo since the built up area covered only from 50 to 60% of the parcel. Compounds housed an average of 4 households in dwellings slightly larger than in Abobo.

Table 4
Population by Housing Type

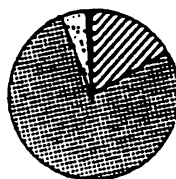
Commune	Standard	Social	Expandable	Squatter	Total (100%)
Abobo	-	3.66%	95.79%	0.53%	407,939
Adjame	0.82%	16.69%	76.88%	5.61%	200,622
Yopougon	0.35%	56.16%	19.70%	13.79%	375,963
Abidjan	4.12%	25.57%	56.66%	13.65%	1,934,342



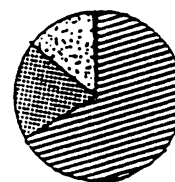
Abidjan



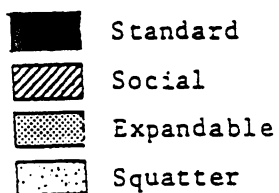
Abobo



Adjame



Yopougon



4.0 Economic Assessment

Upgrading projects require a degree of subsidization in one form or another since cost recovery formulas usually exclude off site works and sometimes segments of the secondary network too. The Abidjan projects are no exception. Plot charges are assumed to recover 50% of the cost of secondary and tertiary systems and user fees the remainder of the recoverable costs. It is therefore pertinent, particularly at a time of retrenchment, to assess whether the beneficial impacts of upgrading can justify the economic cost of unavoidable subsidization.

Economic impacts will be assessed from the viewpoint of the effect of upgrading on local private activities particularly in the informal sector and the return on public investment it can generate through the taxation of real estate and commercial activities.

4.1 Impact on private sector activities

The Ivory Coast has always relied on a balanced participation of the public and private sectors in the urban economy. The role of the private sector grew in importance throughout the '80's as the economic crisis increasingly constrained public expenditure on housing and infrastructure.

The importance of the informal sector in Abidjan is well documented. It accounts for 70% of total employment and is characterized by diversity and segmentation. Micro enterprises dotting the main roads are a dynamic and productive component of the economy. Retail trade, vending and peddling cluster in and around neighborhood and central markets. The scope of the activities can range from large stores to marginal occupations. This subsector accounts for half of the gainful employment in the city even in Yopougon which has a large industrial zone, major public facilities and no central markets (Table 5).

Upgrading is expected to reinforce the development potential of the project area by providing the infrastructural support required for economic activities to flourish. The creation of employment opportunities and the promotion of income generating activities in lower income communities is considered a major objective of upgrading programs. The range of formal and informal activities: shops, workshops, service businesses, vending stalls and markets observed in the upgraded areas clearly demonstrates that expectations have been surpassed despite the economic recession.

The interviews carried out by Kimou and Alleby with a selected sample of small scale activities confirmed the key role of paved roads, reliable water supply and electricity as determinants of locational choice for "modern" type businesses such as appliance repair, printing and professional offices. Likewise, improved accessibility, visibility, increased pedestrian circulation and sidewalk space are necessary catalysts for the emergence of a variety of traditional activities:

Table 5
Commune of Yopougon
Employment Profile, by Location and Major Activity Group

1988

Zone	Informal	Public Service	Retail Stores	Markets	Industries	Total Activity
YPOUGON ATTIE	3614	1555	524	9737	147	15577
YPOUGON KOUTE	517	281	75	2126	0	2999
BANCO NORD	862	258	38	1141	33	2342
BANCO SUD	376	573	101	0	131	1181
NIANGON NORD	100	42	7	1141	0	1290
NIANGON SUD	370	271	127	1950	53	2781
AZITO LOKA	0	6	0	38	0	44
ZONE PORTUAIRE	0	48	0	0	0	48
ANGUEDEDOU	19	153	0	111	1932	2215
ZONE INDUSTRIELLE	734	150	18	0	7297	8199
LOCCOURO	397	99	78	830	0	1404
ABOBODOUME	143	1104	132	275	0	1657
PLATEAU DU BANCO	7132	4550	1100	17352	9603	39737

Source: Dcgtx, "Les emplois a Yopougon", 1989

food vending stalls, peddling of produce and wares, personal and business services. At one end of the economic scale, the projects injected a new vitality in the "petits métiers" by which women and children manage to earn a living or supplement household income. At the opposite end of the spectrum, they attracted to the project sites, businesses and establishments which in the absence of infrastructure would never have located there.

4.1.1 Informal Activities Generated

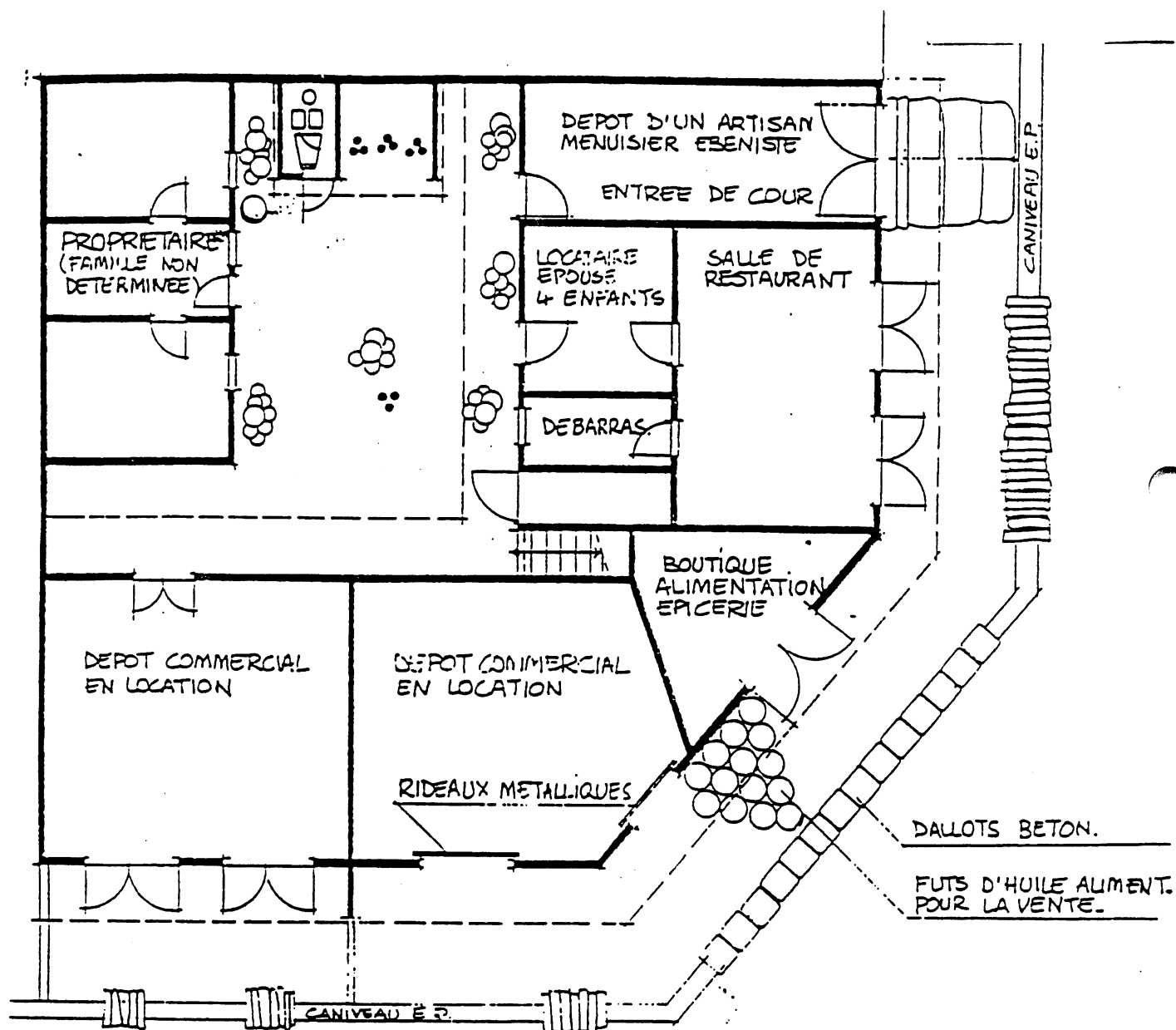
Informal activities which existed prior to upgrading were limited in number and marginal in character. Some could hardly be regarded as anything more than unproductive occupations contributing little to household income. Distressing examples are the array of jobs and chores for which children under 12 years of age are withdrawn from the educational system to earn a pittance at a high cost to Ivorian society at large. In contrast, the variety of food and produce vending, and domestic and personal care services by which women strive to supplement meager household income, or provide for families when male wage earners are unemployed, testifies to their ingeniousness and makes a significant contribution to the family's welfare.

