

ANNEX N

*Institutional Improvement
Proposals for the Implementation
of the USE M/P*

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N Institutional Improvement Proposals for the Implementation of the USE M/P

N.0 Summary of Institutional Aspects

MUNICIPALITY IMPROVEMENT
<p>Granada, Leon and Chinandega have similar USE problems, although they vary to a different degree. Thus, the following general concepts should be applicable to all the municipalities. <u>The official organizational structure do not express some functions that are requested and then assumed by high level officials or the Mayor, taking their precious time; other functions are not leveled according to their actual importance; and new functions have to be added or improved in order to perform new attributions proposed in the Study.</u></p> <p>The currently available human resources must be trained to accomplish the old and new tasks.</p> <p>Norms should be enforced by a Municipal Ordinance (MO), clearly establishing the municipal authority, including its ability to penalize defaulters. The municipality should provide standards and simple technical instructions for citizens to understand.</p> <p>Better services and feasible fees would encourage the citizens to pay and thus supporting the maintenance services, as waste collection and disposal.</p>

OBJECTIVES	ACTIONS	RULES	SUP-PORT	ASSIST-ANCE	ANNEX
To improve the municipal organization and its human resources	To reorganize the organizational structure progressively and in accordance with fixed targets and schedules. To enhance personnel skills at managerial and operational levels.	New structure approval by MO.	O. m. b.	O&M&T adviser. INIFOM	Vol. IV: Fig. N-1to6 Item N.4
To improve the municipality's regulatory power and define its duties on USE matters.	To regulate the USE sector and enforce regulations set in the MO on the following matters: • SWM (all aspects) • microdrainage system • wastewater discharges.	The MO related to the USE sector, observing national regulations and authority	O. m. b.	Judiciary and INIFOM	Vol. IV: Table N.7-1
To direct and assist the citizens	To prepare technical instructions on municipal services and <u>official demands</u> , as well as on water, WW, vermin control and sanitation, in order to make them easily understandable to the average citizen.	Instructions, observing municipal and national regulations	O. m. b.	Judiciary Municipal directors. INAA MINSA INIFOM	Vol. IV: Table N.7-1 Item N.6
To establish self-sustainable USE services	To revise the tariff system pertaining to USE services (solid waste, drainage, <u>street pavement</u>) considering: (1) the citizen's economic capabilities and willingness to pay, (2) the level of services and their costs. The Cadastre (of the Municipal Planning and Projects Bureau) will play an important role in its assistance.	The MO establishing the fees.	O. m. b.	Judiciary Municipal directors.	

Note: MO: Municipal Ordinance
O&M&T: Organization and methods, and personnel training
O. m. b.: Ordinary municipal budget.
WW: Wastewater

MUNICIPAL SOLID WASTE MANAGEMENT (MSWM)

The sector is managed by a department without a sound organizational structure; it has no operational or costs control.

The MSWM sector must be reorganized and provided with skilled personnel at managerial and operational levels.

There are no regulation for users or providers of services, and the municipality does not have a legal basis to punish those that violate its USE laws. A high percentage of users do not pay for services, resulting in the loss of revenue.

The basic conditions required to monitor and manage a large-scale privatization of MSWM services are non-existent.

OBJECTIVES	ACTIONS	RULES	SUP- PORT	ASSIST- ANCE	ANNEX
To improve the management capability	To organize the Department of RC&PC. To enhance the human resources available. To emphasize planning and control of MSWM services.	The MO approving the new organizational structure	O. m. b.	O&M&T adviser	Vol. IV Fig N.6
To set the responsibilities of both the beneficiaries and providers of SWM services	To <u>elaborate</u> Regulation for SWM. To submit the Regulation with the approval of the Municipal Council through an MO.	MO	O. m. b.	O&M&T adviser	Vol. III Items: 4.5.3 4.5.4
To improve the USE conditions of urban fringe areas	To implement a point collection system, that requires citizens' cooperation. To motivate and get the beneficiary communities to provide a labor force, and their commitment of paying services. <u>To emphasize the implementation in the Model Community.</u>		O. m. b. Fees and penalties. Equipment granted.	MINSA (for community relations)	
To initiate privatization under specified conditions and monitoring conditions	To establish a monitoring system for private services, terms of reference and contacts. To contract out the maintenance of vehicles and machines. To start contracting out SWM services as an auxiliary service. To register and authorize private companies to collect and dispose of medical and industrial wastes.	Term of reference and contract models. Instructions for medical and industrial waste management, by MINSA and MARENA	O. m. b. Fees and penalties. Direct payment from medical institutions and factories to services providers.	INIFOM MINSA MARENA	

Note: RC: Refuse Collection
PC: Public Cleaning

DOMESTIC WASTEWATER (DWW)

INAA is responsible for water supply and wastewater treatment, and has planned (base on a feasibility study) the extension of WW collection and treatment. The extension does not includes some peripheral areas, and the present Study proposes on-site treatment for these areas, starting with a Model Community in Granada. A special program (PECM) is proposed for this Model Community, which is also intended to be a model for Leon and Chinandega.

OBJECTIVES	ACTIONS	RULES	SUP PORT	ASSIST ANCE	ANNEX
To improve the efficiency of the sewer system	To enforce connections to the existing sewage pipes, from residential and non-residential buildings	The MO enforcing the connections	O.m. b. Penalties	INAA	Table N.7-2 N.7-3
To implement local collection and treatment systems in areas non included in INAA's plan	To organize a joint-venture among INAA, MINSAs, and the municipality in order to secure capital and implement the PECM. To establish the steering committee for the PECM.	Convencione INAA - MINSAs - Municipality.	INAA's fiscal budget	INAA - MINSAs. O&M&T adviser	
	To accomplish the formal needs for obtaining a finance for implementation of the PECM.	International standards	INAA's fiscal budget	INAA - MINSAs INIFOM	Vol III 5-10 to 5-13
	To initiate and develop the PECM as follows: <ul style="list-style-type: none"> • select potential communities for the project • develop community relations aiming to achieve commitment by the community to participate in the project • evaluate the feasibility of communities to join the PECM and select the first group of communities to participate • executive the project: i.e. design, construction, operation, maintenance • account, audit and report the investment evaluate end report the enterprise.	Internal rules of the steering committee	INAA's fiscal budget. Grant for PECM.	INAA - MINSAs	

STORMWATER SYSTEM

The stormwater collection system is very insufficient, and most of it runs off on unpaved roads.

Wastewater and stormwater often drains through the same channels, thus placing a heavy burden on the sewage network and disturbs the biological treatment processes in lagoons.

There are specific responsibilities on macro-drainage, i.e. channels, streams and basins; and the municipality does not have the finances nor technical resources to manage it.

The present Study proposes surface drainage on paved streets, to be implemented together with the WW program in the Model Community.

OBJECTIVES	ACTIONS	RULES	SUP-PORT	ASSIST-ANCE	ANNEX
To improve the municipality's ability to manage stormwater systems	To reorganize the Public Constructions & Maintenance Department (of Public Works and Services Bureau). To enhance the human resources.	The MO approving <u>the new structure</u>	O.m.b.	O&M&T adviser	Vol IV: Fig N-5 Item N.4
To share responsibilities on drainage maintenance	To study a rational classification of micro- and macro-drainage systems, in the municipal boundary. To propose a division of responsibilities with a state authority.	Agreement	O.m.b.	MARENA INIFOM	Table N.7-4
To prevent the mixing of stormwater with WW. To reduce WW discharge onto the ground and unpaved streets. To reduce the number of vermin.	To enforce a regulation on WW discharge.	MO	O.m.b.	INAA MINSA	Tables N.7-2 N.7-3
To drain the stormwater where there are no sewage system	To implement the necessary changes in conjunction with the on-site DWW treatment program, under the PECM. NOTE: the Urban Maintenance Department (of Public Works and Services Bureau) would be the executing authority.	As presented for DWW PECM	O.m. b. Grant for PECM	INAA MINSA	

N.0.1 Reorganization of the Municipality

The municipality must be strong to provide services by its own means, with an adequate organizational structure to be undertaken by skilled personnel.

Schematic diagrams for the proposed institutional reform aim to improve the USE in the three principal cities. It is inevitable that specific conditions and recent organizational improvements will lead to small changes; these diagrams are applicable to each municipality, accordingly, but they share the main directives, that are listed below:

- the duties are distributed among no more than four directors, thus allowing the Mayor and the cabinet/staff to oversee its administration. This will enable the Mayor to interact with the residents and develop a political relationship.
- MSWM (Public Works and Services Bureau, Urban Environmental Maintenance Bureau), planning and implementation of projects (Municipal Planning and Projects Bureau), and auditing (Administration and Finance Bureau) are to be the responsibilities of different bureau directors, thus bringing departments with interrelated functions together.
- innovative key-functions for the USE and organizational structure improvements of the municipality (i.e. the Departments of Private Construction Assistance, Low Income Settlement and Housing, Planning and Control of Refuse collection and Public Cleaning), are put in evidence as department or section.
- key-functions are displaced aiming to support integration with main departments for the improvement of USE (i.e. Cadastre Department, Vehicles and Equipment Department).

Certainly a preoccupation does exist on costs increase and disturbs in the routinary activities during a reorganizational process, but the following aspects should be considered:

The duties considered in the new structure currently exist informally as demands, and citizens often request the attention of the Mayor or a high ranking official to assume the role of the directors; the time spent assuming these roles inevitably incur additional costs, that should be a credit for the new structure. New demands have as objective the USE improvement and the costs increase is related to the increase of skilled persons for the new structure, and to the personnel training. The personnel needs are considered in the feasibility study.

The supposition is that any organizational reforms may disturb the current activities, if it is unplanned and unsupervised. In order to minimize costs and disruptions as well as maximize the efficiency, we recommend the following strategy for the implementation of the new structure:

1. The municipality should hire an advisor to plan and assist the reorganization of the institutional system, introduce new administrative methods and personnel training.
2. Shape the next structure according to the next target; the structure must be filled with skilled persons to reach an improved organization, that will being done in

step with the USE improvement. Non-essential reforms should be postponed for now.

3. Introduce the institutional reforms with minimal disturbances in the current activities - this is the main objective of the plan. Appoint heads of bureaus, directors and chiefs of the new departments, explaining the directives and "specialized information" of their duties and obligations; they should be actively involved in the selection and training of their subordinates and personnel.
4. Start new operational tasks or operational fashion only when a small team of sufficiently skilled personnel are formed to initiate the improvements, in order to maintain an optimistic climate for the changes.

N.0.2 Enhancement of the Human Resources

The enhancement of human resources is an ongoing process, but requires specific targets and schedules to be managed. The enhancement must be progressive and scheduled according to the targets; its contents should be specified for different duties and trainee levels. The following suggestions for the enhancement of the human resources:

Table N.0-1: Human Resources Enhancement Recommended Priorities

LEVEL	TRAINEE	BUREAU	DEPARTMENT	SECTION
Specialized information	Managers	MP&P	Real Estate Cadastre Urban Development Private Construc. Assist.	
Technical training	Operational employees	MP&P	Urban Development Priv. Construc. Assist.	Zoning and Soil Use Low Income Settlement and Housing House Building Instruction Pre-Approv. Hous. Design Com/Ind Build/Inst Instruc Permit Emission Inspect. & On-site Assist
Managerial training (objectives and criteria, operational and costs control, employees motivation)	Department officials	UEM	Refuse Col. & Public Cleaning Vehicles and Equipment	
Operational training	Employees	UEM	Ref. Col & Public Cleaning Vehicles & Equipment	Planning & Control Refuse Collection Refuse Disposal Vehicles Maintenance Equipment Mainten. Garage & Distribution

Note: MP&P: Municipal Planning and Projects Bureau
UEM: Urban Environmental Maintenance Bureau

Enhancement of the human resources would be led by the already recommended advisor for Organization and Administrative Methods and Training, with INIFOM being strongly involved. It would be practical to take the opportunity of utilizing the existing training programs and the subsidy of a special one by national and foreign organizations.

N.0.3 Financial Resources

Maintenance of the USE conditions must be supported by the beneficiaries: citizens and the economic activities in the municipal territory, paying the related taxes, with transitory or permanent subsidy from other municipal income. The subsidy is justified because the broad concept of USE comprises very important municipal activities, as those related to solid waste and drains.

Feasible fees are suggested in this Study and must be legally instituted, starting to be collected right after each service improvement.

In order to be more effective the incomes, the fees on solid waste services would be charged together, in an only document, with water supply.

Since the maintenance could be self-supported, the investment required for equipment and construction would be granted by a national or foreign entity.

N.0.4 Normative Structure Required for USE Improvement

The Law of Municipalities gives competence to the municipalities on MSWM and urban drainage, and non-exclusive competence on general USE aspects. On this basement, the municipalities must establish their own regulation on MSWM and micro-drainage, and regulate aspects of strict municipal interest on USE, but conform with the state regulation.

