Managing the Monster

URBAN WASTE AND GOVERNANCE IN AFRICA

EDITED BY ADEPOJU G. ONIBOKUN

MANAGING THE MONSTER

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Urban Waste and Governance in Africa

Edited by Adepoju G. Onibokun

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE Ottawa • Cairo • Dakar • Johannesburg • Montevideo • Nairobi • New Dehi • Singapore Published by the International Development Research Centre PO Box 8500, Ottawa, ON, Canada K1G 3H9

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Canadian Cataloguing in Publication Data

Main entry under title :

Managing the monster : urban waste and governance in Africa

Includes bibliographical references. ISBN 0-88936-880-5

- 1. Refuse and refuse disposal Africa.
- 2. Urbanization Environmental aspects Africa.
- Environmental policy Africa.
 Onibokun, Adepoju G., 1943-
- II. International Development Research Centre (Canada).

TD790.M36 1999 363.72'8'6'096 C99-980242-9

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Chapter 2

Abidjan. Côte d'Ivoire

Koffi Attahi

THE PROBLEM AND ITS THEORETICAL BASIS

Today, the questions of urban waste management and, by extension, those of urban environmental planning and management represent some of the major challenges facing urban managers, as a consequence of their effects on human health, sustainable development, and urban finance. If, in the past, waste management in African cities has been perceived solely as a technical, organizational, and financial operation, today the realization is dawning that waste management has an important cultural dimension and gives leverage for power of the highest order.

In the Abidjan metropolis in 1994, the removal of some 500 000 t of household refuse, out of a total of about 920 530 t, consumed a little in excess of 5 billion XOF, or 61% of the city's

total budget (Table 1) (in 1998, 610.65 CFA francs [XOF] = 1 United States dollar [USD]). The amateurism of the contracted company, the frequent crises in the city's waste management, and people's overt or covert desire to partake in managing the substantial financial resources involved have attracted a number of new competitors for influence in the city's waste management. This has greatly politicized waste management, to the extent that a patrimonial system of management has been installed, overseeing both the visible and the hidden networks to the detriment of the quality of service. The appearance of new actors on the scene over the years has complicated the organization of waste management. Today, we have a hybrid system of management: although it lays claim to the techniques of privatization, decentralization, and recentralization, it has assembled actors from civil and political societies with ill-defined and often controversial responsibilities and very often maintains informal and noncontractual relations.

In this setting, it is illusory to attempt to use a classical approach to the analysis of the problem of waste management, with stress on description of structures, means, and results. The governance approach seems appropriate because it emphasizes the political analysis of the stakes, relations, and strategies of the various actors participating in the management system and applies the criteria of transparency, efficiency, efficacy, feasibility, and responsible participation, among others, in assessing performance.

It should be clarified that this study covers only three components of urban waste management: liquid waste, solid waste, and industrial waste. The management of liquid waste involves the

| Year | A Population | B Waste collected (t) | C Cost of collection and sweeping (XOF) | Expense per capita (C/A) (XOF) | Expense per t (C/B) (XOF) |
|------|-----------------|--------------------------------|---|---|------------------------------------|
| 1990 | 2 050 858 | 452 440 | 3 999 537 268 | 1 950.17 | 8 839.92 |
| 1991 | $2\ 143\ 240$ | _ | 4 142 777 642 | $1\ 932.95$ | _ |
| 1992 | 2 228 970 | 441 970 | $3\ 368\ 038\ 460$ | 1 511.02 | 7 620.51 |
| 1993 | 2 318 129 | 436 234 | 4 286 626 676 | $1\ 849.17$ | 9 826.43 |
| 1994 | 2 410 354 | 508 847 | 5 186 643 034 | 2 151.81 | 10 192.93 |

Table 1. Financial indicators of solid-waste management in Abidjan, 1990-94.

Source: Directorate-General for Technical Coordination, Abidjan, Côte d'Ivoire. Note: In 1998, 610.65 CFA francs (XOF) = 1 United States dollar (USD). evacuation and treatment of waste water of domestic origin: household water or sewage water (feces and urine) and industrial waste water (Table 2). The contractual agreement for the removal of household refuse distinguishes three categories of urban solid waste:

- All types of household refuse, ash, broken glass or crockery, and all sweepings and residues that are deposited in individual or collective dustbins placed in front of residences or along public roads;
- Residues from schools, barracks, hospitals, hostels, prisons, and public buildings, assembled in designated locations in prescribed receptacles; and
- Objects discarded in public places and carcasses of small animals.

According to the Classified Installations Inspectorate of the ministère d'Environnement (MOE, Ministry of Environment), which is responsible for industrial waste-management policy, there are two types of industrial waste:

- Industrial waste equivalent to household refuse: paper, plastics, canteen wastes, saw-mill waste, etc.; and
- Dangerous or toxic waste, including hydrocarbons, phytosanitary products, catalysts used in the petroleum industry, polychlorinated biphenyls, chlorine oxides, lead and arsenic used in the treatment of metals, and cyanide.

| | | * |
|--------------------|-------------|-------------|
| Nature of elements | 1994 (%) | 1987 (%) |
| Fines | 25.7 | 37.6 |
| Fermentescibles | 52.8 | 44.2 |
| Wood | 9.5 | 4.6 |
| Glass, stones | 1.2 | 1.1 |
| Minerals | 0.9 | 1.14 |
| Textiles | 1.3 | 1.0 |
| Paper, carton | 4.18 | 5.3 |
| Rubber | 4.7 | 1.0 |

Table 2. Composition of solid-waste in Abidjan, 1987 and 1994.

Source: Ministry of Environment, Abidjan, Côte d'Ivoire; CRI (1987).

A good reference study of the management of urban waste identifies four levels of intervention: planning, budgeting, execution, and control. Our analysis of each of the three main categories of waste will successively review

- The brief history of the management of liquid, solid, and industrial waste;
- The components of sectoral policies and management mechanisms;
- The actors and their responsibilities, the perception and exercise of these responsibilities, the competition for influence, the points of friction and their impact on the service rendered, the resources, and the results; and
- The evaluation of the management system in place and recommendations.

Before embarking on the actual study of the issue, however, it is pertinent to present the setting.

THE SETTING OF ABIDJAN

Data and physical constraints

Abidjan, the economic capital of Côte d'Ivoire, is situated in the south of the country, bordering on the Atlantic Ocean and straddling the Ébrié lagoon. The site of the city has four distinct morphological components: the coastal belt, the Petit-Bassam peninsula, the Ébrié lagoon, and the plateaux running from south to north over a distance of about 30 km.

The coastal belt is a sandy, low-lying zone linked to the sea by a beach washed periodically by huge dangerous waves, locally called the barrier waves. This zone is made up of sand deposits from the sea and is very marshy. Today, it accommodates the suburbs of Vridi and Port-Bouet and the airport. Its development entailed extensive sanitary work and drainage. The Petit-Bassam peninsula is made up of extremely marshy alluvial soil. This lowlying zone, where the water level is often less than a metre underground, is the location for the suburbs of Treichville, Marcory, and Koumassi. Prone to frequent floods during the rainy seasons, it has undergone extensive landscaping and drainage. But despite all these efforts, the risk of the spread of waterborne disease is very high.

The lagoon divides the city into two zones (North and South), linked by two bridges. It is a vast body of brackish water with a sandy and muddy bottom, varying in depth, and linked to the sea since 1951 by the Vridi channel. The lagoon, which has become the natural dumping ground for the greater part of the city's liquid waste, is very polluted. Its two bays, situated in the industrial zones of Brietry and Koumassi, receive the highest amount of effluent and are very poorly linked to the rest of the lagoon network. They have reached a very advanced stage of pollution, with the emission of nauseating odours.

The plateau zone, which stands out because it is higher than the other zones, presents two features: the lower-plateau zone bordering on the lagoon, where the suburbs of Cocody, Yopougon, and Riviera are located, and the high-plateau zone, rising up to 110 m, where the suburbs of Adjame and Abobo have been built. The plateau zone, which is better ventilated, offers a healthier environment.

The climate of Abidjan is influenced by four seasons: two dry seasons (from December to March and from August to September) and two rainy seasons (from April to July and from October to November). Temperatures vary very little, with a maximum of 32° in April and minimum of 28° in July. Abidjan is within the wettest zone of Côte d'Ivoire, recording an average of 2 800 mm of rain annually. Humidity is very high, with an average higher than 80%.