Upgrading allowed existing activities to expand and sometimes evolve into micro-enterprises by expanding the scale of their operations and/or raising service standards. More importantly it generated a range of new commercial and service activities some of which can be classified as small business establishments with one to five employees. The owners of these establishments cited improved infrastructure as the key factor which attracted them to the site. The importance of this evolution should not be underestimated. Informal "petits métiers" essentially provide sustenance. Micro enterprises are important avenues for upward mobility and economic betterment.

A survey of establishments in the project areas is beyond the scope of this assessment. Field observation and sample interviews give an accurate reflection of their dynamism. To quantify the project's impact would require comparative statistical information from a baseline and a current survey. It might be possible to draw on detailed data from DCGTX comprehensive survey of 1988 to arrive at a reasonable estimate.

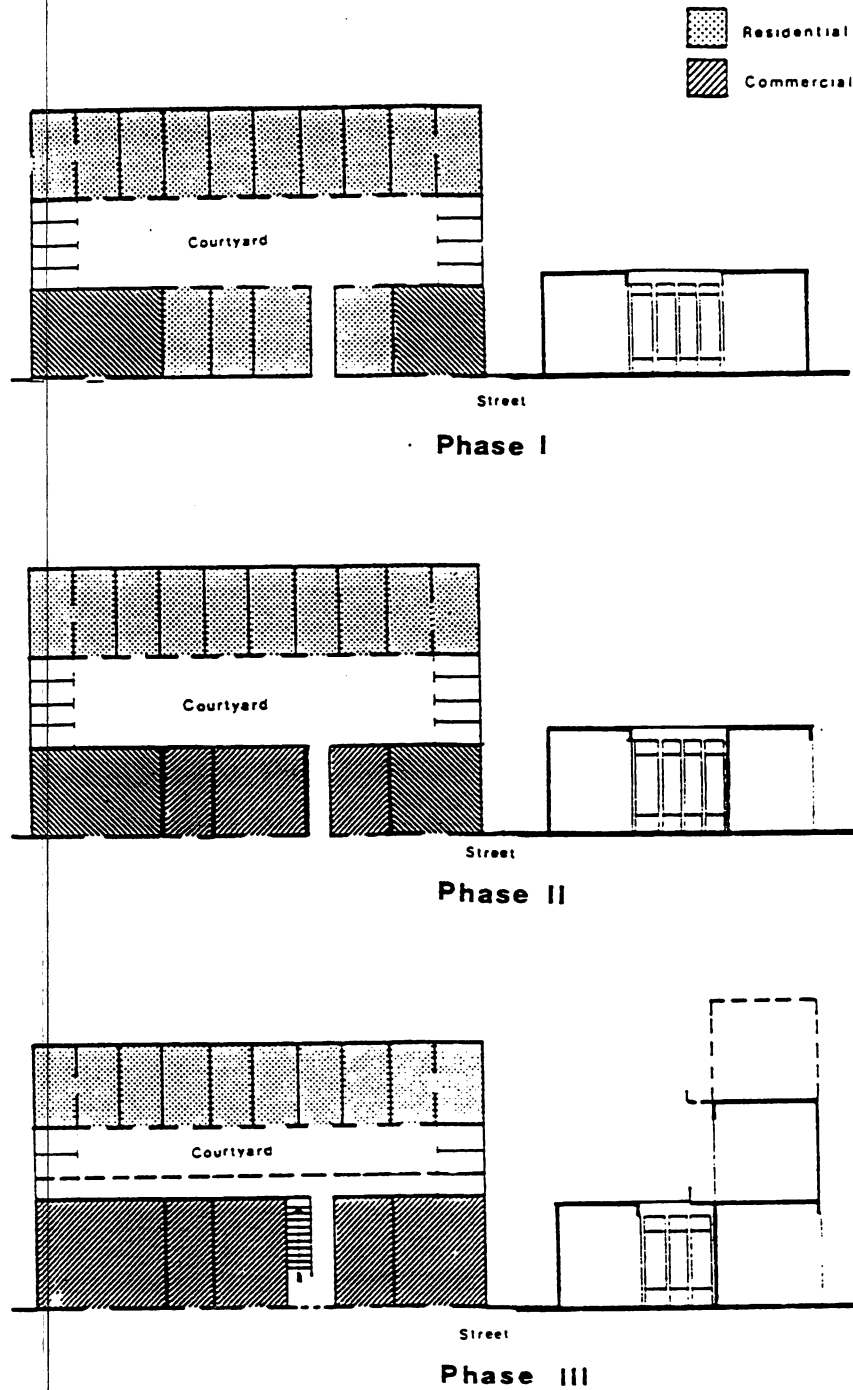
The urban fabric along the main paved roads, particularly in Adjamé has undergone a remarkable transformation (Figure 2). Rooms fronting on the street have been converted to commercial premises. Owner occupants run businesses of their own in these locales while absentee landlords rent them out. At the intersections of two paved roads, old compounds have been torn down and replaced by 2 or 3 story buildings with commercial uses on the ground floor (Figure 3).

Fig.2 HOUSING COMPOUND WITH SHOPS AT ADJAME



Source: Manou-Savina, Anne. Suivi du PDU1, Relevés du cours. Situation novembre 1982, BCET Urbanisme 1982.

Fig.3 CONVERSION OF HOUSING COMPOUNDS TO COMMERCIAL USE



4.1.2 The impact of road paving

In the interviews carried out by Kimou and Alleby, road paving was singled out as the most important factor in the promotion of economic activity. Following heavy downpours unpaved streets are impassable to wheeled transportation including bicycles and pushcarts. The operator himself or hired laborers have to carry supplies from the closest vehicular access point to the store, an unreliable and risky operation. The businesses interviewed invariably mentioned one or more of the following factors as crucial to their operations:

- vehicular access, uninterrupted during the rainy season to guarantee the delivery of supplies;
- the passage of larger trucks needed to transport bulky supplies, machinery, equipment and products such as lumber, mechanical laths, refrigerators and furniture;
- reduced levels of dust particularly during the dry season, an important consideration for businesses which need a relatively dust free environment such as medical offices, pharmacies and establishments utilizing dust sensitive machinery;
- access by emergency vehicles, a service appreciated by security conscious owners concerned about police and fire protection;
- access to a wider market area and the ability to attract a larger clientèle.

Road paving acts as a catalyst triggering a chain reaction which promotes a build up of population and the growth of economic activity. Existing businesses expand and new and larger establishments are attracted to the site. Rising land values induce the demolition of obsolete structures and a more intensive reuse of the land. Rising densities, higher rental yields and more lucrative economic activities reinforce the upward spiral of self-sustained development in the area. In Pélieuville and to a lesser extent in Abobo gare, a growing number of businesses have reached the annual sales volume threshold of 2 million francs and now pay their taxes to the treasury. In Port Bouet II, which was the least developed site prior to upgrading, business owners and vendors alike attribute their good fortune to the influx of new residents and claim that the population has doubled since the mid '80's. The striking contrast between the regularized grid of the project area and the adjacent squatter settlement is particularly telling and testifies to the project's success as a catalyst for economic development.