Municipal Ordinance are recommended on the following subjects:

- municipal solid waste;
- micro-drainage system (highlighting effluents discharges)
- urban zoning and land usage (including low-income settlement)
- private building (comprising residential and non-residential, highlighting low-income housing and property cadastre)
- wastewater discharge - conform with INAA's regulation (highlighting connection to an existing sewer)
- medical solid waste - conform with MINSAs and MARENA
- industrial solid waste - conform with MARENA.

The Municipal Ordinances have to: (1) fix the attributions of the municipal authorities and their competence to punish infractions; (2) establish the minimum civic procedures and the penalties to citizens infractions; and (3) related matters.

The Mayor will make operational the ordinances through regulation and guidelines for citizens and for officials and public servants.

Beside this, municipality would perform its role of citizens assistant, mainly through the Private Construction Assistance Department of the Municipal Planning and Projects Bureau, expressing the most useful state regulations in simple and accessible instructions for citizens understanding and use.

As the MSWM is the main municipal attribution related to USE, it will be very useful to arrange the concepts and precepts on SWM in a code or regulation that should include eleven topics as follows, and should be enforced under a Municipal Ordinance:

1. Definitions and General Concepts
2. Public Solid Waste
3. Domestic Solid Waste
4. Medical Solid Waste
5. Industrial Solid Waste
6. Solid Waste Recycling and Resource Recovery
7. Solid Waste Disposal
8. Management and Operation of Services
9. Duties of Those Providing and Receiving Services
10. Costs and Penalties
11. Temporary Conditions.

N.0.5 Recommended Organization for MSWM

The MSWM will be in charge of the Refuse Collection and Public Cleaning (RC&PC) Department, of the Urban Environment Maintenance Bureau. Under this Bureau will be also located the Vehicles and Equipment Department, that is mandatory to get a regular collection service.

The Department of Refuse Collection and Public Area Cleaning should be divided into four sections: Planning and Control, Refuse Collection, Public Area Cleaning, Waste Disposal. The Refuse Collection, Public Area Cleaning and Refuse Disposal Sections are to be divided into various units according to the duties of each section. It is important to take into account that these units will not be headed by chiefs but led by operational team leaders; as units are not administrative divisions it will cut bureaucracy and facilitate day to day operations as well as distribution of equipment and control.

The Planning and Control Section should prepare the operational plans and programs, and continuously evaluate the operational performance and costs, as well as compile relevant documents for all administrative levels, as follows:

- daily operational control - expressed in forms, tables and graphics for current evaluation;
- monthly managerial report - with graphics and indices for an objective evaluation;
- monthly directive report - concise and based in the managerial report.

A control system is essential for success or existence of an operational agent or enterprise, and must go deep into the operational costs, production, manpower, equipment, spent time, length, productivity and other indices for performance evaluation. The inspector of contracted operation does not need to control, but monitor quantitative and qualitative contractual parameters.

N.0.6 Privatization, Contract and Concession of Services

Municipality may operate directly or indirectly the MSWM system, through a department or a semi- autonomous entity, as an institute or a public enterprise. In any case, it may contract and pay private operators, charging the citizens.

As an alternative, the municipality may give services under concession to a company that will charge and get the payment directly from the beneficiaries, so called customers. This is the current and informal way to attend demands from commercial and industrial customers, and just starting to be used for domestic SW services in undeveloped countries.

As a general rule, public organizations operate with low efficiency, incurring higher running costs in comparison to private organizations. However, it is inherent to such organizations to show more interest in social and public issues.

Conversely, private enterprises are profit oriented, aiming for high efficiency and prices; they constantly depend on market competition and on public enforcement and monitoring of SWM services.

A healthy balance between public and private interests and actions is desirable to develop a good MSWM system. Transfer of activities that constitute the actual subject of MSWM to the private sector is recommended only when the two following conditions are met:

- The municipality is capable of performing its exclusive responsibilities: to regulate and penalize; to set adequate and feasible taxes and fees; to plan and monitor the operations and their costs and finally to contract services out and be in a position to terminate a contract or substitute the contractor in the event of an unexpected incident(s).
- More than one enterprise or company technical and economically capable to take in charge of SWM activities is available in the market.

The contracting out of services to compensate for the shortage in equipment, material and human resources is recommended, firstly for vehicles and equipment maintenance, but also for additional or complementary public cleaning, waste collection and disposal services.

Ordinary operations of the Refuse Collection & Public Cleaning Department may not be contracted unless the department is organized and fully capable of planning, regulating and fixing parameters for the operations and costs, and monitoring the transferred services. Training of personnel for these functions is essential, and in short time would be welcome an advisory assistance for planning and control.

Concession of services could be introduced in the long run, after a sufficient, well established and accepted tariff plan is established, in conjunction with a capable municipal department, as considered above. Both situations also depend on capable personnel and enterprises in the market offering cleansing services. These conditions do not seem to exist at this moment.

N.0.7 Integrated USE Improvement in the Model Community Project

As result of pilot projects tested in Granada, the Model Community Project might be implemented in this city and it is intended to be a model for Chinandega and Leon.

The Model Community Project comprises one exclusive program of INAA - water supply improvement - to be coordinated with two others involving INAA, MINSA and

municipality of Granada: (1) on-site DWW treatment , sharing investment funds with local storm water drainage, and (2) SW collection system.

INAA will execute the works for water supply and wastewater collection and treatment, while the municipality will take in charge drainage works and solid waste collection and disposal, according to their specific competence.

The solid waste collection and disposal will be in charge of the RC&PC Department of the UEM Bureau, giving priority to the areas chosen for the others projects, but extending the collection area as convenient.

The drainage and DWW systems have more intimate relationship and constitute a joint enterprise known by Special Project for Integrated USE Improvement in the Model Community - PECM.

The PECM will be a serial of integrated projects in small areas, dominate by the physical local conditions and the technical needs for on-site DWW collection & treatment and storm water drainage. Thus, technical reasons recommend planning together both systems.

A local system must be accepted by the community where it is located, and the beneficiaries must pay its operational costs, maintenance included. Eventually, the community would contribute with labor or land for the facilities, in order to reduce the fees they must pay. A deep community involvement is requested; specialized and reliable persons should orient, motivate and get the community's commitment to cooperate and to pay the operational fees. MINSA, through local SILAIS with aid of the Sanitary Education Department, is strongly recommended for this mission.

A formal commitment will be essential to elect that community as beneficiary.

INAA, MINSA and municipality will constitute, by convene, a **steering committee** to manage the PECM, whose main attributions should be:

- 1) to formulate directives for the PECM.
- 2) to conduct the planning and design of the projects proposed by the executive authorities (INAA or the municipality), and evaluate their practical, technical and financial feasibility.
- 3) to approve the inclusion of systems that have been evaluated.
- 4) to request finances for the approved systems to the responsible national institution (or international organizations if the committee has the legal capability for this purpose).
- 5) to ratify the technical reports on the PECM.
- 6) to ratify the accounts and financial reports.

The steering committee will be composed by one representative of each involved entity: INAA/Region IV, MINSA/SILAIS and municipality of Granada. Each year the representatives will elect the chairman, and an executive secretary will take care of the bureaucratic affairs. Planning, coordination and public relations would be the routine of the committee.

The representative must be a capable and influential authority in his entity, taking in charge the coordination and the monitoring of the internal tasks concerning to the PECM. The representative of the municipality would be an engineer of the PW&S Bureau or of the UEM Bureau.

INAA/Region IV and municipality will be in charge of the engineering (design, construction and maintenance) of their specific matters, and the respective financial management (budget, account and cash flow). MINSA/SILAIS will be in charge of the sanitary education and commitment of the community, and certainly will also interact with the RC&PC Department.



N Institutional Improvement Proposals for the Implementation of the USE M/P

N.1 Introduction

Organizational and institutional improvements, that are proposed in this study, are outlined in the following items:

- Basic organization charts for the municipality.
- Specific organizational functions.
- Instructions and regulations.
- Strategies for collaboration among the institutions.

The municipality should be the main institution involved in the improvement of the USE and therefore must be capable of improving the organizational structure, legal framework and, in particular, training the personnel. Efforts have been made by the municipality, however, some areas still require improvements, particularly:

- Currently, only one bureau (Municipal Services Bureau) manages all municipal services and some public works. The responsibility of managing all these tasks is beyond the capability of the bureau; the personnel are not trained to administer individual services, resulting in the mayor's direct involvement in general managerial duties.
- For the improvement of USE, assistance of low income citizens is essential through establishment of land use and housing norms, as well as provision of clear and simple instructions; this would require an adequate organizational structure and policy within the Municipal Planning and Projects Bureau.
- Improved fee collection rates and auditing are required through reasonable methods that do not rely on the discretion of individual collectors. This would require a capable Finance Department under the Bureau of Administration and Finance.
- A frequently updated cadastre is necessary in order to provide information for urban planning and USE improvements. It would be practical if the Cadastre Department and the Urban Development Department are under the same bureau, so that data can be exchanged readily.
- The mayor should be at liberty to coordinate and give directives to the executive directors of the bureaus; administrative tasks should be delegated to the staff of the Administration and Finance Bureau in order to free the mayor to perform executive duties.

A basic organizational structure is proposed for the municipality as shown in Figure N-1, considering the various needs for improvement. The structure would have to be implemented gradually according to the plans and targets set, as well as human and financial resources available.

N.2 Proposed Organizational Structure

The overview of the proposed organizational structure is illustrated in Figure N-1 to Figure N-5.

In order to maximize the capability of the municipality, without disturbing its normal operations, the organizational reform should be supervised and assisted by an expert in organization methods and personnel training. The expert should be supported by a legal advisor and be offered a high ranking position in the mayor's staff.

The existing international cooperation advisor should also be involved in the modification of the organizational structure, in view of the international cooperation projects that are involved with the municipality. The main departments that would be reshuffled and modernized, when the M/P is executed, are as follows:

- 1. Bureau of Urban Environmental Maintenance**
 - Department of Refuse Collection and Public Area Cleaning
 - Department of Vehicles and Equipment
- 2. Bureau of Public Works and Services**
 - Department of Public Construction and Maintenance (in particular the Urban Maintenance Section)
- 3. Bureau of Municipal Planning and Projects**
 - Cadastre Department
 - Department of Urban Development
 - Department of Private Constructions
- 4. Bureau of Administration and Finance**
 - Department of Finance (in particular, the Budget Control, Tax Collection and Audit Sections)
 - Department of Purchase and Contracts (under and assistant director).