Land area, population, and socioeconomic data

Land area — Abidjan, created around 1912 along the Abidjan-Niger railway line, has undergone spectacular development, spread over three phases.

- In the first phase, which took place between 1912 and 1960, when Abidjan was a colonial city and harbour serving the old centre (comprising Treichville, Marcory, Adjame, and the Plateau), the city recorded an average growth rate of 12%.
- In the second phase, corresponding to the period when Abidjan acquired the status of political and economic capital of the new state of Côte d'Ivoire, the city consolidated

and modernized its structures, launched its expansion into the outlying areas, and recorded an average growth rate of 11% between 1960 and 1980.

• In the third phase, that of the economic crisis that began at the end of the 1970s, the city has experienced a sudden slowdown of expansion in area and population and has had an annual average growth rate of 4%.

The metropolis is a semicircle spread within a radius of 30 km on the waterfront and covering an area of 57 735 ha.

The town-planning workshop on Abidjan, in its atlas on the types of land occupation (DCGTx and AUVA 1990), differentiates five types of land use: natural spaces, urban land, human settlements, areas for human activity, and installations:

- Natural spaces These cover 36 003 ha, or 62% of the area of the metropolis, and make up 8 981 ha of the lagoon and 22 302 ha of undeveloped space (bushes, woodland, forests, plantations, water banks, embankments, and natural spaces). Land set aside for agricultural purposes (extensive agriculture) takes up more than half of the natural spaces, that is, 56.99%.
- Urban land This second type of land use covers 3 396 ha, or 5.88% of the metropolis, and comprises three distinct categories: allotted but unserviced urban plots, urban land serviced for human settlement, and urban land serviced for economic activity, particularly the industrial zones.
- Human settlements These occupy 5 652 ha, representing about one-tenth of the area, and this type of land use comprises four distinct categories:
 - Compound houses accommodate the majority (that is, 53.7%) of the inhabitants of Abidjan and cover 40% of the settled area; 90% of these dwellings are to be found in the populous neighbourhoods of Abobo, Adjame, Koumassi, and Treichville.
 - Individual households also occupy 40% of the settlement areas; these are scattered individual houses (19.7%) and grouped individual houses (20.3%).

- Blocks of flats take up 6.3% of settlement space; 4% of these flats have been constructed by real-estate companies; and 2%, by individuals.
- □ Unauthorized dwellings represent 13% of settlement area and shelter 16.4% of the urban population.

In all, 15.2% of the residential area, built on unplanned land, is difficult to reach by car and is serviced through the existing networks:

- Human activities These occupy 1 778 ha, or 4.9% of the city area; 67% of these spaces have been assigned to artisanal and commercial activities of a precarious kind.
- Installations These, excluding road networks, cover 2 825 ha; roads, which occupy about one-fifth of the city area, consist in total of 2 042 km of network, with 272 km of primary tarred roads, 940 km of secondary tarred roads, and 830 km of dirt roads.

Population and socioeconomic data — Abidjan currently has a population of 2.5 million inhabitants, spread over about 375 000 dwellings. The population of the city is very young, with 51% aged less than 20 years and 43% aged 20–45 years. The last population and human-settlement census (GOCI 1980) indicated that 3.2% of the city's population was living in individual homes (in groups or blocks); 26.7%, in blocks of flats; 53.7%, in compound houses; and 16.4%, in unauthorized settlements. The percentage of children in full-time education was 72% out of a population largely of new city dwellers. The average monthly household income was 76 920 XOF.

Management structures of the city

Since 1980, within the framework of the drive for the decentralization, Abidjan has been managed by 10 basic districts, which are divided into neighbourhoods and into 112 sectors. The mayors and municipal councillors elected in their respective districts are responsible for managing their local communities and exercising their authority according to the law on decentralization. This same law, which also established the city of Abidjan, has taken from these districts the control of a certain number of services considered "urban" or "regional" and assigned them to the supra-municipal structure. Notable among these services are public lighting; household refuse, sanitation, and drainage; road traffic; parks and gardens; slaughterhouses; fairs and markets; cemeteries; district roads, the enforcement of land regulations, town planning, and urban development; and the naming of roads, public squares, and buildings.

Although the city of Abidjan has, in theory, authority over these urban services, the enforcement of this authority, along with the management of markets, has always remained in the hands of the districts; the same is true of household refuse, the effective management of which is carried out by several institutional actors, to the extent of actually marginalizing the city of Abidjan.

Abidjan has the status of an urban community and functions according to the rules governing the districts. It is administered by the General City Council, which has 50 members elected for a period of 5 years on the basis of 5 grand councillors per district. The city mayor is elected by the 10 district mayors, who are required by law to choose one of their colleagues elected in the Abidjan metropolis. The winner immediately resigns his or her post as district mayor and assumes the new responsibility. The 10 mayors of the districts making up Abidjan are automatically deputies to the city mayor. Because the city of Abidjan is the economic capital and the showcase of modern-day Côte d'Ivoire, its development and management are handled by four types of institutional actors — the ministries, the city, the districts, and the actors from the civil society — despite the theoretical attribution of authority to the city. Faced with dwindling and insufficient resources and the emergence of other factors, the city authorities seem somewhat resigned. They continue to dream of a powerful city at the forefront of development but do not envisage any change in their roles.

MANAGEMENT OF LIQUID, SOLID, AND INDUSTRIAL WASTE IN ABIDJAN

BACKGROUND TO URBAN WASTE MANAGEMENT IN ABIDJAN

The organization of urban waste management in Abidjan has undergone a lot of changes in recent decades, owing particularly to the instability of the government team and the volatility of the executing agencies. In fact, each reduction or enlargement of the government team has entailed a redefinition of competencies and of ministerial organizational charts and very often the appointment of new persons to head the structures. Moreover, the institutional landscape for the management of solid and liquid waste has been greatly affected by the concentration of development studies and the monitoring of major state projects in the hands of a single structure attached to the President's Office and, later on, in the Prime Minister's Office. That unit is called the Direction et contrôle des grands travaux (DCGTx, department of major public works).

The management of liquid waste partly set in motion changes similar to those of World Bank projects in the 1970s and 1980s. At the end of the 1980s, when the sector for the management of liquid waste was emerging from difficulties with feasible management structures, the sector for solid-waste management confronted, in its turn, a crisis that persists to this day.

Liquid waste

In the early years of independence, the modest city of Abidjan had very little sanitary and drainage equipment. Most household waste water, drainage water, and industrial waste were disgorged into the lagoon. During this period, the rainy seasons, with their numerous floods in the low-lying and marshy areas of the Petit-Bassam peninsula and the coastal belt, were highly dreaded. The self-cleansing power of the Ébrié lagoon had been overestimated, and the lagoon was showing indications of advanced pollution. But it took the serious cholera outbreak of 1969 to force the authorities to draw up a sanitation and drainage policy. The two products of this policy are the Société d'équipement des terrains urbains (SETU, state land-development agency) and the Fonds national pour l'assainissement (FNA, national sanitation fund).

SETU, created by administrative order 71-672 of 29 December 1971, is a state-owned company under the dual authority of the Ministry of Economy and Finance and the Ministry of Public Works, Construction, and Town Planning (more recently renamed the MOE). Its purpose was to procure and service areas of the city through surveys and the execution of drainage and road works and the provision of network services (water, electricity, and gas). Another law, No. 75-95 of 31 December 1975, extended these functions to include the maintenance of the drainage network and other completed projects. At the same time, the FNA, fed by a 10%

tax imposed on net income from landed property, was instituted to meet the financial needs of the sector. Following on the heels of this, an emergency program (1975–78) and an extraordinary one (1977–82), amounting to 12.5 billion XOF, were launched to reinforce the existing equipment base and to create new infrastructure.

Funding from the United Nations Development Programme and the World Health Organization enabled the city to draw up a drainage master plan to establish a coherent approach within the sector. The plan opted for the construction of a system of primary and secondary collectors, making it possible to centralize the collection and marine evacuation of waste water of all types after preliminary treatment. Following the administrative reorganization of the waste-water sector, a central drainage project and the FNA assumed responsibility for partial funding of infrastructure and debt repayment. The FNA subsequently replaced the Fonds national de l'eau (FNE, national water fund). The latter was fed by a levy of 38.40% on the selling price of water, the total amount of drainage tax levied on landed property, state subsidies, and loans.