4.1.3 Other impacts

With the exception of health related businesses, sanitation was not mentioned as an important consideration in locational decisions. Doctors and pharmacies were keenly aware of the health hazard constituted by stagnant water puddles, the breeding place for disease carrying

mosquitoes, and dust, a medium for the propagation of airborne pathogens. Residents appreciated the absence of mud and the decrease in the number of mosquitoes.

When serviced land is at a premium, improvements in basic infrastructure spark investments in real estate and fuel speculation. The increased sales volume resulting from street paving allowed businesses to absorb rent increases without undue hardship. The major cause of displacement was the property owner's decision to evict the lessee in order to run his own business.

In the residential sector a degree of population turnover has occurred. Many renters are concerned about the growing difficulties they have in bridging the rent gap despite supplemental income from lodgers and family members. It is undeniable that some informal activities were displaced to make way for small businesses along the major roads. However this loss was compensated by the emergence of similar informal activities on side streets where they did not exist before.

4.2 Impact on Municipal Revenue

The revenue generation potential of upgrading projects remains largely unfulfilled. This is due in part to an array of legal and administrative procedures which complicate the central/local interface in matters of taxation and collection and in part to cultural factors which impede the effective taxation of the real estate sector. Central and local authorities alike are deprived of badly needed revenue to manage the infrastructure in place and prevent its deterioration not to mention the capital resources needed to expand existing systems and keep up with urban growth.

Upgrading projects enhance municipal revenue through two sources: additional real estate taxes resulting from the appreciation in the value of properties in the upgraded areas and commercial taxes collected from the induced expansion of economic activity in the area.

4.2.1 Real Estate Taxes

The real estate sector in Abidjan is overburdened. There are no less than nine direct taxes on urban property exclusive of the taxation of rental income through the general income tax and the contribution to the National Investment Fund.

There are four basic taxes levied and collected by The Ministry of Finance, Direction Générale des Impôts (D.G.I.). A portion of the receipts is transferred to the Communes according to a revenue sharing formula for each tax. In addition, municipal councils can levy supplemental charges not to exceed 20% of the base tax which are collected on their behalf and added to their share of the receipts.

1. A tax on built property levied on the net rental value of developed properties is the mainstay of the property taxation system.
2. A tax on unbuilt property is levied on the capital valuation of undeveloped building plots in approved subdivisions within the urban perimeter. Informal development and speculative fringe subdivisions are not covered by the assessment.
3. A tax on underdeveloped urban property is intended to deter speculative land holding through token valorization of parcels in approved subdivision. The rate is slightly progressive and applies at the expiration of a grace period granted to complete the construction.
4. A tax on institutional property which includes the taxes on land and buildings owned by real estate development corporations and building societies. It gives a 50% rebate on the above 3 taxes and exempts low cost rental units from taxation.

Two special purpose taxes are levied on all built property without any temporary or permanent exemptions. They are earmarked for infrastructure maintenance: a state tax, the sanitation tax and a municipal tax, the tax for roads and sanitation. They are discussed in the section on environmental assessment.

Communes also levy additional taxes on real estate which are also collected on their behalf by D.G.I.

1. A tax on net income from built property.
2. A tax on capital value of unbuilt property.
3. A tax on rental value of premises subject to commercial taxation "Patentes" paid to the State.

Yopougon's budget for the current fiscal year is the best prepared and most detailed of the budgets submitted to the Ministry of the Interior for approval (Table 6). This budget shows the contribution of the various real estate taxes to municipal revenue. All in all the real estate sector contributes 18.5% of total revenue, a very low proportion indeed.

4.2.1.a Factors affecting the tax base

The rapid expansion of the city in the '70's and '80's has not been matched by a commensurate expansion of the tax base. The rate of urbanization has far outpaced the capabilities of the cadastral services to record new subdivisions. Furthermore until 1977 plots and buildings in informal settlements were considered illegal and theoretically they could be cleared at any time. They were not subject to taxation and the cadastral services did not have to record them. Since the enactment of the law allowing their regularization, and despite the adoption of

Table 6
Commune of Yopougon - Fiscal 1990 Budget

Revenue	1000's CFA	%
A. Fiscal Revenue		
A1. Real Estate Taxes on Built Property	36,000	5.06%
A2. Real Estate Taxes on Land	14,000	1.97%
A3. Real Estate Surtax on Underdeveloped Property	51,000	7.16%
A4. Real Estate Taxes on Real Estate Development Companies.	19,000	2.67%
A5. Taxes on Commercial Premises (Licenses)	3,000	0.42%
A6. Tax on Net Income of Built Properties	N.A.	-
A7. Roads and Sanitation Tax	N.A.	-
A8. Tax on Assessed Value of Land	N.A.	-
A9. Taxes on Rental Value of Business Premises	11,000	1.55%
A10. Fee (Flat Rate) Charged to Small Retailers and Craftsmen and Market Taxes	53,000	7.45%
A11. Taxes on Rented Premises (Furnished)	700	0.01%
A12. Taxes Levied by the Commune on Specific Commercial Establishments (Cinemas, Gas Pumps, etc.)	16,650	2.34%
A13. Taxes on Business Establishments "Patentes"	309,000	43.41%
Subtotal Fiscal Revenues	513,350	72.12%
B. Revenue for General Services by the Commune	47,000	6.6%
C. Revenue on Community Services (Water and Sanitation, Solid Waste Removal)	6,000	0.86%
D. Revenue on Economic Services	67,000	9.4%
E. Revenue from Real Estate owned by the Commune	7,000	0.98%
F. Transfer from Central Government	70,494	9.90%
G. Miscellaneous Receipts	1,000	0.14%
TOTAL REVENUE	711,844	100%

Commune of Yopougon - Fiscal 1990 Budget (continued)

Expenditures	1000's CFA	%
A. Operational Budget		
A1. General Services (Administration)	184,642	25.94%
A2. Community Services (Roads, Sanitation, and Solid Waste)	101,435	14.25%
A3. Socio-Cultural Services (Education, Social Welfare, Sports and Recreation)	24,766	3.48%
A4. Economic Services (Upkeep of the Markets)	31,480	4.42%
A5. Assessment by the City of Abidjan	128,270	18.02%
A6. Other	15,606	2.19%
Subtotal of Operational Budget	486,199	68.30%
B. Capital Budget (Investment Fund)		
B1. General Services Revenue	25,225	3.54%
B2. Community Services Revenue	93,504	13.14%
B3. Socio-Cultural Services Revenue	88,835	12.48%
B4. Economic Services Revenue	18,081	2.54%
Subtotal of Investment Fund	225,645	31.70%
TOTAL EXPENDITURE	711,844	100%

them. Since the enactment of the law allowing their regularization, and despite the adoption of measures to simplify technical requirements, the process has remained very slow. This is due in part to the cumbersome legal and administrative requirements of the law and in part to the budgetary constraints which make it difficult for the Ministry to secure the front end capital needed to service them. The potential integration of informal settlements will affect most Abobo where informal development has been heavily concentrated and to a lesser extent Yopougon.

The two major factors contribute to erode the tax base:

1. Temporary exemptions granted to new construction for overly long periods: 5 years for non residential uses, 10 years for residential uses and 20 years for owner occupied houses. Yopougon, where development did not take off until the '70's is particularly affected by these exemptions.
2. A permanent exemption granted to owner occupied buildings exclusively in residential use with a net rental value of 150,000 F or less.

As the text of the law does not specifically state that the buildings in question must be in single family occupancy, owner occupants of housing compounds have argued that the exemption applies to them too and have refused to pay their tax bills. The confusion caused by this stipulation has led to its repeal. Starting in 1990 this preferential exemption will no longer be granted. Adjamé has been particularly affected by this clause because of the stock of housing compounds for which owners claimed exemptions (Table 7). Yopougon started to feel its impact when the large inventory of public housing rental units was privatized and sold to occupants.