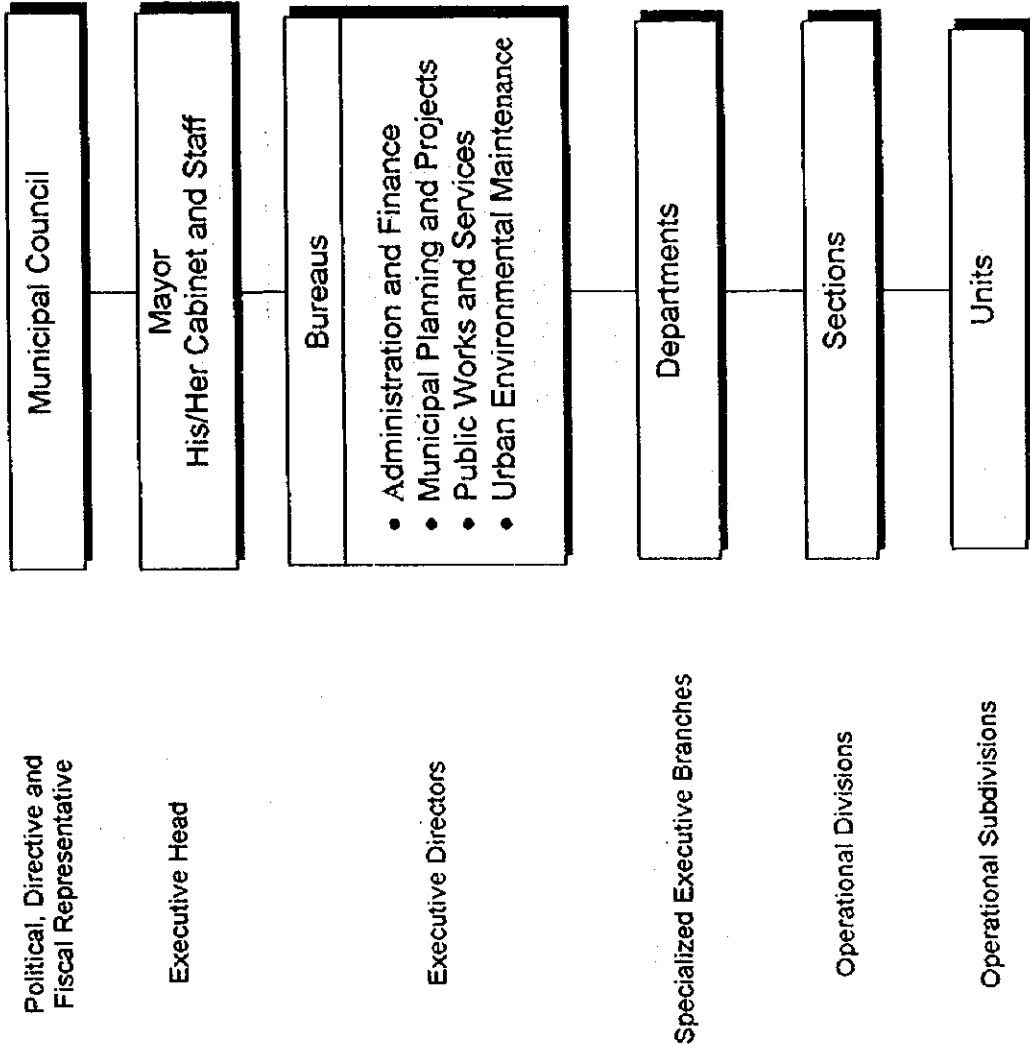


Figure N-1: General Organization of the Municipal Administration

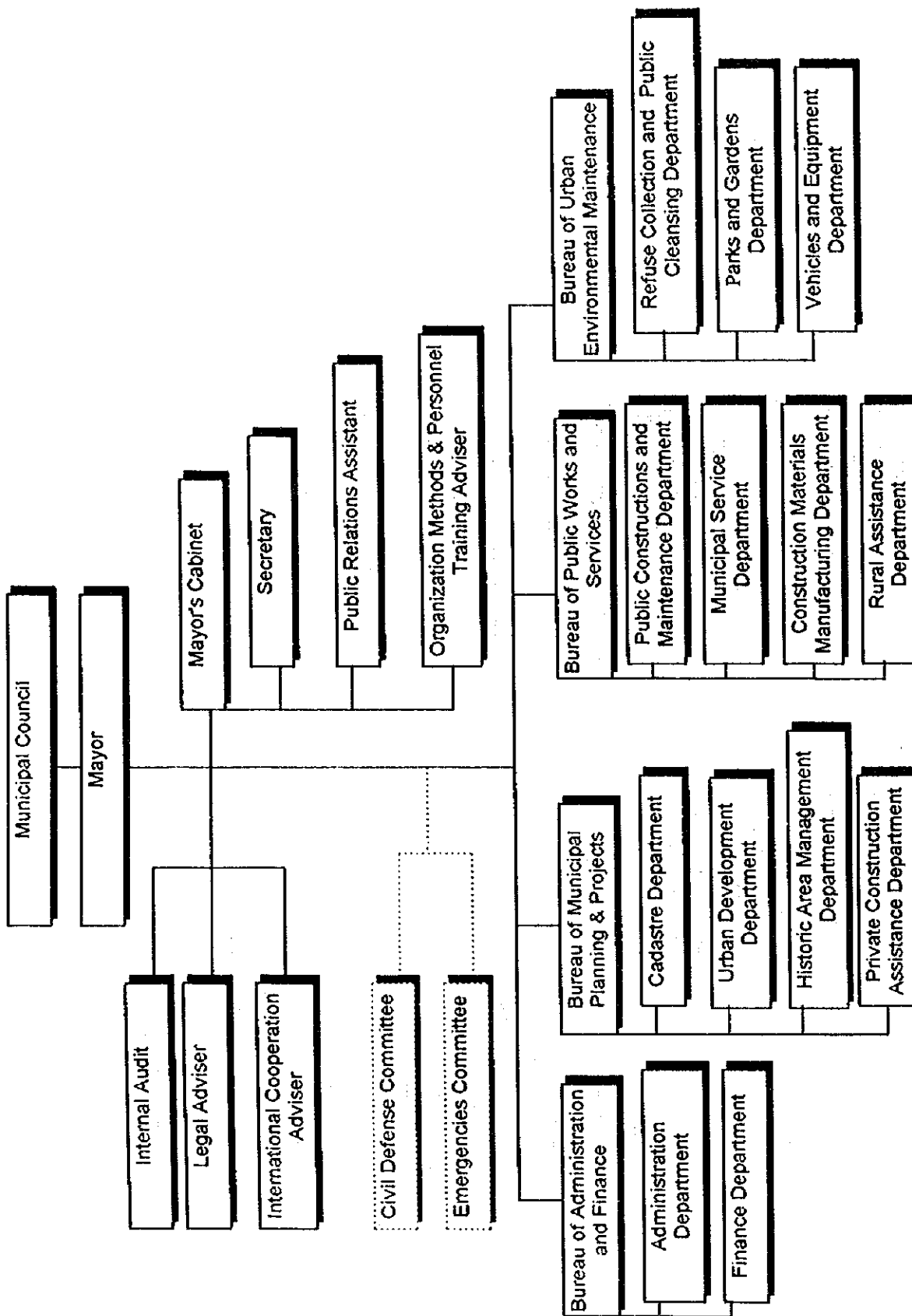


Figure N-2: General Organizational Structure

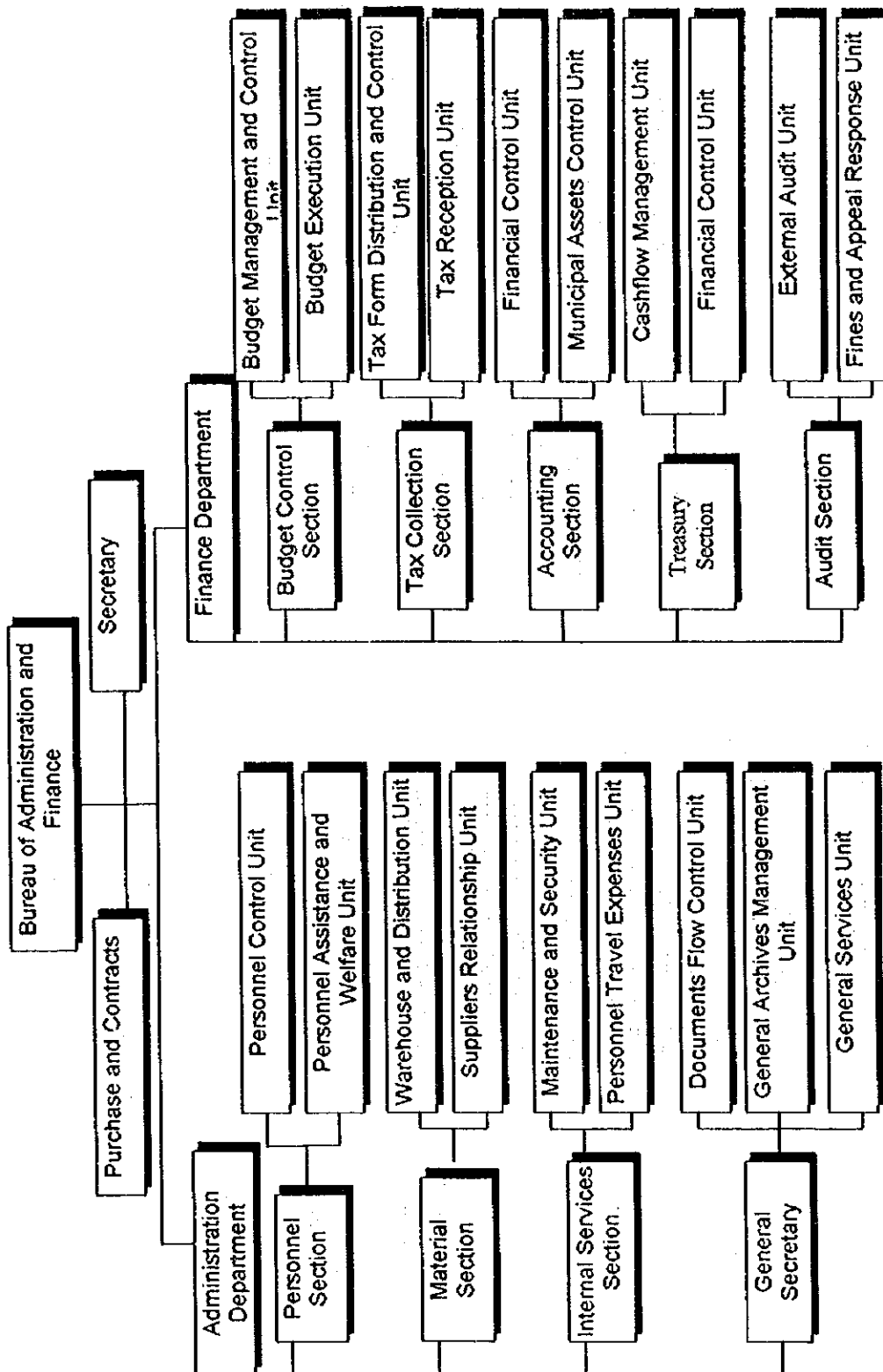


Figure N-3: Organizational Structure of the Bureau of Administration and Finance

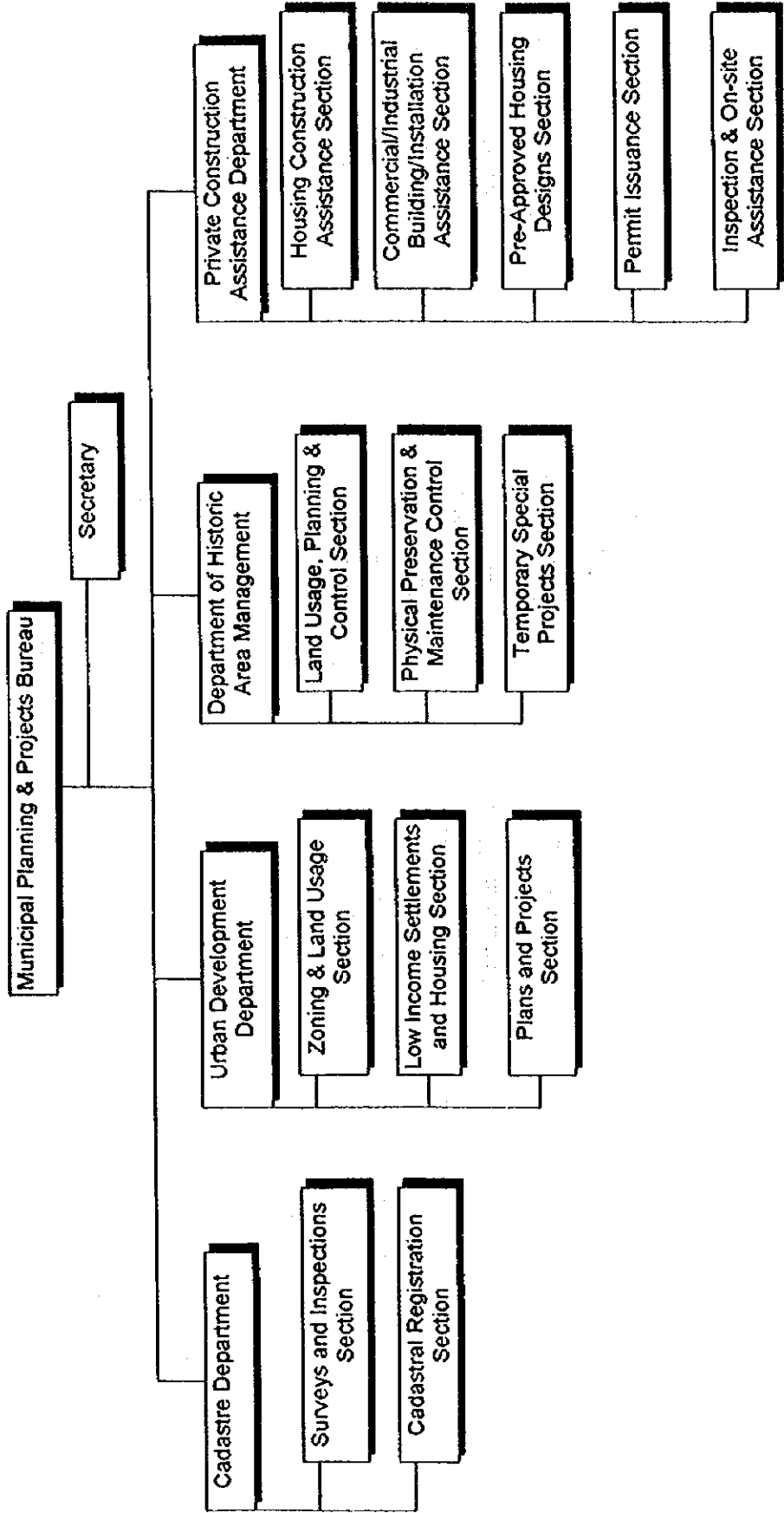


Figure N-4: Organizational Structure of the Bureau of Municipal Planning and Projects