At the beginning of the 1980s, management difficulties undermined the smooth operation of the arrangement then in place. In fact, SETU was labouring under the weight of a debt of 9 billion XOF, of which 2 billion XOF was held by private purchasers of land; and 7 billion XOF, by national agencies. In 1986, SETU was dissolved, notwithstanding the reservations of the World Bank, and its functions were transferred to DCGTx.

In 1987, on the initiative and insistence of DCGTx, a new contract that linked the city's water department (that is, the newly created structure to replace the central sanitation department) to the Société des eaux de Côte d'Ivoire (SODECI, Côte d'Ivoire water company) transferred to SODECI the authority to collect the taxes on the sale and maintenance of drainage services.

The implementation of the objectives of the master plan is now complete; investments made in the city total 115 billion XOF. Abidjan has a drainage network of 2 000 km, with 640 km for liquid waste and 955 km for rain water, including 390 km of open drains; 140 km of single-drain network; and 45 special installations (pumping stations, pretreatment stations, depots). The main collector, measuring 22.6 km, was completed, with the construction of a 1.5 km outlet drain to the sea, equipped with a chimney. Today, 40% of the city's population has access to the sewerage system; 20% use septic tanks; and 26% resort to traditional latrines.

Solid waste

The history of solid-waste management in Abidjan covers three distinct stages:

- The period between 1953 and 1990, with management by a private company, La Société industrielle des transports automobiles africain (SITAF, private solid-waste operator);
- The period from 1991 to September 1992, when management was undertaken by the Waste Department of the city of Abidjan, with the support of the state; and
- The period from September 1992 to the present, with management newly ceded to a local private company, ASH International.

The SITAF period (1953-90) - Toward the end of the colonial period, when Abidjan was just an emerging city, it undertook its first experiment in privatization of household-refuse service. The city signed a concessionary contract with SITAF, a subsidiary of the French company, Société industrielle des transports automobiles (SITA, industry group for automobile transportation), specialists in the production of materials for the collection, transportation, and treatment of household refuse. This company later signed contracts to manage household refuse in other large cities in Africa. Under the contract SITAF was to undertake the removal of household refuse and sweep the principal streets of Abidjan. However, the SITAF contract, wrongly designated as a service concession contract, was more or less an arrangement with a state-owned company, as the city assisted SITAF to set up business and paid the company a fee for the services provided. In the event of a deficit, it helped the company to balance its accounts. This was also a long-term contract renegotiated every 5 years. The calculation of the monthly fee was based on a formula combining the tonnage of refuse transported and the distance covered, as declared by SITAF. Abidjan had not considered the possibility of monitoring the activities of its service provider. The whole arrangement therefore was based on mutual trust, until the beginning of the 1980s, when the newly elected mayor of the city, a shrewd, experienced businessman, began to express his anxiety and doubts about the escalating costs of the services.

Indeed, at the end of the 1984 financial year, the cost of household-refuse collection represented 39% of the overall budget and 58% of the city's operational budget. At the mayor's request, the government asked DCGTx to audit the operations of SITAF. The DCGTx team of auditors, after meticulously examining the collection routes and systematically weighing the tonnage of refuse collected through the year, concluded that the tonnages and kilometres declared by SITAF as a basis for the calculation of fees had been inflated over a long period. In other words, the service was overinvoiced. On the strength of these revelations, Abidjan, with the support of the experts of DCGTx, started to negotiate with SITAF, with the view to lowering the cost of its services. The new contract signed at the end of these negotiations retained as a basis for calculation the actual tonnage of refuse collected and dumped. It also saw the arrival of a third actor, the DCGTx acting as delegated supervisor to monitor the contract on behalf of the city. The DCGTx created its household-refuse unit and decided to maintain a weighing team on a permanent basis (day and night) on the weighing bridge at the dumping site. As a public service organization, it gave its service to the city of Abidjan free of charge. The impact of these new measures on the operations was immediate; indeed, from 47% in 1985, the costs fell to 40% in 1986, then to 33% in 1987, and only rose to 34% in 1988 (Table 3).

| Year | A Solid waste collected (kg) | B Cost of collection and sweeping (XOF) | C Budget of Abidjan (XOF) | Ratio <i>B/C</i> | Ratio (×10 ⁻⁷⁾ <i>A/B</i> |
|------|--|---|------------------------------------|---------------------|--|
| 1984 | 344 054 | 3 238 103 944 | 8 300 000 000 | 0.39 | 106 |
| 1985 | 408 243 | 4 475 077 416 | 9 600 000 000 | 0.47 | 91 |
| 1986 | $423 \ 921$ | 3 407 378 357 | 8 517 000 000 | 0.40 | 124 |
| 1987 | $430\ 234$ | 3 515 945 391 | 10 614 269 000 | 0.33 | 122 |
| 1988 | 481 517 | $3\ 526\ 344\ 080$ | 10 507 269 000 | 0.34 | 136 |
| 1989 | $482\ 279$ | $3\ 424\ 538\ 885$ | $8\ 674\ 460\ 000$ | 0.39 | 140 |
| 1990 | $452\ 440$ | $3\ 999\ 537\ 268$ | 9 239 340 000 | 0.43 | 113 |
| 1991 | | 4 142 777 642 | 9 415 700 000 | 0.44 | _ |
| 1992 | 441 970 | $3\ 368\ 038\ 460$ | 9 256 530 000 | 0.36 | 131 |
| 1993 | $436\ 234$ | $4\ 286\ 626\ 676$ | 8 507 483 000 | 0.50 | 101 |
| 1994 | 508 847 | $5\ 186\ 643\ 034$ | 8 451 603 000 | 0.61 | 98 |
| | | | | | |

Table 3. Economic indicators of solid-waste management in Abidjan, 1984–94.

Source: Directorate-General for Technical Cooperation, Adidjan, Côte d'Ivoire. Note: In 1998, 610.65 CFA francs (XOF) = 1 United States dollar (USD). SITAF, having been held in check in this manner, grudgingly accepted the new contract but did not give up. Under the pretext that its commissions were inadequate for the provision of goodquality service, it decided to lay off almost one-third of its maintenance personnel, thereby politicizing the issue. In fact, as a mark of solidarity for their dismissed colleagues, the staff of SITAF embarked on 3-day work to rule, during which they collected household refuse from only the principal routes of the city. The city, forced to resume negotiations, remained inflexible on the new provisions of the contract but, as a gesture of appeasement, agreed to undertake the cleaning of the streets.

Thereafter, SITAF lost interest in the business, feeling closely watched and under suspicion. During this period (that is, the end of the 1980s), the economic crisis worsened to such an extent that the state, on the verge of suspending payments, decided (in a fit of arrogance) to pay only the salaries of civil servants. The public treasury refused to pay the bills of national companies. Thus, SITAF, which occasionally found itself in 4–6 months' arrears on payments, became incapable of renewing its fleet of vehicles at the beginning of 1988. Faced with the prospect of a deterioration in its services, which would likely tarnish its image, the company decided to withdraw honourably and refused to renegotiate its contract on its expiry at the end of 1989. The city was unprepared for this eventuality, and it appealed to SITAF to stay on for another year while the city tried to find an alternative solution.

The city devised a three-party partnership with SITA and Chagnon of Montréal (a Canadian company), which in the long run enabled the city to get a hand in the business before buying out the shares of the two partners and then managing the business as an autonomous authority, vested with management organs and assigned its own budget. The Ivorian government, which in turn suspected the city of trying to repeat the game played by SITAF, rejected the partnership proposal. By the end of 1990, it was evident that the city was not prepared to lose SITAF. The mayor therefore left for Paris to renegotiate the contract, but the doors of the parent company of SITAF, SITA, were closed to him. He rushed back to Côte d'Ivoire to close the chapter definitively on the SITAF era.