4.2.1.b Factors affecting collections

DGI estimates the performance ratio of the real estate taxes to range between 20% - 30%. Several factors contribute to promote and sustain widespread evasion. The two most commonly advanced explanations are that high rates discourage compliance and that the hardships created by the recession prevent enforcement of penalties and foreclosures.

In lower income communities two additional factors hinder collections:

1. The popularity of the housing compounds, "cour", as a lucrative investment. Tenants are reluctant to divulge the addresses of absentee landlords, claiming ignorance. The latter usually reside in the more attractive neighborhoods elsewhere in the city and ignore tax bills sent to other addresses. The law does contain a clause stipulating that if a tax delinquent owner cannot be contacted, tenants residing in the property should pay the assessed tax up to the amount of the rent specified in the lease. In practice the clause is

Table 7
Commune of Adjame - Fiscal 1989 Budget

Revenue	1000's CFA	%
Fiscal Revenue	465,468	41.37%
Revenue For General Services By the Commune	525,867	46.73%
Revenue on Community Services (Water and Sanitation, Solid Waste Removal)		
Revenue on Economic Services		
Revenue on Real Estate Owned by the Commune	16,578	1.47%
Transfer from Central Government	117,326	10.43%
TOTAL REVENUE	1,125,239	100%

Commune of Adjame - Fiscal 1989 Budget (continued)

Expenditures	1000's CFA	%
A. Operational Budget		
A1. General Services (Administration)	302,557	30.12%
A2. Community Services (Roads, Sanitation, and Solid Waste)	90,065	8.96%
A3. Socio-Cultural Services (Education, Social Welfare, Sports and Recreation)	116,206	11.66%
A4. Economic Services (Upkeep of Markets)	73,485	7.32%
A5. Assessment by the City of Abidjan	182,247	18.14%
A6. Other	25,911	2.58%
Subtotal Operational Budget	791,634	78.78%
B. Capital Budget (Investment Fund)		
B1. General Services Revenue	33,720	3.36%
B2. Community Services Revenue	134,341	13.37%
B3. Socio-Cultural Services Revenue	78,342	7.80%
B4. Economic Services Revenue	7,548	0.75%
Subtotal	253,951	25.27%
Less Administrative Expenditures charged to the Capital Budget	40,683	4.05%
Subtotal of Investment Fund	213,268	21.22%
TOTAL EXPENDITURE	1,004,820	100%

not enforced and when property owners cannot be located the tax bills remain uncollected.

2. The unstructured development occurring on the urban fringe. Addresses are difficult to specify in the format required for computerized coding by the "service de l'informatique" of DGI.

The impact of upgrading on revenue from real estate taxes is often overlooked. Yet it can be quite dramatic. All too often the focus on the cadastre as the key mechanism to improve taxation obscures the importance of street paving as the single most important factor for collections. The numbering of properties on paved streets allows addresses to be accurately coded. Tax collectors can locate and access the property even during the rainy season.

In Abobo, a census of properties was undertaken to establish a cadastre covering the sprawling urbanization of the northern fringe. The 4 year effort resulted in a marked increase in billings from under 100 million francs to over 450 million francs in 1989. The Mayor is concerned that a commensurate increase in the tax yield will not materialize because of the inability to collect. Abobo's sprawling neighborhoods have 625 km of roads of which only 42 km are paved. The Mayor estimates that the tax bills issued will only be collected in the accessible areas, where they are already being collected.

In Adjamé tax billings have remained relatively stable from 1986 to 1989 increasing only by 5.9%. As of mid 1988 the collection rates for 1986 and 1987 were 12.8% and 10.2% respectively. The overall performance ratio for the 1975/85 decade was 20.2%. In Yopougon the 1987 collections recovered 31.3% of the 1986 billings.

DGI does not regularly inform communes of tax billings. They are only advised of the receipts credited to their accounts. It is therefore difficult for them to estimate the potential yield of the sector and the collection rates of the various taxes. Legally they are authorized to have this information and can obtain it if they persist from the "Direction Générale de la Comptabilité Publique et du Trésor."

Communes can do very little on their own to improve tax yields from the real estate sector. They can request from MCU the regularization of an informal settlement but are only marginally involved in the process beyond this initial stage. They can offer to assist in the survey of properties and the identification of property owners but DGI has consistently declined offers of assistance from local authorities. They can offer to help tax collectors identify and find delinquent taxpayers but the "Service de l'Enregistrement" has been reluctant to communicate listings. Legally the listings of taxpayers cannot be withheld from the communes. After two years of sustained effort the Mayor of Adjamé obtained the information he requested.

4.2.1.c Cost recovery for the upgrading projects

Cost recovery will occur through plot charges levied and collected by the DGI. The formula is a flat rate per square meter of parcel area distributing the recoverable infrastructure costs on the total net residential area covered by the plots. The "Direction de la Conservation Foncière" of DGI has established registers listing the 5,000 property owners who benefited from the USAID financing. The cost recovery process is assumed to start imminently. Theoretically the process should go smoothly. In practice, it will be constrained by all the factors which at present impede the collection of real estate taxes.

The link between a plot charge collected in 1991 and infrastructure provided in 1982 is tenuous at best. Property owners are likely to view the charge as an unwarranted government exaction on land they have already purchased and may refuse to comply. Enforcement will be difficult since it would imply foreclosure procedures.

4.2.2 Commercial taxes

Commercial taxes are the mainstay of municipal finance in Abidjan and account for over 50% of revenue. There are two main taxes:

- 1) The "Patente", a tax levied by the DGI on larger businesses with an annual sales volume of 2 million francs or more.
- 2) The "Taxe Forfaitaire", a flat rate tax levied on small retailers and craftsmen and collected directly by the communes. Small shops and workshops pay on a monthly basis while vendors selling from displays and stalls in the market areas pay a daily fee for a "ticket" which allows them to trade in the market.

In Yopougon, the Patente generated 43.4% of the municipal revenue and the local commercial and market taxes 7.45% reflecting the lack of a central market in the commune. In Adjamé, the proportion is reversed (Table 8). The local commercial and market taxes generate 57.8% of the municipal revenue while the Patente has been contributing a declining share mainly due to low collection rates. Over the years Patente tax billings have increased by 30%, but collection rates have declined from an average of 29.1 for the 1975/85 decade to 19.8% in 1986 and 12.2% in 1987 (Tables 9 and 10). Only peddlers of food, produce, newspapers, and cigarettes are exempted from taxation but not those selling beverages.

Table 8
Revenue from Market Vending Tickets

ADJAME 1989

Location	Revenue (1000's CFA)
Grand Marche	169,400
Bromakote	19,584
Habitat-Extension	55,913
Gare Sotra	55,525
Other	201,376
Total	471,801

Source: Commune of Adjame

Table 9
Evolution of the Fiscal Budget of Adjame

(1000's CFA)

Budget	1986	1987	1988	1989
Total Revenue	840,355	890,468	1,048,089	1,125,239
Total Operational Budget	599,815		689,916	791,633
Capital Budget (Investment Fund)	105,317	176,104	243,539	213,268
Total Expenditure	705,132		933,456	1,004,819

Table 10
Evolution of Selected Revenues in Adjame

(1000's CFA)

Revenues	1986	1987	1988	1989
Receipts of Commercial Taxes and Tickets Collected by Commune	439,960	569,250	681,816	647,835
Commune's share of Business Taxes Collected by the State (Patentes)	104,550	88,070	26,775	N.A.
Commune's share of Real Estate Taxes Collected by the State	33,939	25,758	N.A.	N.A.