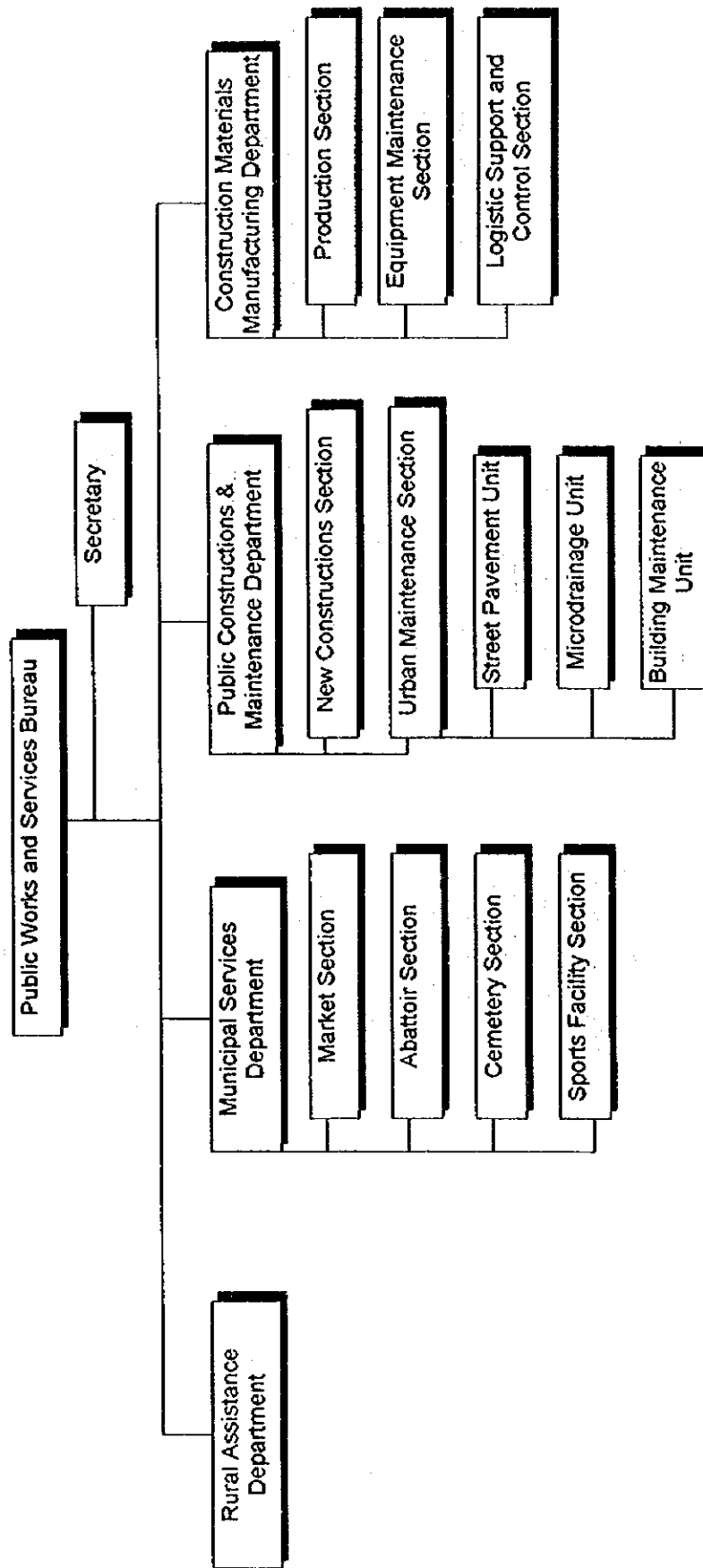


Figure N-5: Organizational Structure of the Bureau of Public Works and Services

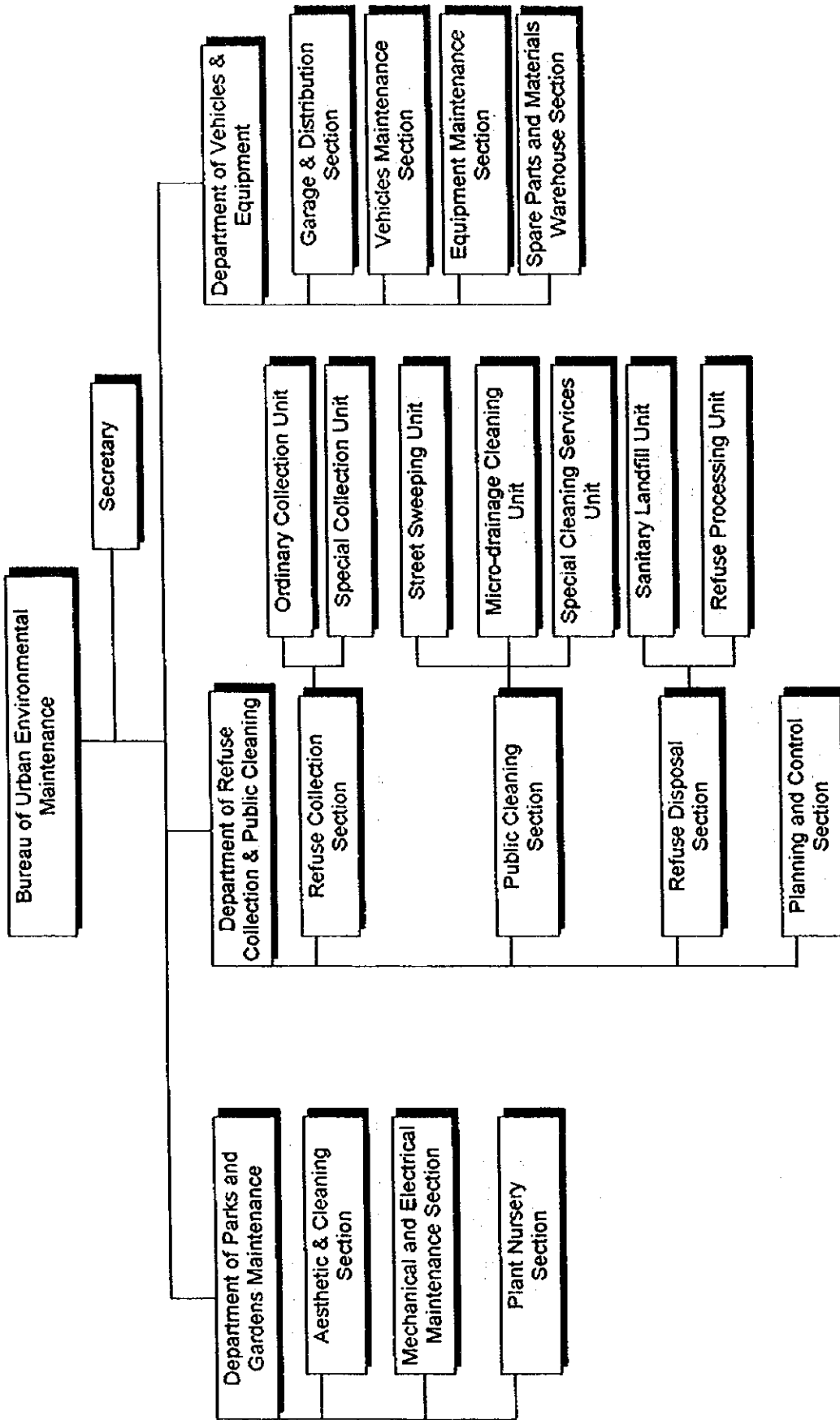


Figure N-6: Organizational Structure of the Bureau of UEM

N.3 Specific Organizational Functions

Municipal Council

- To establish policies and guidelines to manage the regional and economic resources within the municipality.
- To supervise the administrative duties of the Mayor.

Mayor

- To hold the highest executive power in the municipality; also to perform duties established by the Municipal Council.
- Mayor's Cabinet
- To establish and continuously improve norms, procedures and administrative tasks in the municipality.
- To assist the mayor to supervise and coordinate the executive directors.
- To execute administrative tasks directly related with the mayor and his/her staff.
- To establish and maintain a good relationship with the media; listen and respond to positive criticisms or complaints made by citizens.

Internal Audit

- To establish financial regulations and procedures that might affect the municipal economy.
- To review the financial and/or economic performance of the municipality.
- Legal Adviser
- To give advise on regulations related to administrative and civil law that can be applied to other administrative acts of the mayor's office.
- To objectively scrutinize and revise contracts and conduct other legal administrative duties.
- To defend the municipality judicially, as a mayor's representative.

International Cooperation Adviser

- To establish a relationship with foreign organizations that are willing to cooperate, directly or through national institutions.
- To act as a representative in committees that coordinate international cooperation agreements.
- To evaluate the performance and results of each cooperation agreement.

Civil Defense Committee

- To plan and execute emergency procedures and protect national security (the committee is established and operations are executed by the national army with the cooperation of municipalities).

Emergency Committees

- To plan and execute disaster relief during natural disasters and maintain public safety in emergencies (these committees are temporary task forces established in cooperation with other public and private institutions whenever there is a natural disaster such as earthquakes, floods, and droughts).

Bureau of Administration and Finances

- To perform all the administrative duties of the municipality.
- To manage material and human resources, as well as provide internal and logistic support.
- To centralize and conduct inquiries into all formal requests to the municipality made by the citizens; to inform them of the current stage in their inquiry and the authority's decision.
- To prepare the municipal budget according to the directors' proposals and with the mayor's approval.
- To control the municipal budget.
- To undertake accounting of income and expenditure, and the management of municipal assets.
- To plan and execute the collection of taxes, credits, and fines.
- To keep the accounts and impose sanctions, as defined in the ordinance.

Bureau of Municipal Planning and Projects

- To maintain the cadastre updated.
- To define zones and establish the conditions for urban land use.
- To establish and control settlement plans and housing projects for poorer citizens.
- To develop municipal plans and projects.
- To control the development of the historic area and supervise constructions.
- To prepare technical instructions (related to residential and non-residential construction projects) for the general populace based on regulations and instructions of the responsible authorities (municipal or others).
- To scrutinize and prepare standardized designs that will be approved for low income housing.
- To establish construction permits and user permits, as well as to execute the required inspections.

- To instruct and assist the citizens with respect to location, construction, and modification of properties.

Bureau of Public Works and Services

- To install and maintain public assets and systems in the municipality, with the exception of parks and gardens.
- To manage factories making construction materials.
- To manage all the municipal services, except those that are contracted out.
- To attend the needs of the rural area in terms of development and provision of services, under a special program by the municipality.

Bureau of Urban Environmental Maintenance

- To plan, execute and control all urban cleansing operations: waste collection (residential and non-residential), cleaning of public places, and final disposal of municipal waste.
- To maintain aesthetic standards, cleaning and management of parks, gardens, and public forests as well as operating the plant nursery.
- To provide, distribute, control and maintain the municipal vehicles, machines, and other equipment.

N.4 Enhancement of the Human Resources

The organizational structure of the municipality must be supported by skilled personnel, implying that the available personnel must be trained to perform various functions. An expert in organization methods and training should prepare and introduce the personnel improvements, so that a continuous training program can be implemented without disturbing the normal work flow of the municipality. The expert could be an external specialist and should be given a high ranking position, as proposed in the organizational chart outlined in Figure N-2.

The M/P proposes the following training programs for municipal personnel involved in USE improvements.

Bureau of Municipal Planning and Projects

The personnel will receive training on specialized information in the following areas:

- Formulation of the cadastre.
- Planning of urban developments.
- Assistance of private construction projects.

Professional and operational training on collection and evaluation of documents, plans, projects and regulations should be provided; also on reviewing and supplementing any deficiencies in the data available. The ultimate aim is to establish a simple but effective municipal planning structure in Granada, mainly regarding:

- Zoning & land usage
- Low income settlements and housing

- Instructions on building houses
- Pre-approved housing designs
- Instructions on the construction of commercial and industrial buildings or installations
- Issuing permits
- Inspections & on-site assistance

Bureau of Urban Environmental Maintenance

The managerial training program for personnel of the Department of Waste Collection and Public Area Cleaning should cover the criteria and goals for the USE, employee motivation strategies as well as operation and cost monitoring and control.

The personnel of the Department of Vehicles and Equipment should undergo managerial training on the criteria for vehicles and equipment usage, as well as the control of their operation, maintenance and costs.

Operational training should cover the following items.

- Planning and control of operational, maintenance and service costs.
- Planning and control of vehicles and equipment maintenance as well as maintenance costs.
- MSW collection (regular collection services).
- Primary vehicle maintenance.

Bureau of Administration and Finance

The personnel of the Bureau of Administration and Finance should undergo operational as well as general training on:

- Management of the municipal and departmental budgets.
- Efficient tax collection methods.
- Improved methods of obtaining information such as statistical data and reports from field surveys conducted.