The period of management by a stated-owned company (1991–92) — After abrogating the contract with SITAF, Abidjan decided to take up the challenge by providing cleaning services for an interim period, which was to last 21 months. To provide uninterrupted service immediately, the city bought up the equipment of SITAF. But because the average age of the acquired equipment was 12 years, breakdowns proliferated, and as early as November 1991 the city of Abidjan needed to partially replace the collection equipment. The choice was made to replace the tipper trucks (model 6000), which did 50% of the refuse collection. Contacts were signed with European manufacturers. But faced with the lengthy delivery periods (6-8 months) and very high costs, the city decided to contact Canadian suppliers. The Canadian suppliers proposed more efficient equipment at very competitive prices and easy payment conditions. The city ordered and received from the firm Chagnon, for 822.490 million XOF, six crusher trucks (24 m³), 3 fork-lift trucks for loading bins of 3-6 m³, and 360 bins of 3 m³. Immediately after, the city decided to procure French equipment. In this instance, the city ordered 10 reconditioned SITA 6000 tipper trucks to reinforce its collection capacity. When SITAF was operating at its peak, in June 1986, it owned 84 vehicles and machines, with a collection capacity of 1 606-1 700 t/day. After taking over the service in January 1992, the city council found itself with only 55 vehicles and machines, with a daily collection capacity of 1 090 t. The new acquisitions enabled it to achieve a total daily collection capacity of 1 763 t, with an increase of 1 050 t/day in the capacity of the equipment then in use (Table 4).

| Year | Population | A Waste generated (t) | B Waste collected (t) | Ratio B/A (%) | Waste generated per capita per day (kg) |
|------|---------------|--------------------------------|--------------------------------|---------------------|---|
| 1990 | 2 050 858 | 786 575 | 452 440 | 57.50 | 1.050 |
| 1991 | $2\ 143\ 240$ | 818 330 | _ | — | 1.046 |
| 1992 | $2\ 228\ 970$ | 850 815 | 441 970 | 51.94 | 1.045 |
| 1993 | $2\ 318\ 129$ | 885 125 | $436\ 234$ | 49.28 | 1.046 |
| 1994 | $2\ 410\ 354$ | 920 530 | 508 847 | 55.27 | 1.046 |
| 1995 | $2\ 507\ 288$ | 920 895 | _ | — | 1.006 |

Table 4. Performance indicators of solid-waste management in Abidjan, 1990-95.

Source: Directorate-General for Technical Coordination, Abidjan, Côte d'Ivoire.

It is worth noting that it was at this time that the householdrefuse crisis reached its climax. In 1991, toward the end of the year, the high rate of immobilization caused by the overaged vehicle fleet reduced the collection capacity to about 700 t/day. Faced with a proliferation of unauthorized refuse dumps and the indignant protests of the people, the state mobilized supplementary resources by approving a special grant, managed by MOE, and by requisitioning equipment and machinery from the ministry responsible for public works to carry out periodic refuse-collection campaigns. During this period, the state also sanctioned the arrival on the scene of partners in refuse collection.

In the face of the grave crisis, the President of Côte d'Ivoire, as a first step, requested the Prime Minister to take charge of the dossier on solid wastes in Abidjan. The Prime Minister set up a small crisis-management unit, bringing together the city of Abidjan, the Minister of Environment, the Ministry of Infrastructure, and the DCGTx, headed by the adviser to the Prime Minister responsible for projects and policies, with the mandate to assess the situation and recommend an appropriate solution. But to increase reflection on the crisis and involve all the other actors, the state decided to create a national commission for public health. The commission was created in 1992. But contrary to all expectations, its chairship did not fall to the MOE, which was already chairing the national commission on human settlements; rather, it was given to the Ministry of Interior, which clearly harboured the intention of playing an important role in the waste-management system. As the adviser to the Prime Minister responsible for the coordination of the activities of the household-refuse unit was at this time also performing the functions of Deputy Director-General of DCGTx, this structure progressively consolidated its position within the waste-management system.

Finally, this period also saw the start of precollection and collection activities by young school dropouts in the neighbourhoods. These people created small private or community enterprises for refuse precollection, thereby activating a link in the collection chain that had been dormant. These precollection structures received training from the household-refuse team of the Département d'Assainissement et d'Infrastructure (DAI, department of sanitation and infrastructure) of MOE, which had been reflecting on ways of reactivating this link. From the beginning of the crisis, the state had requested the DAI, the city of Abidjan, and the DCGTx to carry out a technicofinancial analysis of the system of household-refuse management and to propose some options for the decision-makers. The resulting study, entitled "A study of the management of household refuse in the city of Abidjan" (DAI et al. 1991), drew extensively on the data of a previous, more comprehensive study, "Master plan for the collection and disposal of waste in the city of Abidjan," prepared by a Canadian consultancy, Roche International (CRI 1987), with the support of the Canadian International Development Agency. DAI's study set efficiency against cost in the following three types of management:

- Management based on collection by crusher trucks (28 m³);
- Management based on collection by fork-lift trucks (32 m³), with loading bins of 6 m³ or 4 m³, with or without precollection; and
- Management based on combinations of the two types of trucks.

The data and options proposed in the ministry's study, which was completed in July 1991, provided a basis for defining a strategy for the collection of refuse in the city and for preparing tender documents for a refuse-collection contract.

Having learned a lesson from the monopoly operation of SITAF, the Ivorian authorities decided to put an end to all forms of monopoly and to encourage competition among various companies. Thus, the new scheme for refuse collection proposed by MOE and DCGTx divided the management system into the following eight sections:

- Five sections corresponding to the five geographical zones for precollection, collection, and transport, covering the city of Abidjan;
- One section for mechanical sweeping of the city;
- One section for the management of transfer stations and transportation to the dump; and
- One section for the management of the sanitary landfill.

These authorities also decided that each of the sections should be assigned to a specific small or medium-sized company, preferably a national one, to develop national expertise in the sector and contribute to the fight against unemployment.

At the close of the international tender, five companies had submitted bids. One of these was an international company of Nigerian nationality, Waste Management Ltd, with offices in Lagos and Abuja. When the bids were opened, it was discovered that only two of the five companies satisfied the solvency and bankguarantee criteria. The companies were

- Waste Management Ltd, to which the Tender Board recommended the allocation of five of the eight sections; and
- Enterprise de transport, construction, bâtiments et electricité (corporation for transportation, construction, trade, and electricity), an Ivorian company without any experience in waste management, but to which the three remaining sections were allocated.

According to some members of the Tender Board, this was an equitable distribution, as Waste Management Ltd, which won the larger part of the contract, had three major assets: experience, a partnership with an American company seasoned in waste management, and the requisite financial cover.

Contrary to all expectations, and as the members of the Tender Board were preparing to publish the results of the tender, instructions came from the Office of the President of Côte d'Ivoire to stop the process, declare the tender inconclusive (unfruitful), and offer the contract to ASH International, an Ivorian bidding company that had not even gone beyond the preselection stage. The instructions were automatically carried out, and the era of ASH began.

The ASH International period (from September 1992) — The award of the contract to ASH International did not surprise either Ivorians or international observers of the Ivorian political scene, as it was in line with the logic of the policy of "mercenary" support, actively pursued by the late President Houphouet Boigny, who never forgot his political friends in difficult times. In fact, one must recall that following the agitation for democracy in 1990, the regime of President Houphouet Boigny was seriously shaken by unprecedented protests. At the peak of the crisis, when he considered relinquishing power and seeking refuge in France, he received unexpected political support from a certain number of opportunist movements, one of which was led by Ahmed Bassam, the future boss of ASH International. All these movements, banking on the absence of a credible political alternative, the inexperience of the opposition leaders, and the anarchy into which the protest movements had thrust the country, took the risk of publicly supporting the President while calling on him to undertake the necessary political changes in an orderly and disciplined manner. Ahmed Bassam's movement, "I Love the PDCI" (Parti démocratique de Côte d'Ivoire [democratic party of Côte d'Ivoire]), had the unique characteristic of regrouping the fringe urban youth, composed mainly of school dropouts and the unemployed youth who had not benefited from favours of the regime but who had chosen to rally to its help. The youth movement openly denounced the hypocrisy and stereotypical language of their militant elders in President Houphouet Boigny's party, who for obvious reasons were hiding the realities in the course of the political power struggle in their regions or constituencies. The youth movement convinced the old President to entrust the organization of the elections to an emerging wing of the party that comprised innovators and youth organized in support groups. The initial movements sparked off others that progressively restored the political weight of President Houphouet Boigny, who won the election of 1990, using much fewer resources than in previous campaigns.

A new partnership agreement for the management of sweeping the major routes and precollection, transfer, control, and dumping of household refuse was prepared by DCGTx, MOE, and the city of Abidjan and signed by ASH International and the city of Abidjan in July 1992.

ASH International commenced work on 2 September 1992. Immediately after pocketing the contract and for reasons that are still unclear, the boss of ASH International decided to terminate the partnership with its American counterpart in the ASH group that had offered the indispensable international guarantee.