Source: Commune of Adjame

4.3 Overall Assessment

The local commercial and market taxes provide an institutional framework for the integration of the informal sector in the public finance system. They prevent the marginalization of informal economic activities so common in the developing world. The major economic impact of upgrading has been to foster the growth of existing activities and promote the development of new ones. the commercial and market taxes allowed the community to derive a public benefit from the beneficiaries of important public investments in one or two of its neighborhoods.

Decentralization has sharpened local awareness of the value of infrastructure as an economic asset. The impact of upgrading on economic activity was immediately perceived. It was reflected in increased revenue from commercial taxes. Indeed communes value most the infrastructure that sustains commercial activity. Yopougon yearns for a central market for which plans have already been prepared. The mayor is painfully aware that the current budget crisis precludes the implementation of the 1.3 billion francs project in the near future. Consequently he was focussed on bolstering existing local markets by investing in 3 bridges across Thalwegs to link neighborhoods separated by the ravines and on street paving in the market areas. An interesting feature of this program is that the citizens were involved in the setting of priorities for municipal investments. As a result, the renovation of the Municipal Hall "Mairie" was postponed in favor of the bridges, and the investment allocation raised to 30% of the total budget. Adjamé, with a congested central market, is seeking to develop local markets to create foci of activity within the neighborhoods. In both communes the economic impact of these investments did not obscure the social value particularly in terms of generating employment for the youths.

The dynamism of local structures encourages creativity and innovation. Lacking a central market and burdened by a large inventory of tax exempt property, Yopougon has taken the lead in exploring new sources of revenue. The mayor has instituted a 20,000 F fee on building permits per permit for site clearing services, a logical fee to impose in a commune experiencing rapid urban growth. The fee has generated receipts of 6 million francs in 1990.

The mayors also realize that in order to raise the revenue needed to adequately operate and maintain urban infrastructure, the yield from real estate taxation must be somehow improved. They have now become vocal in their request that central authorities provide them with better information on the commune's tax base and work collaboratively with them on improving tax collections to capture part of the appreciation in real estate values that the infrastructure has created.

5.0 Environmental Assessment

Formulated within a framework of cost recovery through plot charges, upgrading projects concentrated on regularizing titles and servicing land. The solutions advocated for programmed improvements treated individually owned parcels as if they were under single occupancy. The focus on property owners diverted attention from the problems entailed by patterns of multiple tenancies and shared facilities.

These patterns were reinforced in "112 hectares" and particularly in Port Bouet II, where the holding capacity of the site could absorb an important influx of population. The central location and commercial potential of the Adjamé sites, where residential densities were already close to saturation levels, entailed a degree of displacement and turnover triggered by expanding commercial activities and rising rents.

The very success of the upgrading program accelerated the transformation of the urban fabric. Decisions by owner occupants, the major beneficiaries of the resultant appreciation in property values, dictated an evolution in one of two directions. Either parcels were redeveloped leading to significant displacement and gentrification, or owners became shumlords—mostly absentee-maximizing rental income through indiscriminate cramming of dwelling units on the parcel.

The two trends are noticeable in all 3 project areas. The former occurs mainly along major roads where environmental conditions have improved markedly but at a social cost. The latter occurs on side streets at a distance from commercial arteries. This is where environmental conditions have deteriorated relative to their post upgrading levels eroded by densification and inadequate maintenance.

The shortcomings observed in the upgrading areas are the result of social, cultural, institutional and technical factors which perpetuate conditions leading to:

- Inefficiencies in the utilization of available systems;
- Misuse of existing infrastructure; and
- Inadequate maintenance of sanitation works.

5.1 Issues related to the utilization of the infrastructure provided through the upgrading projects

According to recent World Bank estimates, 87% of Abidjan's population has access to water supply but only 30% have access to tertiary sewerage networks. Of the remainder, 20% lack sanitary facilities altogether while 45% have more or less functional on site installations. Typically these systems consist of a tank (which is not a septic tank) where wastewater from toilets,

showers and wash basins accumulate. The outflow discharges into a pit which does not permit leaching of the effluent. Tanks have to be pumped out at intervals. When the pit fills up with sludge it is plugged and cemented over and a new pit is dug in the yard. This popular method of disposing of wastewater has posed challenging problems for upgrading purposes.

Connections to water supply and sewerage networks have to be worked out on a case by case basis according to the number and location of water points, usually 3 or 4, and sanitary facilities in each yard. The layout of pipes and the fittings required are different for each parcel. Connections to the sewerage network are particularly complicated and expensive to install. Typical housing compounds surveyed prior to and after the completion of the upgrading projects are shown in Annex 4.

At this time, it is estimated that about 60% of the properties in the upgraded areas are connected to the water supply network and 20% to the sewerage system (Table 11). Income and tenure are major determinants of decisions regarding connections.

5.1.1 Water supply

SODECI charges a basic fee for the installation of a water meter which ranges from 18,000F to 25,000F. The lowest cost connection to 4 water points (toilet, shower, wash basin and sink) runs from 2,000 to 4,000F depending on the layout of the yard. Quarterly water bills at the social block rate for a typical household amount to 4,000 or 5,000F. Under the social connection program SODECI will charge eligible applicants a flat fee for the installation of a basic connection (15 mm pipe up to a length of 30m). The amount is then credited towards future consumption. The social program is financed through a fixed fee levied uniformly on water bills. Its major drawback is that although the connection is nominally given free of charge the beneficiary still has to pay the cost up front and recoup it gradually later.

Almost all owner occupied dwelling units are connected to the water supply system. However its use is restricted to the property owner's family. Tenants in the housing compounds buy their water from the landlord at 200F per barrel which adds up to 18,000F per month for an average household. The more affluent property owners have left the compounds in the upgraded areas preferring to live in modern accommodations nearby or elsewhere (e.g. SICOI housing). Alternatively they have acquired land parcels as soon as they could afford to on the formal or informal market and proceeded to build their own houses. Housing compounds are retained as lucrative real estate investments consisting of premises converted to commercial use on the street frontage and rental units in the back. When they move out, landlords disconnect the water supply and take the plumbing fittings and fixtures with them.

Table 11
Proportion of Plots Connected to Sewerage

Upgraded Areas	Plots Connected to SODECI	Kitchen	Shower	Toilet	All Facilities
Abobo (112 ha)	14.6%	2%	10.4%	-	-
Port-Bouet II	4.7%	10.4%	1.9%	-	0.9%
Adjame	67.6%	8.8%	11.7%	-	38.2%

Source: A. Manou-Savina, Suivi du PDU1, releve de cours, situation novembre 1982, BCET 1982.

Tenants sharing a yard in a compound usually do not install connections. High cost, insecurity of tenure and potential conflicts over water use deter individual or joint action. Some heads of households expressed concern over excessive and uncontrollable water consumption by household members. This concern is not ill founded. International experience has shown that connection to piped water supply does increase consumption by a factor of 5 to 10.

The vast majority of renters in the upgraded areas continue to purchase their water from property owners or shopkeepers or other water vendors. The system endures because water vending is a lucrative business. Plastic hoses stretch and wind along streets conveying water from vendor to buyer in different yards. Individuals, mostly children, line up on the street to fill a variety of small containers. The flourishing trade carried out by water vendors in serviced lower income districts has been a source of visible irritation to SODECI despite the fact its contract contains a clause entitling the company to compensation for any discrepancy between actual consumption and projections by the Direction de l'Eau which provide the basis for contract negotiations.

When the recession set in, water consumption in Abidjan which grew by 8% annually from 1974 to 1983 started to decline at an average annual rate of 0.7% since 1984. Yet SODECI's revenue increased, shored up by compensatory fees. The company is thus shielded from any risk involved in the operation of the water supply system, a risk that is entirely borne by the government. Nevertheless SODECI obviously considers the maintenance of underutilized systems to be a losing proposition. It has recently shut off the mains supplying parts of Abobo and Williamsville in a futile attempt to put out of business the water vendors.