N.5 Normative Improvement

Legal and technical norms play an extremely important role in supporting the administrative capability of the municipality. USE improvements would require the collaboration between the municipality and national institutions, through a well planned strategy, as well as public cooperation.

The M/P proposes to divide "individual" norms that are exclusive to the municipality and "combined" norms shared with other national authorities; both must be established simultaneously or according to an agreement between the municipality and national authorities.

Improvement of the "Individual" Norms

The norms for the following items should be reviewed and realized, taking into account that the legality must be completed within a year after the publication of this report.

- Zoning & Land Usage
- Low Income Settlement and Housing

- Cadastre
- Permit system for the construction or installation of buildings and facilities, and usage of residential and non-residential buildings.
- Permit issuance for pre-designed low income housing.
- Inspection and assistance during the construction of low income settlements.
- Collection and disposal of municipal solid waste and the cleaning of streets.
- Usage of the microdrainage system

Improvement of the "Combined" Norms

The municipality should negotiate and cooperate with other national authorities that are involved in the USE, aiming to achieve a better strategy to control the sanitary conditions in the city.

- (a) To centralize all the information that is frequently accessed by citizens in the municipality (e.g. the manager of cleansing services, constructors of DWW treatment facilities, and the beneficiaries of the sanitary services);
- (b) To offer information to the citizens as a clear and simple instruction using understandable language so that every body could use it.
- (c) To exchange data among the authorities that offer services to the population, aiming to effectively expand the provision of services as well as improve the methods of collecting service fees.

The municipality would have to create legal and technical norms in order to:

- support the system of permits that are mentioned above (with INAA, MINSA, and MARENA)
- support MSW (with MINSA), medical waste (with MINSA and MARENA) and industrial waste management (with MARENA).
- support the administrative duties related to the microdrainage system (with INAA, MARENA and MINSA)
- share duties and responsibilities for the micro-drainage system: i.e. streams, lakes, river basins (with INIFOM, MARENA, INAA, MCT)
- manage the domestic wastewater produced in the urban area (with MINSA, INAA)
- manage the wastewater produced from commercial and industrial buildings in the urban area (with MINSA, INAA).

N.6 Recommended Regulations, Instructions and Administrative Guidelines

The study team recommends the following instructions and administrative guidelines for the authorities.

a. INAA

i. Instructions on Potable Water Connection and Services

Where there is a water supply network in the area: the costs and administrative procedures for contracting out services, the technical requirements for connecting to INAA's network and the instructions must be specified and different for residential, commercial and industrial buildings.

ii. Instructions on Connection of the Wastewater to the Sewer

Where there is a sewage network in the area: the costs and administrative procedures for contracting out services, the technical requirements for connecting to INAA's network and the instructions must be specified and different for residential, commercial and industrial buildings.

Through the permit system the municipality should enforce and instruct the citizens, during the construction of their houses, to connect them to the sewer network, if it passes by the property.

INAA, the municipality and MINSA should implement a program to connect houses that are already built next to the sewer network, at affordable prices for the residents.

iii. Instructions on Wastewater On-site Treatment and Disposal Facility

Even where there are no sewers in the street, citizens still require adequate treatment for their wastewater and a disposal facility. Therefore, a facility should be built/installed according to INAA's technical instructions. INAA may recommend or enforce individual or collective systems, depending on each unique situation. A Municipal Ordinance may enforce the appropriate recommendation.

INAA should build and/or operate collective facilities. In any case, INAA should operate sludge collection services from on-site facilities (both individual septic tanks or soak away pits and collective systems), and should provide inspection/maintenance services for them. The municipality and MINSA should plan and cooperate with INAA to find the most appropriate on-site solutions for treating domestic wastewater generated from very poor communities where the sanitary and social conditions are most affected.

b. MINSA

i. Guidelines for On-site Medical Solid Waste Management

MINSA should establish a classification for medical SW, procedures for handling said waste, equipment, organization and required qualifications of the personnel who will be in charge of the medical SW. These concepts should be presented as instructions that should be further consolidated in a regulation or "code of practice", initially targeting medical institutions and laboratories.

The municipality may collect and dispose of non-hazardous medical waste that are separated/classified by medical institutions prior to discharge. However, radioactive and hazardous (excluding infectious and sharps) waste should be regulated by MARENA.

ii. Instruction on Connection of the Wastewater to the Sewer

In the sewer connection program, MINSA (together with INAA and the municipality) should primarily give clear explanations to the public and provide sanitary education.

iii. Instructions on On-Site Wastewater Treatment and Disposal Facility

Even where there are no sewers in the street, citizens still require adequate treatment of their wastewater and a disposal facility. Therefore, a facility should be built/installed according to INAA's technical instructions. INAA may recommend individual or collective systems, depending on each unique situation. A Municipal Ordinance may enforce the appropriate recommendation.

MINSA and the municipality should plan and cooperate with INAA to find the most appropriate local solutions for treatment of domestic wastewater generated from very poor communities where the sanitary and social conditions are most affected.

c. MARENA

i. Guidelines for Industrial Waste Management

MARENA should establish a classification of industrial waste, procedures to classify and segregate them and on-site storage methods. Disposal of such wastes should also be clearly defined. MARENA should recommend a basic internal organizational structure for industries concerning on-site management of all generated waste.

MARENA should monitor and establish adequate conditions for collection and disposal of non-hazardous industrial waste by the municipality.

MARENA should promote market oriented incentives for private investment in collection and/or disposal of hazardous and non-hazardous ISW. It is recommended that MARENA study and organize a registry of industrial categories and the types of waste generated. Subsequently, an inventory of Nicaraguan industries, the IW generated, and common practices for ISW management should also be prepared. These elements mentioned above are pre-conditions for regulating the IW problems in practice.

Finally, a very simple and realistic waste classification should be established that should not be based on difficult or sophisticated analytical methods, but it should be based on the actual human and technical resources of Nicaragua.

ii. Guidelines for Management of Hazardous Products

MARENA should collect technical information on hazardous products and their waste, and also the amount of these products imported/manufactured in Nicaragua, in order to evaluate the situation.

MARENA should also organize and maintain an inventory of manufacturers and importers of hazardous products and begin to monitor its flow.

iii. Guidelines for Drainage Systems, Classification and Responsibilities

Micro-drainage, as part of streets, roads, and public areas should be the responsibility of the municipality and MCT (roads and adjacent public areas are under MCT jurisdiction);

Macro-drainage are permanent fluvial course and seasonal streams that should be under the responsibility of MARENA (normative, inspections, penalties) and MCT (works and maintenance).

iv. Guidelines for Discharge of Wastewater into Waterways

MARENA should regulate wastewater flow into streams and dry river beds, i.e., wastewater from domestic, industrial, institutional and any other sources discharged into the macro-drainage system.

d. MCT

i. Guidelines on Urban Road Drainage

The MCT should establish regulations on the use of micro-drainage along urban roads under its jurisdiction, and provide instructions for the citizens through the municipality.

ii. Instruction on Constructions along Urban Roads

The MCT should instruct and regulate construction projects that could affect the roads under its jurisdiction.

e. Municipality

i. Guideline on Solid Waste Collection/Disposal, and Cleaning of Public Streets

The municipality should distribute a complete set of regulations and specific instructions to the citizens on acceptable behavior related to SW and littering of public areas.

ii. Guideline for Usage of the Micro-drainage System

The municipality should regulate the discharge of wastewater into the micro-drainage system and supply technical instructions for connections, as well as prohibiting and punishing those who dispose SW into it.

iii. Regulations on Urban Zoning and Land Usage

The municipality should revise and enact regulations, this process should begin with the improvement of access to information for the public, by publicizing plans and instructions on zoning, suitability and requirements for locating of private constructions.

iv. Regulation and Registration of Buildings

The municipality should review and prepare regulations, but it should begin by improving access to information for the public by publicizing instructions on location of new buildings and sanitation facilities. Connection to the sewer or collective systems, requirements for sanitation systems and standards should be reviewed. Information on requirements for other public services should also be provided through a public information system.

The municipality should review and prepare a Permit System that would comprise: (a) Construction Permit for housing, commercial and industrial buildings or installations; and (b) User Permit for buildings/installations. Using this system, the municipality should immediately submit data to the Cadastre Department, which should supply relevant data to other public services and the Finance Department of the municipality.

The municipality should prepare scale models and drawings for pre-approved designs for low-cost housing; these buildings must also be inspected and registered.

The municipal administration should review and improve its cadastre, in order to supply data for all municipal services and financial sectors. It should also discuss land use and compatibility with other public services.

N.7 Recommendations on Collaboration Among Institutions

STRATEGY	MUNICIPALITY	INIFOM
OBJECTIVE	<ul style="list-style-type: none"> To train all municipal personnel to fulfill their duties at an optimum level. 	
ACTIONS	<ul style="list-style-type: none"> To employ an expert in organization, administrative methods, and personnel training in the mayor's cabinet. To progressively organize the municipality with the proposed structures and train directors of departments, sections, sectors, and secretaries. To train the legal adviser and inspectors of services and buildings. To improve and accelerate data gathering for the cadastre and public services inventory. 	
OBJECTIVE	To train the municipal personnel to assist citizens on matters related to the ordinances on sanitation and the urban environment.	
ACTIONS	<ul style="list-style-type: none"> To institutionalize personnel training to achieve the objective; i.e., to select, and train personnel to assist citizens. To prepare and maintain up to date technical and administrative information for citizens in a simple form (instruction) or as a Regulation (if possible). To establish zoning and restrictions for urban land use. To establish a permit system within the municipality. To prepare pre-approved designs for low income housing. To integrate the municipality's registry of Public Services and the list of maps and services of INAA, MINSA, etc. 	<ul style="list-style-type: none"> To assist the municipality in training the personnel. To improve the reputation of the municipality so that it can have a better relationship with other entities which offer services to the population.
OBJECTIVE	To train the municipal personnel in the Street Sweeping and Micro-Drainage Sections to execute urban services at an optimum level.	
ACTIONS	<ul style="list-style-type: none"> To prepare and establish a SWM Regulation. To prepare and establish a Tariff Plan for Urban Cleansing. To plan urban cleansing services: domestic waste collection, street and public area cleansing, drainage, and waste disposal. To gradually introduce and control land use, planing of services, evaluating results and reviewing plans. To enforce the SWM Regulation and Tariff Plan for Urban Cleansing. 	<ul style="list-style-type: none"> Assist the municipality and provide training for its personnel. To support the approval of the Regulation and Tariff Plan, by the municipal council and other related authorities.

STRATEGY	MUNICIPALITY	MINSA	INAA
OBJECTIVE	<p>1. To regulate domestic wastewater in the urban area, assist citizens to comply with the Sanitary Ordinances (Decree 393-88, art. 8 and 9)</p> <p>2. To improve sanitary conditions and vermin control in the city.</p>		
ACTIONS	<ul style="list-style-type: none"> To ensure, under the Municipal Ordinances (M.O.), that new residential constructions are: (a) connected to the sewage system, if there is one in the front premises, or (b) connected to a collective local system for wastewater treatment and disposal, if there is one, or (c) provided with an individual wastewater treatment and disposal system, or (d) provided with individual disposal systems authorized by the municipality as a temporary measure. Residents will be given instructions, if needed on, the method of operation. Such requirements will be observed before construction permits and user permits are issued. Failure to comply will result in penalty as stated in the Ordinance. To ensure under the Municipal Ordinance that existing residential buildings should comply with the same requirements as the new constructions, under the same penalty system, but with the following time limits and conditions: (1) a one year limit for conditions "a" and "b"; (2) a one year limit for communities or neighborhoods to present the municipality their construction proposals of collective systems which should be included in the Special Program for Model Community Integrated USE Improvement Project (PECM); (3) a one year limit to construct individual installations in conditions "c" and "d", for those which are not included in "a" or "b" or those that can not be included in PECM. Coordinate the development of the PECM with MINSAs and INAA with initial resources from a revolving fund which will maintain and support the payments for the construction of the installations, household connections, system operation and maintenance. To encourage the cooperation and active participation of citizens in the PECM, to support the system by paying the costs, and active participation of citizens in the construction and/or the maintenance of the system. To prepare necessary instructions for citizens based on the technical instructions provided by INAA and the sanitation induction course of MINSAs; train the personnel that will assist the citizens. 	<ul style="list-style-type: none"> To provide the necessary political support to obtain a revolving fund for the PECM. To prepare an education plan for communities and schools on the objectives of the proposed Ordinances and the PECM, and coordinate with the municipality. To integrate the PECM using its experience in training, community relations and its legal authority to perform sanitary inspections. 	<ul style="list-style-type: none"> To prepare standard designs, with the budget allocated for collective and individual systems, which can be suited to the existing circumstances. To prepare instructions and technical information for the municipality to instruct and distribute to the citizen. Prepare a viable financing plan for the various economic levels of the population, but one that ensures the repayment of the fund. Establish, in coordination with the municipality, all the economic and administrative bases of the revolving fund for the PECM. Practice, with the municipality and MINSAs, the necessary steps to obtain the initial resources of the revolving fund. To manage the fund's resources which will be administered by a committee formed by the municipality, INAA and MINSAs. To act as the executive authority for the PECM (constructor, operator and direct and indirect maintenance provider). To coordinate with the local INAA division, dedicated to the collective and individual systems for wastewater treatment.