Convinced that one did not need any intensive technical know-how to manage the collection of household refuse, Ahmed Bassam set up a family enterprise of close to 2 000 persons, whom he loosely controls. Confronted with a sudden slump in refuse collection, as a result of very frequent breakdowns and poor use of equipment, the city experienced the worst crisis in householdrefuse collection, and tongues loosened to denounce the contract. Pressure was put on the city of Abidjan and MOE to denounce the contract and to abrogate it on the grounds of incompetence and noncompliance with its provisions. The major institutional actors rallied to the assistance of ASH International. On their advice, ASH International reduced its work force, recruited professionals, and signed a partnership agreement with the Canadian company Chagnon, which attached one financial expert and one city engineer to set up its accounting system and operational service.

Faced with these realities, Ash International was unable to organize the precollection stage and blamed the established precollectors, whom it accused of causing it financial losses by dumping part of the precollected refuse in ravines. The confrontation between ASH International refuse collectors and the precollectors led to the withdrawal of many precollection companies from these activities. Faced with this reduction in collection capacity, ASH International decided unilaterally to close the transfer station and to start moving the refuse directly to the dump at Akouedo.

The uncontrolled tipping of refuse on the dumping site led to its saturation and created environmental pollution in the village of Akouedo, where the football field became the manoeuvring area for ASH International's trucks. The village authorities requested the city of Abidjan to close the dump at Akouedo. They had already been alarmed by various epidemics, the pollution of groundwater, and the abundance of rats, flies, mosquitoes, and cockroaches resulting from the stoppage of the legally required sanitary treatment of the dumping site by ASH International.

To support their request, the villagers organized a sit-in on 4, 5, and 6 November 1994, which blocked the access of ASH International's trucks to the dumping site. The mayor of the city intervened to ease the crisis with the promise to satisfy all the main grievances, especially those regarding the rational use of the dump, the resumption of sanitary treatments, and the burying of biomedical waste. The state sent equipment from work sites to the dump to put it in temporary order. On the insistence of the city authorities, ASH International subcontracted the management of the dump to Y.P. Bejani. Following the failures of this company, the city of Abidjan suggested that ASH International subcontract the work to Motoragri, a state-owned company dealing with agricultural motorization and specializing in excavation works. Since February 1995 Motoragri has been the latest actor in householdrefuse management.

At the beginning of this year (1995), following the increasing unhealthiness of the city as a result of inadequate collection and elimination of household refuse, the Prime Minister gave instructions to the mayor of the city to carry out a financial and technical diagnosis of ASH International, with recommendations to improve its performance. A technical commission formed by the various partners, basing itself on the work and conclusions of two technical and financial committees, submitted integrated reports and recommendations at the end of February. The implementation of its recommendations has led to an improvement in household-refuse management.

Industrial waste

The first alarming signs of uncontrolled discharge of industrialwaste water into the lagoon appeared at the end of the 1960s, with nauseating smells and the impoverishment of the flora and fauna.

The service responsible for the inspection of dangerous installations was at the time tasked by the Ministry of Public Works, Construction, and Town Planning to find ways to limit and eventually neutralize the impact of industrial pollution. To tackle the pollutants at source, it began by updating its lists of industrial establishments that emitted pollution. But the Ministry of Public Works, Construction, and Town Planning, which at the time had the task of promoting industry, held the view that industrial pollution was a price the young nations of the Third World had to pay in the fierce competition to attract foreign investors. It therefore limited itself to a diagnosis of the problem and proposed some directives and exhortations. This lax attitude persisted until 1972, the year of the first Stockholm conference on the environment.

Indeed, the evaluation of the environment made within the framework of Côte d'Ivoire's contribution to the Stockholm conference, as well as the discussions that took place during the actual conference, helped to develop environmental awareness. The periodic appearance since 1973 of water hyacinths on the lagoon and the difficulty of combating this phenomenon have also strengthened environmental awareness and created a political will to preserve the lagoon and marine environment. In 1973, the service responsible for the inspection of classified installations, attached to the newly created Secretary of State for the Environment, fitted itself out to play an effective role, in collaboration with existing laboratories and research centres. In 1974, to generate resources to meet monitoring costs, it signed two administrative orders (Nos. N 74-525 and N 74-526 of 9 October 1974), setting out, respectively, the apportionment of inspection taxes on petroleum companies and the apportionment of inspection taxes on dangerous establishments. The Abidjan metropolis counted more than 60 industries producing dangerous or toxic waste, with 22 in the textiles and related sector, 14 in the chemical products sector, 11 in the cosmetics and detergents sector, 6 in the paint, glue, and varnish sector, 6 in the petroleum-products sector, and 5 in the phytosanitary-products sector.

The service responsible for the inspection of classified installations currently operates on the basis of the French texts of the regulations of 1926 governing unhealthy, inconvenient, or dangerous establishments. Indeed, the Ivorian law hastily passed in 1988 during the crisis in the transportation of radioactive waste from countries of the North to those of the South has not been followed by an enforcement order. The government has therefore not been able to abrogate the 1926 law. Consequently, the administrative orders and bylaws currently in force in France within the framework of the 1926 legislation are still applicable in Côte d'Ivoire. A committee is currently working to adapt this legislation to the Ivorian setting.

The collection and transportation of dangerous or toxic waste are not subject to official permit. However, the removal and transfer to the dump of dangerous or toxic waste that in principle should undergo pretreatment require the approval of the Service d'inspection des installations classées (SIIC, classified installations inspection service). This organization authorizes the transfer of waste to an appropriate storage area of the dump after ascertaining the admissible level of toxicity. Four specialized private companies namely, ASH International, SATD, Lassire, and CI Maintenance as well as other smaller transport companies, are active in the collection and transportation of industrial waste. Used oils and waste from the phytosanitary industry are treated locally.

Since October 1991 Centre ivoirien anti-pollution (CIAPOL, Ivorian antipollution centre) has been providing the necessary technical backup for the SIIC. Its central environmental laboratory is responsible for the systematic analysis of natural-water samples and the evaluation of pollution levels and other nuisances. A subsidiary company, tasked to be interventionist, monitors pollution in the sea and the lagoon to deal with accidental pollution through its rapid-intervention strategy, "the POLUMAR [pollution maritime] plan."

THE POLICIES, METHODS OF FUNDING AND MANAGEMENT, MEASURES IN PLACE, AND RESOURCES

If there is a sufficiently coherent management strategy for liquid waste, using a few dependable tools, the same cannot be said of solid waste, as the city is only just emerging from a grave crisis caused by the extreme politicization of solid-waste management. This section reviews the policies, financial tools and cost-recovery approach, and the legal technical means applied to three types of waste: liquid, solid, and industrial.

Liquid waste

The policies — After the emergency response necessitated by the cholera epidemic and to ensure coherence in infrastructure investment, the city adopted a drainage master plan and is continuing to execute it. It has completed major construction works for the primary collector and the outlet drain to the sea.

Methods of funding — In 1987, the government decided to merge all the financial mechanisms of the water sector into the single entity FNE. This fund fed from the drainage tax, the surtax on water sales, government subventions, and loans and is managed by the autonomous debt-depreciation office, a public financial organ managing public loans and state debt. Its resources help to finance the installation and maintenance of infrastructure in the water sector (including urban and rural water supply and drainage).

Management methods — MOE, which has competence in matters of drainage, has entrusted the maintenance of drainage installations (operation of treatment and pumping stations, etc., and cleaning out certain categories of gutters) to a private company, SODECI. The operational costs in 1995 amounted to 1.5 million XOF, which was to be paid by the FNE on presentation of the bills. Negotiations are in progress to transform the current operational contract into a lease contract.

The operation of the six sludge-dumping sites is handled by the city of Abidjan. The total receipts from monthly fees of 3 000 XOF per cesspool emptier that uses the dumps are not enough to cover the operational expenses, and MOE intends to integrate the operation of these dumps within the new lease contract with SODECI. The MOE is at the same time redoubling its efforts to regain management of the sites.