5.1.2 Sanitation

The lack of piped water supply directly affects the utilization of the sewerage network the absence of a water flush prevents the connection of toilets to the sewerage systems and perpetuates the traditional method of on site disposal. There are no readily available solutions to this problem.

Population densities within the housing compounds are overwhelming. The number of occupants can climb rapidly from under 10 in the initial stage to 60 or more when a parcel of 300- 400 m₂ is fully and intensely developed. This process is well documented in the BCET study. In Abobo and Port Bouet many residents complained about inadequate connections. The small diameter of the pipes cannot handle the discharge leading to frequent backups. Permanent puddles of sewage laden waters are a source of pollution during the rainy season. There are no workable low cost sanitation options when densities exceed 1000 persons per hectare as they do in Adjamé. Despite modest levels of per capita water consumption, the volume of wastewater

generated exceeds the capacity of on site systems. Overflowing tanks spill soiled water into the yards and have to be pumped out every 2 to 3 weeks at a cost of 7,000 - 8,000 F per service call.

To relieve pressure on the on-site systems residents regularly dump sillage from domestic uses into the gutters and drain ditches polluting the storm water discharge. Many owner occupants have illegally connected their on-site tanks usually to the storm drain, the underground pipe closest to the property line. On side streets, some connections discharge directly into the open drain ditches. Allowed to multiply, these haphazard infractions, hastily installed to avoid detection by inspectional services, compromise the integrity and operation of the entire system.

DCGTX has recently implemented an experimental project funded by the World Bank to connect 200 parcels in Treichville to the existing sewerage network. The design had to compensate for the lack of water flushing toilets and the layout had to be worked out separately for each yard. The connections work well but are far too expensive to install. At an average cost of 350,000F per connection they are unaffordable to the property owners and to the state. Furthermore technicians at DCGTX anticipate maintenance problems particularly when the vast majority of residents are tenants sharing the sanitary facilities as is the case in Biafra. Consequently DCGTX engineers are now investigating alternative solutions which seek to simultaneously bring down the installation cost to around 100,000 and reduce the likelihood of significant maintenance problems. This research should be encouraged and funding secured to field test promising options over a period of one to two years.

The feasibility of investments in urban infrastructure, particularly for upgrading purposes, depends on mechanisms for cost recovery which rely on a combination of user fees, connection fees and plot charges. Underutilization of systems erodes projected revenue and invalidates the original appraisal. In the absence of workable solutions capable of handling high densities and affordable to the beneficiaries and the state, there is little prospect of improving sanitary conditions in the populous districts. The sewage collection networks retrofitted in existing neighborhoods will remain largely underutilized and uneconomic as a public investment.

Quite apart from the detrimental impacts of environmental pollution on the city as a whole, the social cost of unsanitary living environments is borne by the most vulnerable population group namely infants and children in lower income communities. Toddlers wading in wastewater flowing through the yards and youngsters handling garbage and playing in contaminated soils around clogged drains can be seen in all three project areas.

5.2 Issues related to operation and maintenance of infrastructure networks

Abidjan is rather unique among developing nations in having retained privately operated utilities and services in the post independence era. Compared to other third world countries,

Abidjan's services function remarkably well. However limited shortcomings in performance and monitoring affect mostly the city's lower income communities including the upgraded areas.

5.2.1 Water and Sanitation services

SODECI has been granted the concession for the operation of the water supply system. It has also been awarded a contract for the maintenance of the sewerage and drainage system. Planning and execution of new facilities and networks is entrusted to the water directorate, Direction de l'Eau (DE), in the Ministry of Public Works and implemented through DCGTX. DE oversees SODECI's contract which is reviewed periodically. SODECI's contract covers all underground networks and open drain ditches on the primary and part of the secondary road system.

Central and local technical services concur in rating SODECI's performance as satisfactory regarding the operation of the water supply system and unsatisfactory regarding the maintenance of sanitation networks. However the company's sunk investment in plant and equipment gives it a virtual monopoly on operations in the Ivory Coast as the international tender of 1988 has demonstrated.

5.2.2 Solid Waste Removal

Abidjan has also contracted with a private operator, SITAF, for solid waste removal within city boundaries. The contract covers the primary segments of the secondary road system and the main market areas. SITAF operates a fleet of trucks and will only collect trash and garbage deposited in bins and dumpsters. Its crews do not sweep streets nor do they collect garbage which has spilled over from overflowing dumpsters. There is no pick up service on Saturday afternoons, Sundays and holidays.

5.2.3 Road Maintenance

Roads are classified in 3 categories (Table 12):

- National roads are the responsibility of the State;
- Urban roads are maintained by Abidjan city; and
- Local roads are maintained by the communes.

Street lighting is provided through EECI, the private operator of the electric power supply system. Communes within Abidjan's administrative boundaries have to pay the City an annual contribution as a reimbursement for the services it provides. The amount is computed according to a formula based on the commune's population and revenue.

Table 12
Status and Responsibility for Roads - 1985

Roads Commune	National ¹	Urban ²	Communal ³		Total (100%)
			Paved	Unpaved	
Abobo	6.48%	-	11.51%	82.01%	378
Adjame	13.72%	3.92%	62.75%	19.61%	102
Yopougon	8.28%	1.48%	58.58%	31.66%	338
Abidjan	8.62%	4.43%	49.04%	37.92%	1717

- 1 Maintained by the Central Government
 2 Maintained by the City of Abidjan
 3 Maintained by the Commune.

Source: Dcgtx, Working Papers

5.3 Sources of Finance for Urban infrastructure

The finance of urban infrastructure has been plagued by its reliance on revenue from real estate taxation. The taxes allocated to infrastructure are levied and collected centrally by DGI. Despite high rates, the yield is woefully inadequate due to widespread evasion and dismal collection records. The city and the communes receive their share of the receipts earmarked for them through transfers credited to their account.

5.3.1 Water and Sanitation Works

Legislation authorizing and allocating resources for water supply and sanitation purposes has undergone numerous changes since the early '70's. The underfunded and heavily indebted "Fond National de l'Assainissement" which financed the construction and maintenance of sanitation works was abolished in 1987 and merged with the "Fond National de l'Hydraulique" to form the "Fond National de l'Eau". Resources for the new fund are generated from a fixed share of the water consumption rates, and it finances water supply works only.

Current revenues allocated for the construction and operation of sanitation works are derived from two taxes levied on built properties. The first is the state tax on built properties and the second a sanitation tax instituted in 1974. The current rate for both taxes stands at 10% of net rental value since the former was reduced from 20% to 10% in 1975 and the latter increased from 5% to 10% in 1980. Receipts fail to cover the most basic operation and maintenance costs. Understandably, priority is given to drainage. Sewerage works have consequently suffered from neglect. A case in point: 18 out of 20 small treatment plants servicing large institutional projects are at present inoperative.

5.3.2 Solid Waste Management

Resources for solid waste collection and removal were until 1972, generated through another real estate tax, the "taxe d'enlèvement des ordures ménagères", also collected by D.G.I. and transferred to Abidjan City authority. As with all property taxes, the yield was low and highly inadequate. It was repealed in 1972 as part of an effort to improve collection of real estate taxes by lowering rates. It was replaced by a tax on the consumption of water and electricity. The privately operated billing systems provided the most efficient and expedient mechanism for collection. Receipts are deposited with D.G.I. which transfers them to the city. The legislation setting up the taxes carried over a provision of the old tax enabling municipal authorities to levy a fixed fee on renters in buildings not connected to these services. It is unclear whether this clause was ever implemented, and given current institutional capabilities it is unlikely that it could be effectively levied and collected.

5.3.3 Circulation Network

Street paving and maintenance is financed through the tax for roads and sanitation. It was originally conceived as a frontage tax taking into account the number of stories in the structure. In 1975, the formula was changed to a flat rate of 0.5% on net rental value of built properties.