STRATEGY	MUNICIPALITY	MARENA	INAA	MINSAs
OBJECTIVES:	<p>1. To regulate disposal of wastewater disposal from commercial and industrial establishments in the urban area, supporting the Sanitary Regulation (Decree 393-88, article 8 and 9) and the Regulation for Contamination Control (Decree 33-95, articles 9, 72 and 74).</p> <p>2. To improve the sanitary conditions and vermin control in the city.</p>			
ACTIONS	<ul style="list-style-type: none"> To ensure, under the Municipal Ordinances, that new constructions for industrial or commercial use are: (a) connected to the sewage system, if there is one in the street, or (b) connected to a collective local system treatment and wastewater properly disposed, if there is one, or (c) provided with an individual treatment and disposal system, or (d) provided with individual disposal systems authorized by the municipality as a temporary measure. Employees will be given instructions, if needed, on the methods of operation. Such requirements will be observed before construction and user permits are issued. Failure to comply will result in penalty as established in the Ordinance. To ensure, under the Municipal Ordinance, that existing buildings for commercial use should comply with the same requirements as new constructions, under the same penalty system with a one year limit to correct the situation. To ensure, under the Municipal Ordinance, that existing buildings for industrial use should present, within a one year limit, proof that they have complied with art. 72 of Decree 33-95 and that the corresponding Gradual Decontamination Plan was accepted by MARENA and INAA. To forbid, under the Municipal Ordinance, any municipal exemption or financial benefit to commercial or industrial property owners that are not complying with the requirements above. To prepare the necessary technical instructions for small commercial and industrial constructions based on technical guidelines provided by INAA, MARENA and MINSAs; and train the personnel who will assist in giving guidance. 	<ul style="list-style-type: none"> Support the municipality. To prepare instructions and technical information so that the municipality can instruct and distribute them to interested parties. 	<ul style="list-style-type: none"> Support the municipality. To prepare instructions and technical information so that the municipality can instruct and distribute them to interested parties. 	<ul style="list-style-type: none"> Support the municipality. To use its legal authority to perform sanitary inspections and impose penalties.

STRATEGY	MARENA	MUNICIPALITY	MCT	MINSA
OBJECTIVE	<ul style="list-style-type: none"> To prevent floods and its effect on the population and public and private assets; as well as river and lake pollution due to liquid and solid wastes discarded in riverbeds. To prevent surface and groundwater pollution as well as the inappropriate discharge of wastewater into the sewer system. To define clear and realistic duties for the state and the municipality related to stormwater, and permanent/intermittent river flow. 			
ACTIONS	<ul style="list-style-type: none"> To define technical and legal classifications of urban drainage into micro-drainage and macro-drainage for construction and maintenance purposes. The characteristics of the basins, its regional importance as a natural resource and as drainage will be considered. Technical and financial capabilities of the municipality to provide maintenance, use of ditches by non-municipal institutions, its sanitary importance, etc. will also be considered To define the obligations of the municipality (micro-drainage) and MCT (macro-drainage): (a) through an agreement or, in case no agreement is reached, (b) through a bill that MARENA will present to the National Commission of Water Resources (CNRH) requesting its approval and subsequent guidance by the President of Nicaragua. To assist in formalities for a legal definition of responsibilities and its effective fulfillment. 	<ul style="list-style-type: none"> To support MARENA. To manage the micro-drainage system. 	<ul style="list-style-type: none"> To support MARENA. To manage the macro-drainage system. 	<ul style="list-style-type: none"> To support MARENA.
OBJECTIVE	To regulate industrial waste management (IWM)			
ACTIONS	<ul style="list-style-type: none"> To define responsibilities of IW generators related to (1) minimizing IW, (2) internal management, (3) external management, (4) the effect of IW on public health and the environment, (5) all expenses involved in the management of IW and mitigation of adverse impacts. To instruct the generator on internal management of waste. To establish the IW types and procedures to classify them, beginning with simple methods which do not depend on sophisticated and expensive studies. To establish restrictions for IW disposal. 	<ul style="list-style-type: none"> To instruct IW generators to comply with MARENA's requirements. To collect and dispose IW certified as non-hazardous waste. 		<ul style="list-style-type: none"> To inspect and monitor IW at their generation source. To monitor IW collected by the municipality.

STRATEGY	MARENA	MUNICIPALITY	MCT	MINSA
OBJECTIVE	To control IW and provide a market for related private services.			
ACTIONS	<ul style="list-style-type: none"> • * Beginning in the municipality, further extending to the rest of the country. • To organize and maintain a register of industries in Nicaragua, including the raw materials used, industrial processes, liquid and solid waste generated, including details on handling, quantity, characteristics and classification. • To organize and maintain an inventory of companies and organizations which offer services related to IW with specifics about such services. • To organize and maintain a mandatory information system on IW transportation, including generator's name and address, as well as transporters' and receivers' details. • To organize and maintain a technical information system about IW management which should be very accessible, without direct cost to industries, professionals, students, and other interested parties. • To provide opportunities for access to information and training to professionals in IW management. • To obtain a long term low cost credit line for industries in order to implement their plans which should be approved by the responsible authorities, with the objective of (a) minimizing the IW generation and/or (b) treatment and disposal of IW. 	<ul style="list-style-type: none"> • To assist MARENA in formulating the register of industries and service companies. • To maintain an inventory of IW managed and the respective generators. 	<ul style="list-style-type: none"> • To inspect the transportation of IW on-route and demand the appropriate documentation. 	<ul style="list-style-type: none"> • To support MARENA politically. • To assist in obtaining data for the register. • To assist in personnel training of public and private entities. • To execute sanitary inspection in conjunction with MARENA.

STRATEGY	MINSA	MUNICIPALITY	MARENA
OBJECTIVE	Regulation of medical solid waste (SW) management.		
ACTIONS	<ul style="list-style-type: none"> To define the responsibilities of medical SW generators related to: (1) minimization of infectious medical SW and sharps, (2) internal management of medical SW, (3) external management of medical SW, (4) effects of medical SW on public health and the environment, (5) costs involved in the management of medical SW and mitigation of adverse impacts on the environment. To provide guidance on internal management of medical SW. To define the classification of medical SW and procedures to classify them. To establish restrictions on the disposal of different types of medical SW. 	<ul style="list-style-type: none"> To instruct medical SW generators to follow MARENA's guideline. To collect and dispose non-hazardous medical SW as well as infectious medical SW if it is authorized by MINSA. 	<ul style="list-style-type: none"> To provide guidance on the management of hazardous medical SW. To establish restrictions on disposal of hazardous MSW.

N.8 Contract System for the Private Sector

a. Public and Private Cooperation

As a general rule, public organizations operate with low efficiency, incurring higher running costs in comparison to private organizations. It is inherent to public organizations to show more interest in social and public issues. Conversely, private enterprises are profit oriented, aiming for high efficiency and prices; they constantly depend on market competition and on public enforcement and monitoring of SWM services.

A healthy balance between public and private interests and actions is desirable to develop a good MSWM system. Transfer of end-activities of MSWM to the private sector is recommended when the two following conditions are met:

- The municipality is capable of performing its exclusive responsibilities: to regulate and penalize; to set adequate and feasible taxes and fees; to plan and monitor the operations and their costs and finally to contract services out and be in a position to terminate a contract or substitute the contractor in the event of an unexpected incident(s).
- More than one enterprise or company technical and economically capable to take in charge of SWM activities must be available in the market.

The capability of the municipality of Granada would depend on sufficient improvements of its structural and human resources, as well as adequate regulations and practicable fees.

Capable personnel and enterprises will appear in the market when end-activities become attractive as a business, promoted by a new municipal directive for MSWM not only in Granada, but as a general concept in the whole country.

One must be very cautious about the general concept eventually "imposed" as wave of modernity. Privatization is expanding to a large extent throughout the world, and may give the illusion of a perfect solution, but it is unsuitable if basic conditions to manage privatization of the services are not met and citizens are taken advantage of. A classic example of an unsuccessful experiment was the recent concession system, already disbanded, of waste collection services in Managua.

b. Review of Operational Models

The municipality may directly or indirectly operate the MSWM system, either through a department or an autonomous entity, or as an autarchy or a public enterprise. In any case, it may contract and pay private operators, charging the beneficiaries.

As an alternative, the municipality may provide services under a concession to a company that will charge the payment directly from the customers. This is the current but informal way to accommodate the demands from commercial and industrial customers.

b.1 Direct and Indirect Administration Models

The efficiency of this model depends on the degree of flexibility and autonomy of the SWM operator to own and to manage the needed financial, human and material resources.

The advantages of the indirect administration should be the sufficient degree of freedom and self-regulation to minimize political intervention and to perform a good operational level. If the referred degree is insufficient, the low advantage could be surpassed by high costs of the structure and legal needs required by an enterprise or autarchy.

Both models are subject to excessive political interference, mainly to setting and collecting fees and contracting personnel. An exorbitant amount of bureaucracy that manages financial and human resources, as well as equipment maintenance is also a hindrance.

A serious problem of direct administration is the centralization of tax regulation, that are subject to central management for the whole municipality. Autarchy and public enterprises should collect and manage their own fees, even if they are insufficient and require subsidy from the municipal treasury.

On the other hand, direct and autarchic administration usually enable a certain amount of legal leeway to collect fees with a degree of margin to set appropriate fees without prior judicial approval.

The authority and rights are usually established by law that enables or issues the concession or contract to a public enterprise, and may vary in each municipality or country.

Aiming to reach high productivity in a limited time with the resources applied to the MSWM, supportive services and some operations may be contracted out; privatization would come about gradually if justified by positive results. The municipal department or authority in charge of the MSWM must be capable of presenting the contract, monitor and evaluate the results.

b.2 Concession

This model usually applies to the whole or a specific area of the city, comprising both street cleansing and waste collection tasks. That way, the results can be evaluated objectively without discussion about who failed in its task.

The municipality has to define the area and the quality level of the services, the length of the concession, tariff structure according to the different economic capabilities of the citizens, and the activities to be performed in the area.

The first main difficulty, that requires a sophisticated methodology, is to set the quality level of the services and to evaluate the results. The next difficulty is establishing a feasible tariff structure for fee payers and for concessionaires, and one that would generate sufficient income. Cross subsidy is often required, as well as additional subsidy from the municipal treasury if the proportion of citizens and activities capable of subsidizing others is too small. In such situation, not only quality monitoring but control of costs would be required, and the model would be losing its best appeal, simple monitoring.

If the concession is only based in the richest part of the city, SW services in the rest of the city would be unfeasible without a high degree of support to the municipality.

Managua tried the concession model in the best part of the city, and the results demonstrate that this model requires a very adequate framework. Although the concessionaire was a foreign, very experienced company, and collection trucks were mostly on loan from the municipality thus reducing its initial capital, the concessionaire halted its operation after less than two years, leaving the municipality with aggravated problems.

c. Micro-Enterprises

Enterprises are often requested to have efficient equipment and be financially able to provide adequate services, even during peaks in demand. But there are also potentials for micro-enterprises to participate in this market either as cooperatives, contractors or concessionaires (*). Of course, the municipality should set uniform mandatory conditions for both, normal and micro enterprises, considering the interest of all citizens that pay for the services, and not just the interest of the service provider.

() INIFOM promoted an interesting trial: PROMIDS - Integrated Management of Solid Waste Projects, developed as a pilot project in four municipalities (with a total of 2548 households/14480 urban inhabitants) in Masaya Department: Niquinohomo, Catarina, San Juan de Oriente, and Nandasmo. This was in preparation for a larger PROMIDS (15 municipalities with a total of 8627 households/47914 urban inhabitants) with estimated investments of US\$ 575,633.63, 82% of which is expected to be covered by foreign organizations.*

Women Micro-Enterprises, with the approval of the municipalities to sweep streets, collected all municipal waste using animal pulled cars and delivered waste to the disposal site where trenches were built and operated by the municipality. The micro-enterprises directly charge the customers according to a price list approved by the municipality. Residences pay every fortnight according to the length of the property: CS 5.00 (3 to 5m), CS 8.00 (5.1 to 7m) or CS 12.00 (more than 7m). Revenue from the fees reached break even point after operating for only three months.

(extracted from "PROMIDS and Annexes", edited by INIFOM - Urban Development and Municipal Services Director's Office - December 1996 and February 1997.)