The legal and regulatory framework — Without a code on sanitation, the sector for liquid-waste management is organized on the basis of a dozen decrees and orders, notably the following:

- Administrative order No. 62-528 of 7 November 1968, fixing the supply, storage, and use of water resources in Abidjan;
- Bylaw No. 6616/CAB of 13 May 1968, setting out the modalities for the transfer to the Abidjan district of the water supply and distribution, as well as drainage installations situated on the territory of a commune and the water-distribution agency;
- Bylaw No. 4/SEM/DE of 29 January 1974, regulating the evacuation of water at car-wash bays;
- Interministerial order No. 4605/mtp of 31 August 1978, approving the provisions for drainage services applicable to the Abidjan metropolis;
- Bylaw No. 573/SP/CAB of 23 October 1985, relating to the creation and organization of a national public- and social-hygiene committee; and
- Administrative order No. 87-1472 of 17 December 1987, setting up a national committee for public health.

Human and technical resources — SODECI currently uses 15 trucks for cleaning out gutters. These trucks are equipped with vacuum pumps and operated by some 30 driver-mechanics.

Solid waste

The policies — A master plan for the retrieval and removal of the solid waste of Abidjan (CRI 1987) exists but has not been adopted. Nevertheless, this document and the study on the management of

household refuse in the city of Abidjan (DAI et al. 1991) have provided basic information for preparing a management strategy contained in the tender dossier for the allocation of the contract to manage solid waste in Abidjan. This strategy was not implemented because of political interference, incompetence, and the contract operator's lack of resources.

Methods of funding — A taxe d'enlèvement des ordures ménagères (TEOM, tax for household-refuse removal) is charged at 2.5 XOF per KW/h sold by the electric utility in Abidjan. This tax, created in the 1960s, has never been reviewed, and today it contributes a maximum of 1.5 billion XOF, whereas the operational costs of solid-waste management amount to 5 billion XOF. The rest is made up through the contributions of the 10 districts of the city, which add up to 3 billion XOF/year, as well as the global operational grant provided by the state, which varies between 500 million and 600 million XOF/year.

Proposals for a change in the rate and for reform of the TEOM have been refused by the government on the pretext that the fiscal pressure has been excessive, even though it has authorized the creation of a national television fee, based on the same electricity receipts over the same period.

Management methods — The provision of solid-waste service in Abidjan is assured by a private operator, ASH International, linked to the city of Abidjan by an agreement. By authority of a note from the Prime Minister, dated 30 October 1992, MOE, in conjunction with the DCGTx, monitors the execution of the contract. The service contract for last year (1994) amounted to 5 186 643 034 XOF to collect 508 847 t of refuse.

On the suggestion of the city of Abidjan, ASH International subcontracted the management of the Akouedo dump to Motoragri. This contract is in two parts: one part is related to the opening of tracts by the bulldozers, which generates 20 million XOF monthly, and the other part covers transportation of waste into the valleys, spreading of earth on the piles of refuse, and compaction, which pays at the rate of 1 419 XOF/t.

The legal and regulatory framework — Solid-waste management is regulated by a bylaw and two agreements:

 Bylaw No. 46/CAB-2 of 22 March 1954, concerning the removal of household refuse in Abidjan;

- The agreement of 24 July 1992 between the city and the firm ASH International for the management and operation of the public service, comprising sweeping of the principal routes and collection, transfer, and controlled dumping of household refuse in Abidjan; and
- The agreement linking ASH International to Motoragri for management of the Akouedo dump.

Human and technical resources — ASH International employs a total of 644 people, among them a managing director, a general manager, 2 deputy managers, 2 special advisers, 4 heads of service, 17 team leaders, 16 heads of cleaning sectors, 106 drivers, 231 refuse collectors, 58 loading-bin overseers, 25 mechanics, 8 inspectors, 14 commercial agents, etc.; 577 agents, representing 89.59% of the personnel, have very few qualifications and are assigned the tasks of sweeping, collection, and transportation of refuse. In February 1995, ASH International had a total of 93 machines and vehicles, with only 30 in working condition, that is, an immobilization rate of 67.74% and a theoretical collection capacity of 1 710 t/day. ASH International significantly improved this capacity after repairing 11 vehicles in April and acquiring some new trucks in July 1995. Because the amount of equipment in working condition is insufficient, it is overused. Indeed, the company operates a three-shift 24-hour service to collect the maximum of household refuse. The service is organized along 50 routes, equipped with 60 containers of 14 m³, 30 containers of 7 m³, and 300 containers of 3 m^3 (Tables 5, 6, and 7).

| | | Containers | | |
|-------------|--------|-------------------|-----------------|------------------|
| District | Routes | 14 m ³ | 7 m^3 | 3 m ³ |
| Port-Bouet | 3 | 5 | 0 | 57 |
| Koumassi | 5 | 3 | 0 | 25 |
| Marcory | 5 | 2 | 1 | 28 |
| Treichville | 5 | 6 | 0 | 20 |
| Plateau | 2 | 2 | 6 | 25 |
| Cocody | 7 | 7 | 6 | 35 |
| Adjame | 6 | 12 | 5 | 17 |
| Attecoube | 1 | 3 | 3 | 33 |
| Abobo | 6 | 7 | 4 | 27 |
| Yopougon | 8 | 13 | 55 | 33 |

Table 5. Distribution of routes and containers by district, 1993.

Source: Directorate-General for Technical Cooperation, Abidjan, Côte d'Ivoire.

| Structure of the fleet | Vehicles per category (n) | Vehicles in working condition (n) | Waste collected by category of vehicle (t) |
|------------------------|---------------------------------|---|--|
| Crusher truck | 28 | 16 | 960 |
| Fork-lift truck | 8 | 3 | 300 |
| Ampliroll | 7 | 3 | 300 + 120 |
| Tipper truck | 16 | 0 | 0 |
| Container vehicle | 5 | 1 | 30 |
| Lifter truck | 4 | 0 | 0 |
| Compactor truck | 9 | 0 | |
| Tractor | 7 | 3 | |
| Loader | 4 | 3 | |
| Grader | 5 | 1 | |

 Table 6. Composition of ASH International's operating fleet, February 1995.

Source: Directorate-General for Technical Cooperation, Abidjan, Côte d'Ivoire.

The company operates a site of 153 ha, opened in 1965, as an unrestricted dump. For the management of the dump, Motoragri has been assigned three bulldozers, two loaders, two graders, two compactors, four tipper trucks, two hydraulic shovels, and one bascule bridge.

Industrial waste

The policies — There is a coherent policy built around the objective of ensuring pretreatment at the source of pollution, as well as two important implementation mechanisms: the SIIC and CIAPOL. The SIIC monitors activities of polluting industries, and CIAPOL has the task of watching over the lagoon and the sea, systematically analyzing water samples, fighting pollution, and monitoring the enforcement of relevant laws, administrative orders, and national, regional, and international agreements for companies and ships.

Method of funding — SIIC is financed through the inspection tax on dangerous establishments. This tax, which varies according to the category and the surface area of the establishment, generated 380 million XOF in 1995, with a collection rate of 60-70%. The chief inspector thinks that this tax can generate more than 1 billion XOF if all dangerous establishments are classified and if the collection rate is improved. Theoretically, the three main actors share the proceeds of this tax according to the following predetermined formula:

• 70% is allocated to the national budget;

| | No | Availability rate | |
|---|---------------------|----------------------|------|
| Working | Under repair | Awaiting spare parts | (%) |
| Tipper truck 119 BS10 118 | B106 BS18 120 | 122 123 124 | 56 |
| Tipper truck 106 102 115 121 BS09 | 103 | | 100 |
| Crusher truck 604 603 605 T06 T01 602 | | | 100 |
| Fork-lift truck F01 | F02 | F03 | 33 |
| Ampliroll 501 504 | 505 | 503 502 | 40 |
| Container vehicle 405 402 | | 403 | 67 |
| Compactor truck 305 316 | | 312 315 | 50 |
| Lifter truck BP07 307 309 304 | | | 100 |
| Tractor 207 Tr03 204 | | 201 206 | * 43 |
| Loader 214 209 212 | | 211 240 213 | 50 |

Table 7. Characteristics of ASH International's fleet, 1994.

Source: Directorate-General for Technical Cooperation, Abidjan, Côte d'Ivoire.

- 25% is allocated to the common fund for technical and material assistance for the SIIC and CIAPOL; and
- 5% is shared, as a bonus, among the people on staff at the SIIC and CIAPOL.

Management methods — The inspectorate department for classified installations is a service attached to the Office of the Minister of Environment and Tourism, charged with development and enforcement of policies in this sector. CIAPOL, on the other hand, is a public-sector establishment created by administrative order No. 94-662 of 9 October 1991 and functioning as a national laboratory. In addition to ASH International, the private sector is very active in the management of industrial waste. We have, notably, three licenced small-scale carriers in this sector, handling the transportation of industrial waste to the dump, and five companies licenced to treat dangerous, toxic waste. Some of the waste that cannot be treated locally is transferred to France for adequate and appropriate treatment.