The City and the communes have no control whatsoever over resources generated through real estate taxes. They can only allocate the transfers they receive. This amount fluctuates sharply and erratically from year to year depending on collections, impairing their ability to develop a rational strategy for planning and implementing infrastructure improvements.

5.4 Issues related to Local management of infrastructure

Communes are responsible for the maintenance of the tertiary road system and part of the secondary network too. These responsibilities include:

- upkeep of sidewalks and pavements;
- street sweeping and garbage collection;
- weed control; and
- cleaning of open drain ditches.

Local technical services do not have accurate information regarding the classification of roads within their administrative boundaries. They are thus at a disadvantage in dealing with private operators of citywide services. They need to obtain from the responsible central authorities maps showing the roads for which Abidjan city is responsible and the roads covered under SODECI's and SITAF's contracts.

5.4.1 Water and Sanitation

The "Direction de l'Eau" (D.E.) acts as liaison between SODECI and the communes. Requests for SODECI's services have to be relayed through D.E. A weekly meeting is held at D.E. to report problems. D.E.'s issuance of a notification to SODECI constitutes a work order covered by the operation and maintenance contract. In both Yopougon and Adjamé, it usually took SODECI two to three weeks to respond to a service request depending on the backlog of cases. There are no procedures to handle emergencies. When serious blockages occur, the communes are compelled to contact SODECI directly. Direct requests are not covered by the contract. SODECI will act promptly within two or three days, but will require compensation for the service call. To meet an emergency in the upgraded areas, the commune is forced to pay SODECI for a service already covered by its contract.

The amounts involved are far from inconsequential to the commune. To unclog a manhole, SODECI dispatches a crew of three with a pumping truck, and charges 45,000 F. Adequate maintenance can quickly become an unbearable burden on municipal finances. This may explain the preference of local authorities for open drain ditches, despite the vigilance required to prevent misuse and the frequency of cleaning operations needed to remove accumulating sand and refuse obstructing the flow.

Abidjan's topography of highly erodible soils and substantial rainfall combine to generate a silt laden runoff which deposits sand along gutters and roadbeds downhill, clogging drains and damaging surfaces. At the edge of the upgraded sites there are locations where unpaved side streets aligned to the slope of the terrain are allowed to intersect with a paved road running along the contour lines. Businesses close to these intersections complain bitterly about dust, sand, mud, blockage of drains and pondage during storms. In parts of Abobo, paving has elevated the pavement above the floor level of houses. Residents complain of constant flooding of their yards during the rainy season.

5.4.2 Solid Waste Collection

Sheer housing density, the proliferation of informal activities and food vending stalls and the widespread peddling of produce generate a significant amount of garbage strewn all over the pedestrian and vehicular circulation space.

Businesses sweep the sidewalk in front of their premises, around displays of food and produce and vending stalls. Small and marginal informal activities can hardly be expected to invest in garbage bins. Households also sweep a space leading to the entrance door. The vast majority claim they cannot spare the money to buy garbage bins. Clearly those who can are mostly unwilling to do so. The only bins in evidence in the upgraded areas were found outside the premises of larger businesses who remit their "patente" tax to the State. The bulk of the refuse generated is not removed by SITAF. It is either conveniently swept over the curb onto the roadbed or thrown into open drain ditches. It washes down the gutter and ends up clogging the grate inlets of the storm water drainage system. Some garbage is carried to the dumpster, although it is often thrown outside by careless youths or children unable to reach the height necessary to empty their load into it.

Lack of pick up on weekends and holidays entails that exposed garbage could be left in bins or dumpsters for three consecutive days, a serious concern in a hot, humid climate. In parts of the project areas, putrid wastes are a nuisance and a hazard, generating noxious smells and attracting insects and rodents. Little wonder then that people forcefully object to the location of dumpsters with perpetual heaps of garbage in and around them close to their premises.

5.5 New Approaches integrating infrastructure, management, and local development

Communes lack the resources needed to adequately operate and maintain the infrastructure for which they are responsible. Administrative decentralization has allowed them to:

- set their own priorities for capital and operating expenditures, on municipal services;
- generate revenue to help cover some of the cost; and
- implement small scale works on their own.

Sanitation invariably ranked as the most pressing problem in the three communities. Given the economic hardships caused by the recession, local authorities feel that they can neither enforce regulations through coercion nor apply legal sanctions for violations. They have opted for experimentation with innovative approaches to deal with this intractable problem. Programs include:

- Sustained outreach efforts to sensitize residents to the hazards of unsanitary practices;
- Strategies promoting the organization of community groups to mobilize residents for concerted action;
- Formulation and funding of incentive programs; and
- Development of a capacity to generate resources locally.

5.5.1 Adjamé's creative initiative

Adjamé's experience is the most interesting and innovative to date. When the present mayor was elected in 1986, the deepening economic crisis made it perfectly clear that public resources would fall far short of urban needs. Attempts to improve health and sanitation in the commune would only succeed if affected populations actively supported the program and participated in its implementation. The mayor created an action group, the "Comité d'actions sanitaires et sociales" to implement programs for the improvement of living conditions in the commune. The committee's 25 members represented the political and social leadership and emphasized the interests and concerns of women and youths. 10 members were from the Association des femmes Ivoiriennes (AFI) and another 10 from the Union des Jeunes d'Adjamé (UJA). A good example of the committee's efforts is the street sweeping project for the main commercial artery and the immediate vicinity of the central market, a major generator of garbage and trash. The project was initiated in October, 1988. The team consists of 24 women to sweep the streets and collect the refuse - sweeping and cleaning is viewed as women's work - and 16 men to convey the collected garbage to the dumpsters and supervise the work. A bi-weekly contribution of 200 F is collected from each merchant in the market area. About 2000 businesses

pay regularly this remittance. Each team member can thus receive a monthly compensation of 15,000 F.

Attempts to replicate this project in the residential quarters including the upgraded areas have been less successful. The contributions collected from households simply fail to provide for adequate remuneration of team members. Workers willing to do the job understandably prefer the higher pay that can be earned with the market crews.

The committee's activities demonstrated the benefits of citizen participation but also brought to light the need for outreach at the neighborhood level. The creation of organizations allowing residents to assume responsibility for the improvement and management of their neighborhood seemed the best strategy for dealing with worsening social and environmental problems. To underscore this evolution and redefine its role as the support group for new grass roots organizations, the committee changed its name from "Comité" to "Groupement" (GASS).

Drawing on concepts and models observed in France and adapting them to the conditions prevailing in Abidjan, the Mayor established in 1988 neighborhood committees to engage the energies of residents for the promotion of social, economic and cultural development. The "Comité de développement de quartier" (CDQ). Their primary mission is social, focusing on the problems of youths. Since unemployment and poverty are the root causes of social ills and environmental degradation, the operational strategy is to spawn economic activities providing jobs for the unemployed. In many ways, CDQ provides a structure for the promotion of informal activities, "petits métiers", and their integration within a formal development program for the commune.

The structure of CDQ is interesting in that decision making is vested in the general assembly, policy formulation in the council of overseers appointed by the mayor and implementation in the executive board with 5 elected members and ex officio representation from local officials of GASS, AFL, UJA, the municipal council, and the party. CDQ's receive seed capital from the commune in the form of cash contributions and physical plant. The latter include privatized public facilities such as public latrines and fountains which can be operated at a profit and premises in mini bazaars built by the commune where small businesses could be started. These different micro scale economic units retain the income generated from their operations and should become self-financing. The sponsoring CDQ receives a share of net profits as working capital to fund new activities.

CDQ's have taken an active role in organizing teams to undertake badly needed sanitation tasks for a fee, and generating revenue to compensate them. They provide crews to pump out tanks in housing compounds, clean open drain ditches and sweep streets.

Today, 8 out of 18 quarters in Adjame already have operational CDQ's. Others are in the process of being organized. Should the experience prove as successful as it promises to be, it will be replicated in other communes throughout the country.