Three important results must be considered from this trial:

- 1. Citizens were able to pay the service provider directly without political intervention.*
- 2. The tariffs were not cheap, especially considering that they do not cover waste disposal and indirect costs of the MSWM by the municipality.*
- 3. The concept could be implemented in very small cities; it is not applicable to a city the size of Granada, firstly due to the distance of the disposal site, which would require transfer stations and several micro-enterprises to operate the system. Also, the municipality must be capable of setting the tariffs, monitoring the services and building and operating transfer stations; furthermore, it would be almost impossible, due to social and political pressure, to revert back to the old collection system after the implementation of such system involving many micro-enterprises.*

d. Conclusion

The contracting out of services to compensate for the shortage in equipment, material and human resources is recommended, firstly for vehicles and equipment maintenance, but also for additional or complementary public cleaning, waste collection and disposal services.

Regular operations of the Refuse Collection & Public Cleaning Department may not be contracted unless the department is organized and fully capable of planning, regulating and fixing parameters for the operations and costs, and monitoring the transferred services. Training of personnel for these functions is essential, and in the short term an advisory group offering assistance for planning and control would be ideal.

Concession of services could be introduced in the long run, after a sufficient, well established and accepted tariff plan is established, in conjunction with a capable municipal department, as considered above. Both situations also depend on capable personnel and enterprises in the market offering cleansing services. These conditions do not seem to exist at this moment.

ANNEX O

Pilot Projects

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O Pilot Projects

O.1 Plan of Pilot Projects

O.1.1 Objectives of the Pilot Projects

The systems related to the urban sanitary environment in Granada City is extremely weak except for the water supply. The improvement of urban sanitary environment in Granada City is indispensable for the conservation of water quality of Lake Nicaragua which is very important as the future water supply source. However, improvement could be hardly perceived in spite of the efforts exerted for the improvement. Taking these conditions into account, it is assumed that a lot of difficulties arise in order to implement the plan suggested in Master Plan (M/P). Furthermore, pilot projects were carried out in this Survey in order to examine the problems which will be brought about and its countermeasure in planning and implementing projects for F/S. The objectives of the pilot projects are outlined below:

1. to examine the feasibility of the technical system proposed in the M/P,
2. to obtain basic data for the preliminary design of the Feasibility Study,
3. to enhance the public awareness and cooperation on USE improvement,
4. to demonstrate feasible level of cooperation between national, municipal and non-governmental entities in working together for an USE improvement project, and
5. to demonstrate some improvement measures to the persons concerned with USE and the public.

O.1.2 Contents of the Pilot Projects

a. Planning

Since "*New Municipal SW Landfill Establishment Plan*", "*SW Collection System Improvement Plan*" and "*Model Communities Integrated USE Improvement Plan*" were identified as first priority projects and were subject to F/S.

The Team and the counterparts recommended and proposed five pilot projects as follows, in order to comply the objectives mentioned above (Refer to Figure O-1 for the overall plan of pilot projects).

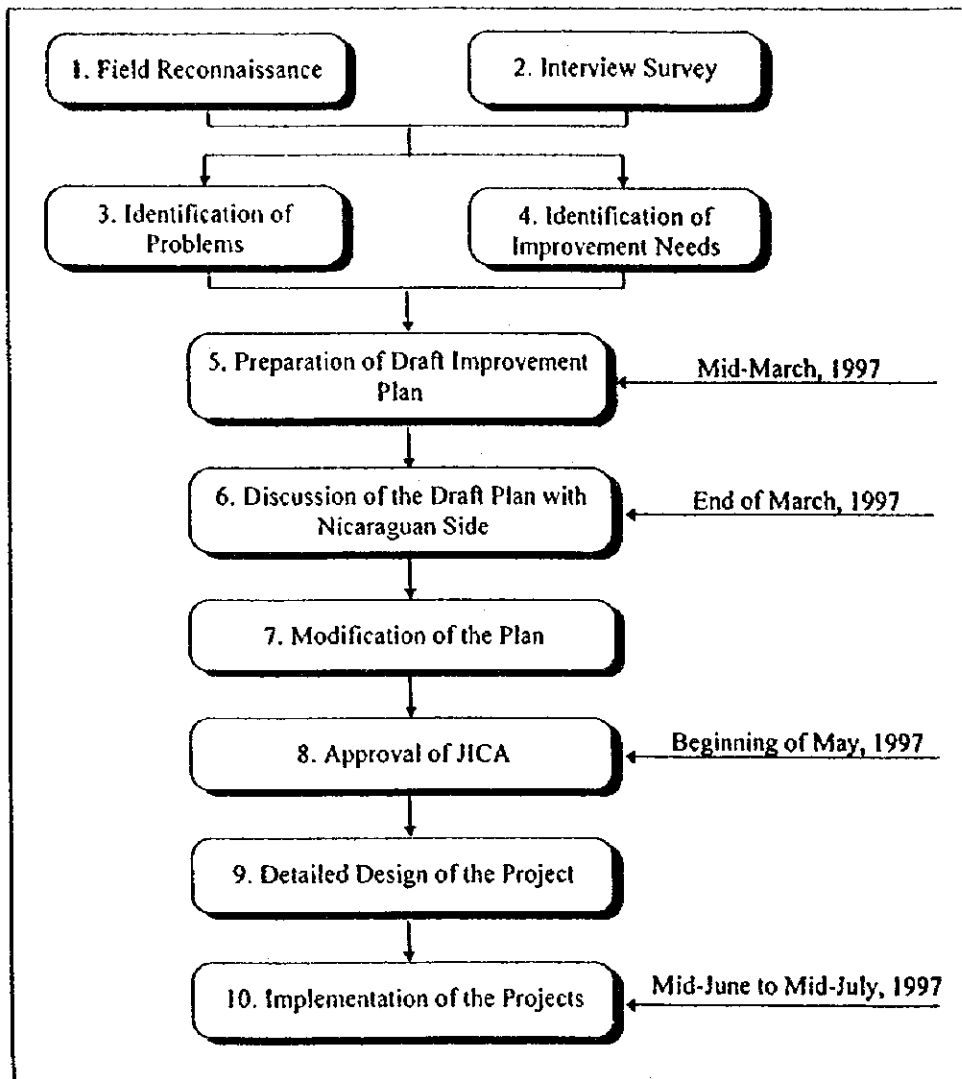


Figure O-1: Total Plan of Pilot Projects

a.1 Beautify Granada Campaign

In order to examine the methodologies to enhance the public awareness and co-operation on USE improvement, a set of public campaigns on USE improvement shall be carried out. These campaigns should be promoted in closer linkages with other projects listed below (a.2 to a.5) as much as possible. Workability of the public education program to be proposed in M/P should be examined through these campaigns. Furthermore, data related with F/S should also be collected along with the campaigns.

a.2 Experiment on Improvement of Refuse Collection System

In order to examine appropriate and reliable SW collection system for the areas where presently such services are insufficient or not provided (e.g., Eddy Ruiz III), an experiment on improvement of refuse collection system will be carried out. Workability of systems to be proposed in M/P are to be examined through this experiment and data necessary for preliminary designs in F/S are to be collected.

a.3 Experiment on Improvement of Arroyo Zacatiligue

Illegal dumping along arroyo in Granada deteriorates the sanitary environment of the City and the lake. The experiment takes place at Arroyo Zacatiligue (as a model arroyo) for activities of removing of illegally dumped waste and provision of collection services (with waste collection bays) in order to prevent illegal dumping along the arroyo. Workability of systems to be proposed in M/P are to be examined through this experiment and data necessary for preliminary designs in F/S are to be collected.

a.4 Experiment on Sanitary Landfill Operation at La Joya Disposal Site

Experiment on sanitary landfill operation is to be carried out at La Joya disposal site in order to obtain data necessary for the priority project of "New Municipal SW Landfill Establishment Plan". (Refer to Figure O-2)

a.5 Experiment on Sullage Collective Treatment System

A model area is selected for this experiment from the areas where sewer service will not be provided by the year 2010. A sullage collective treatment system is to be installed in the model area in order to collect data necessary for examining the optimal technical systems to be employed in the priority project (i.e., Model Community Integrated in USE Improvement Plan) and also a community participation system which is necessary for the operation and maintenance of the collective system shall be studied (Refer to Figure O-3).

In short, relation of the five pilot projects and the three first priority projects subject to F/S is summarized as follows:

- "Experiment on Improvement of Refuse Collection System" and "Experiment on Improvement of Arroyo Zacatiligue Sanitation Environment" are to be implemented with regard to the priority project: "*Municipal SW Collection System Improvement Plan*".
- "Experiment on Sanitary landfill Operation at La Joya Disposal Site" is required for the examination of the priority project: "*New Municipal SW Landfill Establishment Plan*".

- “Experiment on DWW Collective Treatment System” is necessitated for the examination of the priority project: *“Model Communities Integrated USE Improvement Plan”*.
- “Beautify Granada Campaign” is indispensable in view of public awareness enhancement and citizens’ participation in the USE improvement.

The five pilot projects proposed were approved by JICA. Figure O-4 shows locations of the pilot projects. Details of the five pilot projects and roles and burden sharing by both Nicaraguan side and the Team are described in the following sections.