The regulatory and legal framework — The regulatory framework is essentially French in origin and not very well adapted to the Ivorian context. The most significant legal documents cover the following:

- Administrative order of 20 December 1926 regulates dangerous, unhealthy, or inconvenient establishments;
- The general bylaw of 28 April 1927 announces the implementation of the order of 20 December 1926;
- Local bylaw No. 3270, of 20 December 1932, organizes the inspection of dangerous, unhealthy, or inconvenient establishments;
- Administrative order No. 85-949, of 12 September 1985, concerns the organization of an emergency plan to intercept and ensure against accidental pollution at sea, in the lagoon, or in the coastal zones (the POLUMAR plan);
- Bylaw No. 0819 TP/MM, of 3 May 1968, concerns the pollution of water bodies, particularly with hydrocarbons;
- Law No. 88-651 is designed to protect public health and the environment against the effects of toxic industrial and nuclear waste and other harmful substances;

- Bylaw No. 38/MIP/DENT, of 28 June 1990, modifies the nomenclature of the administrative order of 20 December 1926, concerning dangerous, unhealthy, or inconvenient establishments; and
- Administrative order No. 91-662, of 9 October 1991, announces the creation of a public institution, administrative in nature, designated CIAPOL, and sets out its attributions, organization, and mode of operation.

Human and technical resources — The SIIC of the city of Abidjan has, currently, only 20 inspectors, with 13 based in Abidjan, 3 in Bouaké, 3 in Daloa, and 1 in San-Pedro. All the inspectors have secretariat service. The entire inspection department has altogether three microcomputers and four vehicles. The service usually seeks the collaboration of the police to enforce certain decisions.

THE INSTITUTIONAL AND POLITICAL CONTEXT OF MANAGEMENT

This section concerns the actors and their responsibilities, the perception and exercise of responsibility, the struggle for power, and its impacts on service delivery.

Actors, responsibilities, and power relations in the management of liquid waste

MOE — Liquid-waste management in Abidjan involves six main actors with, in principle, well-defined responsibilities. One of the most important actors is the state of Côte d'Ivoire itself, through the MOE. This department, vested with some of the tasks of the Department of Water Resources, is responsible for formulating and implementing policies. It manages SODECI's performance contract and monitors the company's activities on behalf of the state. In this capacity, the department checks the bills of SODECI before they are forwarded to FNE for authorization and payment by the accounts office.

This department also owns, on behalf of the state, all the equipment and drainage installations, although it entrusts the actual operation to SODECI.

SODECI — SODECI is a private company and a subsidiary of the huge French group Bouygues. It has contracts to supply water and

maintain the drainage network of the city of Abidjan. SODECI's services do not include cleaning up concrete gutters of district roads, an activity falling within the domain of the districts and households. It also does not manage the six sewage depots, which are operated by the city of Abidjan.

District authorities — The district authorities, represented by the city of Abidjan, manage the urinals, public toilets, and sewage depots. After some unfortunate experiences with public toilets in the city parks and small toilets built in selected areas, the districts are experimenting with some forms of management partnerships or outright privatization. The laxity of the management of sewage depots, noticed by the authorities of MOE, has compelled them to start thinking about integrating the operations of the drainage and sanitation installations in a new lease contract, under negotiation with SODECI.

FNE — The FNE has since 1987 been the financial organization responsible for the management of resources mobilized for the water sector. These resources partly serve to finance the drainage infrastructure and to repay the sector's debts.

Private cesspool emptiers — The operators of cesspool emptiers constitute a little known sector that is beginning to get itself organized. They do not represent a real political force, and their lack of cohesion makes it difficult to control their activities.

Households — Owing to the lack of awareness, as well as the inadequacy of facilities, city dwellers urinate and defecate in public parks and along the walls of isolated buildings and throw waste water into the street, instead of into drains. Landlords very often do not maintain the dry gutters and communal septic tanks used by their tenants.

Conclusion — The management of liquid waste is a modern wellstructured sector, in which people assume well-defined responsibilities and in which efficient management mechanisms are in place. The informal sector, however, controlled by the cesspoolemptier operators, needs to be better organized. The power relations between landlords and tenants favour the former, who refuse to fulfil their obligations. Unfortunately, sanitary officials, because of a lack of transportation, no longer carry out inspections. The direct management of infrastructural facilities by the districts has shown its limitations, and forms of indirect management are being developed.

Actors, responsibilities, and power relations in the management of solid waste

A dozen actors intervene in, or have an impact on, the management of solid waste. The state is represented by four institutional actors, and only two of these have responsibilities recognized in legal texts. The four institutions are MOE, the Ministry of the Interior, DCGTx, and the Ministry of Economy and Finance.

MOE — MOE, responsible for policies on public health, has, with the help of the refuse crisis, activism, and a sense of initiative, succeeded in carving a niche for itself in the chain of solid-waste management. Vested by the government with responsibility for mobilizing resources to organize selective operations in support of Abidjan's efforts in this sector and then later to propose a collection strategy, it has become the principal manager of the contract between ASH International and the city of Abidjan. It has also assumed the additional role of training the personnel of the precollection companies. Currently, it remains the preeminent actor.

Ministry of Interior — The Ministry of Interior has no official status in waste management. But the supervisory role it exercises over local governments has given it access to this sector. In this capacity it authorizes and stamps the major contracts linking the districts to suppliers or companies. Its chairship of the national commission on public hygiene consolidated the ministry's role, even though the commission has never worked.

DCGTx — DCGTx offers technical support to MOE in monitoring ASH International agreements. Its political influence has considerably diminished over the years, after the departure of its powerful Deputy Director-General from the Prime Minister's Office. This explains why the city of Abidjan is in no hurry to respond to DCGTx's new request for the payment of its services. The reason is the latter's diminished political clout.

Ministry of Economy and Finance — The Ministry of Economy and Finance, through its treasury services, is responsible for regularly meeting the city's financial obligations to ASH International. It has a crucial influence in the provision of services, as only the treasury can decide on the amount and period of payment, owing to the principle of the unity of accounts, which demands that the resources of the state, local government, and public institutions be lodged in the treasury. A second category of actors — the local authorities — comprises the city of Abidjan and the districts.

City of Abidjan — After creating additional services needed to manage (under a state-owned company) the household-refuse collection, the city is unhappy with playing the role of financier. Although it has no role in monitoring the agreement, the subdepartment for household refuse of the Department for the Environment, alongside DCGTx, provides weighing and monitoring services. It feels that it now has the means to monitor the agreement without recourse to any external body, not even DCGTx.

The districts — The districts are of the view that their compulsory contributions to the running costs of Abidjan are too high. Because the removal of household refuse is a municipal responsibility in the interior towns, the districts of Abidjan want to retain their contributions and carry out the task in their respective territories.

Other actors in the sector responsible for solid-waste management include ASH International, the precollectors, the households, the scavengers and recyclers, the Akuedo community (next to the Akuedo dump), and the Office of the Prime Minister.

ASH International — After the death of President Houphouet, ASH International, the company contracted for household-refuse removal, still enjoyed the hidden support of certain influential people in the Office of the Presidency, by way of respect for the memory of the former president. Subsequently, in the face of the gravity of the crisis and threats to suspend the contract, the company resorted to developing and maintaining a network of informers and key pawns, both within the circle of official actors in the system and in the high echelons of power, to eliminate, unilaterally and without concern for the consequences, two important links in the collection chain: the precollectors and the transfer stations. Despite the shortcomings of management and the persistence of the refuse crisis in Abidjan, ASH International is, surprisingly, competing for the contract for household-refuse management in Yamoussoukro. The majority of actors in the household-refuse collection chain today think that the situation has improved, following their mobilization to assist in the collection of household refuse on the recommendation of the Prime Minister. But nobody either in the city of Abidjan or at MOE expects a review or renegotiation of the contract with ASH International, on the grounds of noncompliance with any of its obligations.

Precollectors — The precollectors came on the scene because of the shortcomings of ASH International. They receive training from MOE and technical support from districts such as Yopougon, Abobo, and Koumassi that are responsible for issuing authorizations for this profession on their territories. Faced with the hostility of ASH International, the precollectors are forming associations to increase their negotiating power. But the associations confront many difficulties.