6.0 Overall Evaluation and Recommendations

6.1 Overall Evaluation

Urban infrastructure investment by its very nature is a contextual intervention. To evaluate a project in terms of broad criteria for cost reduction and replicability fails to recognize the more important longer term impacts that improvements in urban infrastructure can bring about. A project can neither be expected to change cultural attitudes nor social behavior. The shortcomings observed in Abidjan stemmed from institutional weaknesses at the central and local levels which impaired their utility to cope with urban dynamics responsive to factors far more complex and subtle than was originally anticipated.

Projects can and do bring about a new awareness of urban infrastructure as a valuable capital asset for the beneficiaries and the commune. They foster a greater appreciation of the economic and social contributions of the informal sector and can become an effective mechanism to regularize informal development and integrate informal activities. Indeed, the Abidjan projects have fulfilled these objectives.

Decentralization is a necessary precondition for perceptions to be translated into actions reinforcing the project's goal of promoting concepts of self sustaining urban development for lower income communities. Citizens must be informed and sensitized before they can be mobilized for cooperative action to improve their living environment.

In a context of dramatic decline in incomes, civil unrest and changing political structures, crisis management in the cities of sub-Saharan Africa is occurring within an evolving institutional framework for administrative decentralization. The city of Abidjan, which used to be divided into districts headed by appointed deputy mayors, now consists of a federation of ten communes headed by elected mayors.

The transfer of administrative powers and responsibilities to elected mayors and municipal councils is promoting a new sense of empowerment and accountability. Communes now can

- set their own priorities for capital and operating expenditures on municipal services;
- generate revenue to help cover some of the costs; and
- implement small scale works on their own.

They have opted for experimentation with innovative approaches to deal with intractable problems. Local programs include:

- sustained outreach efforts to sensitize residents to the hazards of unsanitary practices;
- strategies promoting the organization of community groups to mobilize residents for concerted actions;
- the formulation and funding of incentive programs; and
- developing a capacity to generate resources locally.

The local level is the pivotal node around which the interface between the formal and informal sectors can be structured. It is the effective platform for organizing and empowering citizens to take charge of their own living conditions. The development of institutions capable of engaging the informal sector requires the establishment of true public/private partnerships. Officials involved in this task must be responsive, supportive and accountable. The transfer of administrative powers and responsibilities to elected mayors and municipal councils has defined a framework within which this interface could occur.

Adjamé has taken the lead in structuring institutions capable of engaging the energies of citizens to protect the capital assets and nurture the human resources which can fulfill their aspirations. CDQ's are not true grass roots NGO's. They are controlled and closely supervised by the Commune. They lack latitude in decision making and discretion in budgeting. However they are a culturally adapted institution for partial and selective empowerment allowing people to express their needs, desires and choices, and giving them access to the resources which could enable them to participate constructively in the improvement of their own lives and their living environment.

Yopougon, facing different urgencies, is moving in the same direction by giving citizens a voice in setting priorities for expenditures and investments in the commune. Abobo may at some point follow suit.

The deepening recession will once again focus attention on small scale upgrading activities. It is a strategy that can only be conceived within an encompassing sociocultural context. It can be an effective institution building mechanism guiding local authorities towards a reformulation of their role as catalysts, coordinators and initiators rather than sole producers of public improvements. In the final analysis citizen-led, self-sustained improvement is the ultimate goal of infrastructure investment in lower income communities. The merit of the Abidjan projects is that they did make an important contribution to further this goal.

6.2 Recommendations

Defining infrastructure projects in terms of narrow physical and economic objectives and appraising their feasibility in terms of broad criteria for cost reduction and replicability fails to recognize their more important longer term impacts.

1. There is an urgent need to reformulate appraisal and evaluation criteria for urban infrastructure projects, one that recognize:
 - their value as generators of economic growth;
 - their contribution to strengthening the municipal tax base and shoring up revenues;
 - their role as effective institution building mechanisms guiding local authorities towards a reformulation of their role as catalysts, coordinators, and initiators rather than sole producers of public improvements.
2. There is also an urgent need to redefine the frame for the assessment of their economic feasibility. A pragmatic evaluation of institutional capabilities and weaknesses in the central/local interface would dispel unrealistic expectations regarding cost recovery within the boundaries of specific project areas through plot charges and user fees.

The development generated by improvements in urban infrastructure needs time to materialize the time lag needed for induced activities to get established and flourish is an important consideration since the economic cost of delayed benefits is high. The shape of the time stream of benefits and their incidence is a key determinant in the definition of an appropriate frame for project appraisal, geographically and institutionally. In Abidjan, this frame would be the commune rather than the neighborhood, keeping in mind that some benefits will accrue to higher levels of government.

3. Decentralization and enabling legislation are necessary preconditions to initiate constructive approaches to self sustaining urban development in lower income communities. The local level is the pivotal node around which the interface between the formal and informal sectors can be structured. It is the effective platform for organizing and empowering citizens to take charge of their own living conditions.

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Annex 1

LIST OF MEETINGS

Ministère de la Construction et de l'Urbanisme

S.E. Bamba Vamoussa	Ministre
Mr. Mambe Beugre, Robert	Conseiller technique, Cabinet du ministre
Mr. N'Gom	Directeur central de la construction et de l'urbanisme
Mr. Koua Brou, Issac	Sous-Directeur de la planification urbaine
Mr. Duquenne, Renaud	Conseiller Technique
Mr. Kessein, Kessein	Chef de service de l'urbanisme operationnel

Ministère des Finances

Mr. Ley, Albert	Conseiller, Direction de la Conservation Fonciere
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Commune d'Abobo

Mr. Ake Gerard, Lova	Maire d'Abobo
Mr. Gballou, Gervais	Secetaire General
Mr. Dongoh, Assanvo	Chef des services techniques

Commune d'Adjamé

Mr. Dembele, Lassina	Maire d'Adjamé
Mr. Soude, Antoine	Conseiller Municipal
Mr. Traore, Bakari	Consultant
Mr. Turquin, Jean Gabriel	Chef des services techniques

Commune de Yopougon

Mr. Doukoure, Moustapha Maire de Yopougon
Mr. Zagui, Adolphe Chef des services techniques

Direction et Controle des Grands Travaux

Mr. Sere-Eiffel Directeur General
Mr. Dugeny, François Directeur de l'atelier d'urbanisme d'Abidjan (AUA)
Mr. Nigon Ingenieur en chef, grands aménagements
Mr. Blumenfeld, Herve Architecte urbaniste, AUA
Mr. Clement, Pierre Ingenieur, Travaux publics
Mr. Koenig, Jean Directeur des ventes immobilières
Mr. Saint-Vil, Jean Geographe

Banque Mondiale/PNUD, Programme de l'eau et de l'assainissement

Mr. Locussol, Alain R. Groupe regional de l'eau et de l'assainissement
Ms. Manou-Savina, Annie Groupe regional de l'eau et de l'assainissement
Ms. Obeng, Letitia A Groupe regional de l'eau et de l'assainissement

RHUDO/USAID

Mr. Giddings, Stephen Directeur regional, RHUDO/USAID
Ms. Dei, Carleene Conseiller en habitat, RHUDO/USAID
Mr. Lebreton, Jean-Michel Coordinateur de formation, RHUDO/USAID

Annex 2

*IMPACTS SOCIO-ECONOMIQUES
DES INFRASTRUCTURES ROUTIÈRES
DANS LES COMMUNES D'ABIDJAN*

KIMOU Aya Maurice
ALLEBY K. Gustave

A. Synthèse

1. Impacts économiques
2. Impacts sociaux
3. Conclusion

B. Enquêtes

- 1-1 Commune d'Abobo: Quartiers Abobo Centre et Kennedy
- 1-2 Commune d'Adjamé: Quartier Liberté
- 1-3 Commune de Yopougon: Quartier Port-Bouet II
- 2 Tableau de répartition par commune et statut d'occupation