Today, the general association of household-refuse precollectors of Abobo, created in 1993 with 15 members, is down to 9 members. The Union of Pre-collectors of the District of Yopougon, created on 20 March 1991, has since 26 June 1994 become the Ivorian Organisation for Public Cleanliness, led by a director-general, instead of a chairperson as in the past. It brings together 15 companies employing a total of 70 people. Despite all these attempts to organize, the precollectors still lack the necessary credibility to gain the confidence of banks. Their ardent desire is to be recognized as partners of ASH International and be offered contracts by it. The negotiations are in progress.

Households — The households have no influence in the system. Indeed, despite their acceptance of the initiatives of the precollectors and their financial contributions, they are still not consulted by the central authorities. The central authorities see their role in relation to the households as one of creating awareness but do not see the households as effective participants in the system of government. It seems that the state, ASH International, and the districts hesitate to tread in areas where the precollectors have succeeded. Thus, the initiative to introduce refuse bags, undertaken unilaterally by ASH International in July 1995, did not receive a favourable response from households, even though the idea is laudable and householders really desire to contribute.

Scavengers and recyclers — The recovery network is not recognized or organized. A recent study (CFD 1995), financed by a French development fund, made it possible to estimate the number of scavengers at 800, with 280 operating at the Akouedo dump alone. They are not adequately equipped and are exposed to frequent fatal accidents, which no longer attract the attention of the public (scavengers are buried under the refuse or crushed to death by the bulldozers and trucks on the sites). The study also brought into relief the economic importance of retrieval and recycling in the metal and plastics sectors of industry. The study insufficiently emphasized the serious risks posed by the uncontrolled resale of retrieved products to consumers (households). As a result of this study, a law is being examined to regulate the management of refuse dumps.

Akuedo community — Akuedo, the village community situated next to the dump, has on two occasions demonstrated its power by blocking access to the dump when the community felt it was necessary. After the last crisis, an ad hoc committee on the dump was set up, with representatives from the city of Abidjan, the Ministry of Health, MOE, ASH International, and Motoragri. The excavation works and the work on opening lanes, which have now been completed, have reduced the tension. The new project for the development of the dump, proposed by the committee, is being examined. This will lead to the specialization of the quays and eventually to controlled dumping.

Office of the Prime Minister — The Office of the Prime Minister intervenes only in the event of a crisis and to coordinate ideas and settle differences about sharing and meeting responsibilities.

Actors, responsibilities, and power relations in the management of industrial waste

Industrial-waste management involves three main actors with well-defined responsibilities:

- MOE, represented by the SIIC, is responsible for developing and implementing policies. Its main task is tracking all dangerous establishments operating in the country and monitoring the extent to which their activities are conducted in accordance with the law. Finally, it is charged with the evaluation and billing of the inspection tax on dangerous establishments.
- The second actor is CIAPOL, which carries out the function of the central laboratory for the Inspection Department and the private sector.
- The Ministry of Finance is responsible for collecting and sharing the inspection tax. Faced with financial constraints, this ministry is unwilling to honour the dispositions of the sharing formula. As a consequence, the poorly equipped SIIC cannot satisfactorily discharge its responsibilities. The chief inspector contends that more than one-third of dangerous establishments are still not classified.

EVALUATION OF WASTE MANAGEMENT IN ABIDJAN

The evaluation of waste management is done according to the type of waste: liquid, solid, and industrial. Keeping in mind the four levels of intervention — planning, budgeting, execution, and control — I systematically evaluate the main elements, particularly the policies, methods of funding and management, the legal and regulatory framework, and human and technical resources. This evaluation is based on the criteria of good governance particularly transparency, efficacy, efficiency, feasibility, and the participation of, and respect for, the rights of city dwellers.

LIQUID WASTE

In the sector responsible for liquid-waste management, a coherent policy has been defined within the framework of a drainage master plan for the city. To accelerate private connections to the network, SETU launched a campaign of social connections and enabled 1 550 low-income landowners in residential areas to link up to the drainage network. Unfortunately, despite the success recorded, the campaign has not been repeated, owing to management difficulties and the premature abolition of SETU. The system of funding and infrastructural cost recovery, based on receipts from water sales and lodged in the autonomous treasury, is a feasible and flexible arrangement.

The management chain comprises very few actors, and the responsibilities are well defined. The main operator, SODECI, is highly motivated and has adequate equipment and qualified staff. However, a few cloudy areas exist in the system:

- The private cesspool emptiers' sector is still not formally organized and is, consequently, little known and difficult to monitor.
- With the decline in the frequency of home visits by sanitary inspectors, many owners of compound houses no longer carry out their responsibilities of emptying their septic tanks. This creates a nuisance for the tenants.

- Insufficient toilets and urinals in working condition and open to the public, coupled with the absence of urban culture and the inadequacy of awareness campaigns, have left many city dwellers with no other choice but to defecate and urinate in inappropriate places in the city.
- The management system for sludge-dumping stations is not feasible; and
- The majority of public or private operators of public toilets encounter difficulties in technical and financial management.

SOLID WASTE

Drawing on the lessons in refuse management during the period of SITAF, the Ivorian authorities equipped themselves with the elements of a refuse policy for the city of Abidjan during the interim management period under a state-owned company. Unfortunately, rash intervention by politicians prevented the implementation of some of the principles and components of this policy.

There are too many actors in the chain of household-refuse management. Their responsibilities are poorly defined and sometimes challenged. Currently, the city of Abidjan, which is supposed to be at the top of the chain, appears marginalized. The city questions the active role of MOE and DCGTx. A general malaise hangs over relations among the actors.

The monopoly position of ASH International, a deviation from the new policy, gave it a strategic position of financial power, enabling it to organize its political survival. This company, the principal operator, has very little experience in the sector and works with old equipment that is insufficient and overused. The absence of a maintenance culture (building up of spare-part stocks, routine maintenance) accounts for a high immobilization rate of the fleet (see Table 7). Despite the provisions of the policy in force, the company has made no effort to integrate the precollectors and the scavengers and recyclers into the collection chain. The proposed sanitary landfill is not yet in place. The households, which are barely consulted in decision-making, have developed an apathy, which explains the failure of the recent initiative to introduce household-refuse bags. The legal and regulatory framework has become obsolete, and the system of funding has become outmoded and incapable of covering the costs of the sector.

INDUSTRIAL WASTE

Although the legal and regulatory framework in force in France and adopted by Côte d'Ivoire is irreproachable with regard to norms, it needs to be adapted to the specific realities of the Ivorian context. An industrial-waste policy is partially in place, with clearly defined responsibilities for the actors and an adequate financing mechanism, but this policy is not fully implemented and does not take account of the waste generated by the informal sector (tanneries, jewellery manufacture, artisanal dyeing) or that created by used nonrecoverable industrial products (scrap yards, abandoned garages, etc.). The absence of incinerators in the hospitals, the closure of treatment stations for used water in hospitals, and the nonimplementation of the policy of sanitary landfill pose serious problems for the management of medical waste. The absence of regulations for the collection and transportation of industrial waste comparable to those for solid waste (rubble, sawdust, cartons, papers, etc.) and inadequate monitoring encourage the development of unauthorized dumps. The two main executing agencies lack material and financial resources. Indeed, the proceeds of the inspection tax are not fairly shared.

RECOMMENDATIONS

A laudable effort has been made to develop management policies for the three areas of waste in Abidjan. However, the weaknesses in these policies, especially with regard to industrial waste, must be corrected. The policy options must be applied without undue interference from politicians. Feasible funding mechanisms and costrecovery measures must be developed on the model of the FNE for solid wastes.

The sharing formula for the proceeds of the inspection tax needs to be reviewed, with a view to allocating more resources to the SIIC and CIAPOL. The state and local authorities should disengage themselves from the delivery of services and concentrate their efforts more effectively on planning and monitoring. The obsolete legal and regulatory framework of the three components of urban waste must be revised to take account of all types of wastes generated and the specific context of Côte d'Ivoire. The institutional framework, particularly that of solid-waste management, must be reviewed, with a view to reducing the number of institutional actors and to clarifying their responsibilities. The institutional actors and the operators and managers ought to integrate the views of city dwellers into waste management; in this connection, a participatory approach should be introduced. Finally, simple technical- and financial-management mechanisms must be made available to small-scale operators of equipment and providers of sanitation services.