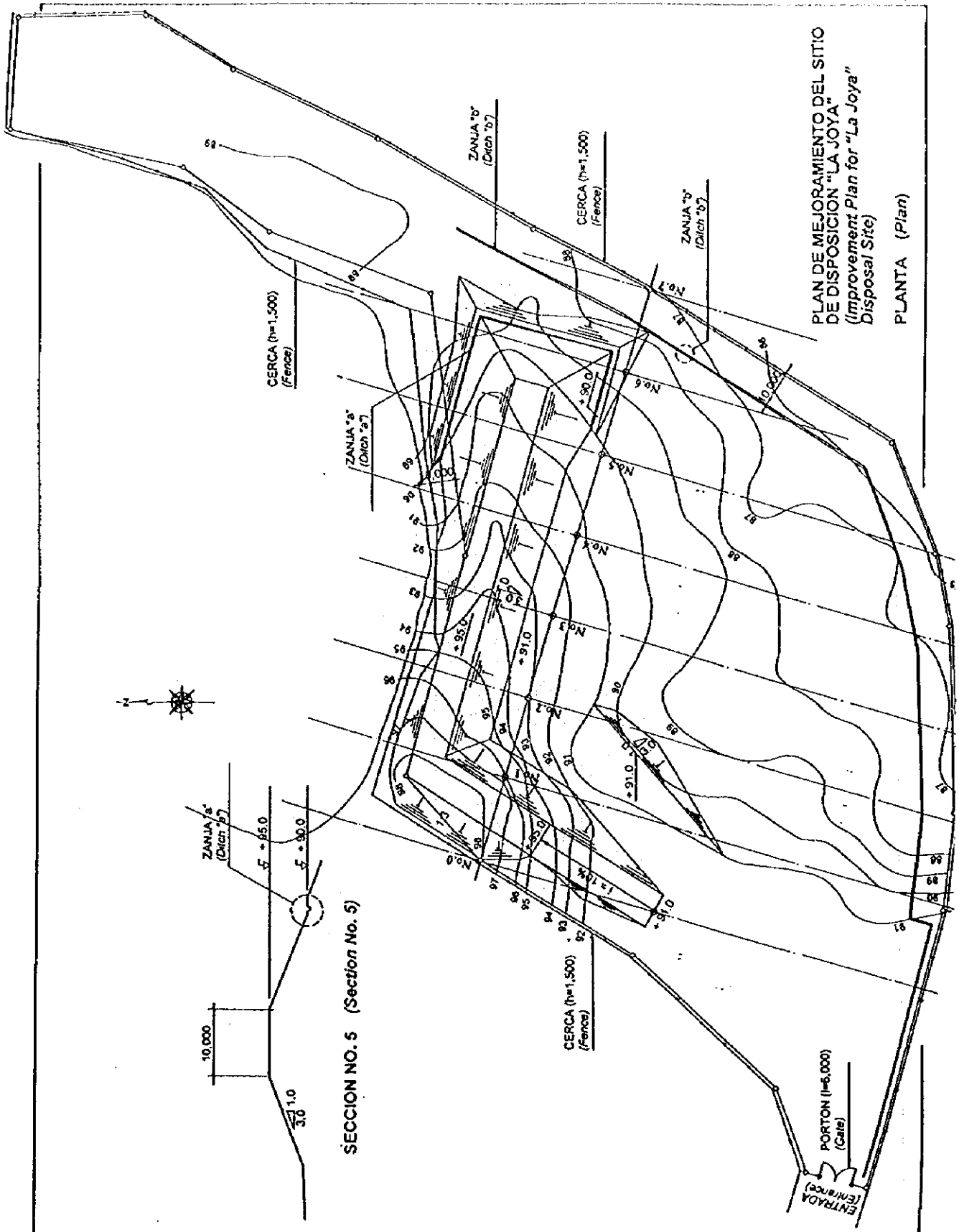


Figure O-2: Experiment on Sanitary Landfill Operation at La Joya Disposal Site

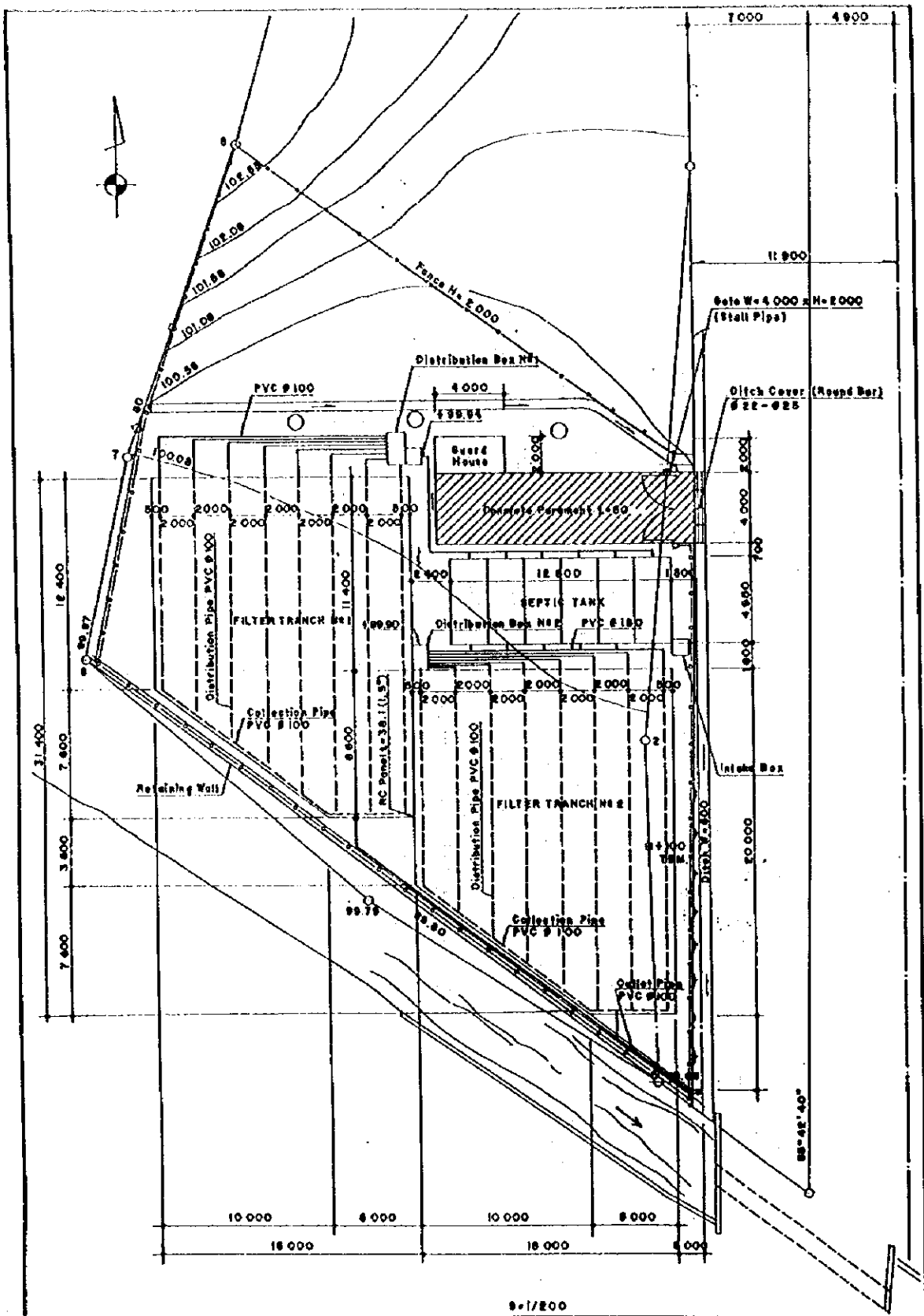


Figure O-3: Experiment on Sullage Collective Treatment System

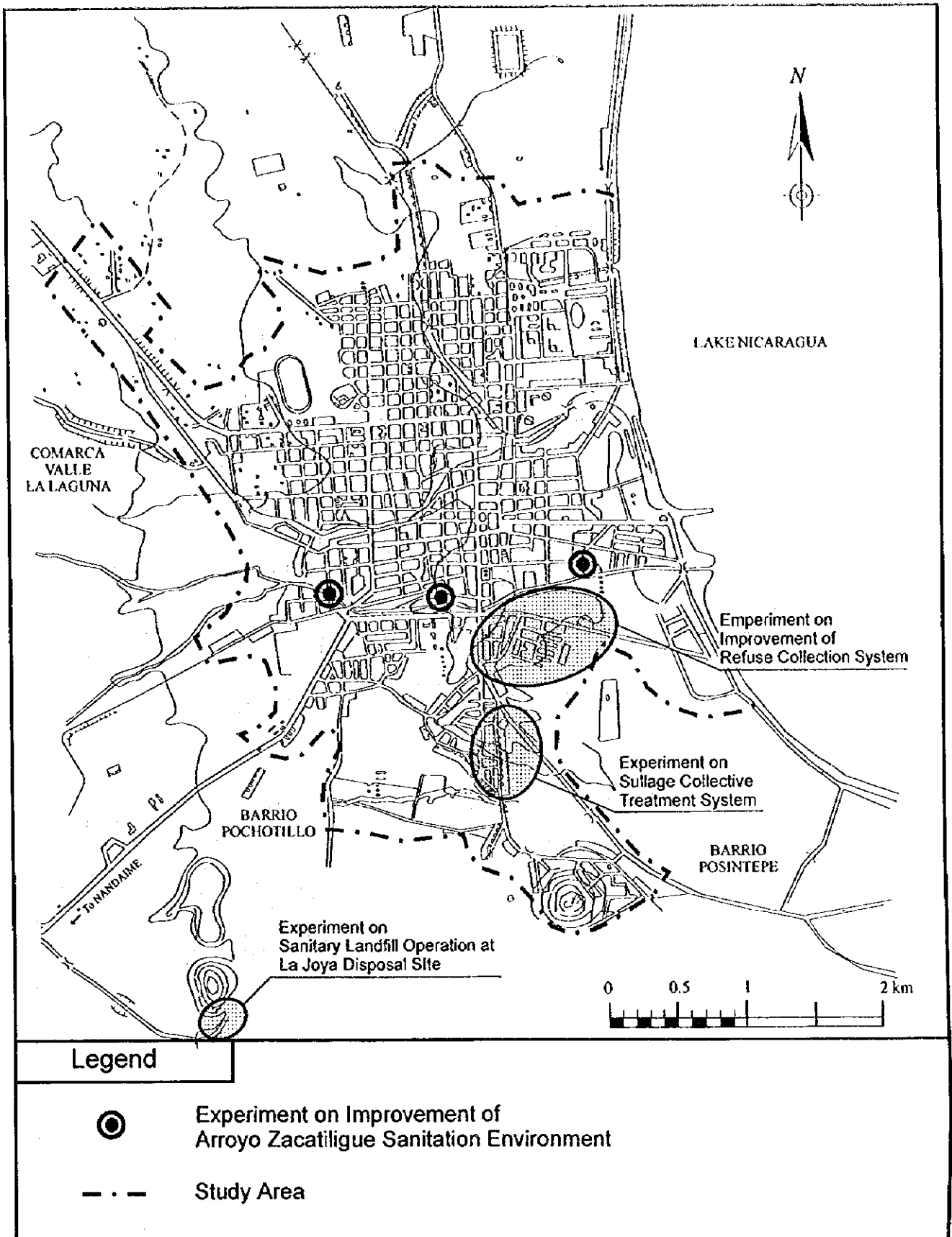


Figure O-4: Location of the Pilot Projects

b. Roles of the Each Entities in the Pilot Projects

Pilot projects require definite effects within short period time of three months obtaining necessary data to implement F/S . Therefore, active participation/burden sharing and leadership by the Nicaraguan side is indispensable. In this context, the Study Team planned to implement pilot projects based on the role assignment summarized in the table below, leading roles by Nicaraguan side and the supporting roles by the Study Team.

Table O-1: Responsibilities for the Pilot Projects

Pilot Project	Nicaraguan Side	Team
1. Beautify Granada Campaign	<ol style="list-style-type: none"> 1. Planning and design of signboard, poster, sticker, seminar/workshop. 2. To provide speaker car and to implement the public campaign activities. 3. To implement seminars and workshops on sanitary education. 	<ol style="list-style-type: none"> 1. To support the planning and design to be prepared by the Nicaraguan side. 2. To provide signboard, poster, sticker. 3. To support the arrangement of seminars and workshops on sanitary education. 4. To implement questionnaire surveys before and after the experiments.
2. Experiment on Improvement of Refuse Collection System (Eddy Ruiz III)	<ol style="list-style-type: none"> 1. To provide speaker car and to implement the public campaign activities. 2. To request community co-operation for placing waste at designated location. 3. To provide regular waste collection services for the area. 4. To bear cost for operation and maintenance of the tipper lorry provided for the experiment (including fuel). 	<ol style="list-style-type: none"> 1. To prepare a plan of Eddy Ruiz III refuse collection improvement. 2. To provide a waste collection vehicle and waste containers. 3. To construct of waste collection bays. 4. To implement questionnaire surveys before and after the experiments.
3. Experiment on Improvement of Arroyo Zacateligue Sanitation Environment	<ol style="list-style-type: none"> 1. To provide speaker car and to implement the public campaign activities. 2. To request community cooperation for placing waste at designated location instead of illegal dumping. 3. To enforce monitoring and restriction to prevent illegal dumping. 4. To provide regular waste collection services for the area. 	<ol style="list-style-type: none"> 1. To prepare plans of "illegal dumping areas improvement" and "refuse collection improvement". 2. To provide a waste collection vehicle (co-use with Eddy Ruiz III) and waste containers. 3. To remove illegal wastes dumped and to construct waste collection bays. 4. To implement questionnaire surveys before and after the experiments.
4. Experiment on Sanitary Landfill Operation at La Joya Disposal Site	<ol style="list-style-type: none"> 1. To implement public campaign regarding the sanitary landfill experiment. 2. To control vehicles entering the site and their waste disposal at the site. 3. To continue sanitary landfill operation after the improvement (after September 1997). 	<ol style="list-style-type: none"> 1. To implement works of urgent improvement for the present La Joya disposal site and works of environmental protection. 2. To prepare a manual of sanitary landfill operation. 3. To implement questionnaire surveys before and after the experiments.

Pilot Project	Nicaraguan Side	Team
5. Experiment on Sullage Collective Treatment System	<ol style="list-style-type: none"> 1. To acquire the land for the facility construction (Reparto Adelita II). 2. To obtain permits for the works. 3. To formulate and obtain a consensus from the community for connecting the sullage generated to the treatment system and a consensus regarding operation and maintenance of the system. 4. Operation/maintenance and monitoring of the experimental system. Results of the monitoring should be presented at the technology transfer seminar in 4th Study Work in Nicaragua. 5. Connection of sullage from houses subject to the experiment. 6. To prepare a plan of community participation for construction, operation and maintenance of the sullage collective treatment system. 	<ol style="list-style-type: none"> 1. To construct sewer lines for the experiment 2. To plan, design and construct the sullage collective treatment system. 3. To examine optimum operation and maintenance measures and to prepare the manual. 4. To support planning of "community participation system" for the construction, operation and maintenance of the sullage collective treatment system. 5. To implement questionnaire surveys before and after the experiments.

c. Implementation of Pilot Projects

The pilot projects below were carried out with close cooperation between counterpart and the Study Team in the 3rd Study Work period in Nicaragua (June to August 1997).

Table O-2: Contents of Pilot Projects

Pilot Project	M/P's Recommendation for Improvement	Related Projects subject to F/S	Contents of Pilot Project
1. Beautify Granada Campaign	<ul style="list-style-type: none"> • Promotion of public awareness and citizens' co-operation • Providing sanitary education 	<ul style="list-style-type: none"> • A New Municipal SW Disposal Site Development Project • Refuse Collection System Improvement Project • Model Communities Integrated USE Improvement Project 	<ul style="list-style-type: none"> • Holding a poster contest • PubliCity work using signboards, placards, posters, stickers, and car speakers • Holding seminars and workshops on sanitary education
2. Experiment on Improvement of Refuse Collection System	<ul style="list-style-type: none"> • Expanding waste collection service by "point collection system" • Securing citizens' co-operation for the waste collection service 	<ul style="list-style-type: none"> • Refuse Collection System Improvement Project • Model Communities Integrated USE Improvement Project 	<ul style="list-style-type: none"> • Constructing 6 waste collection bays and installing 40 waste containers • Expanding publiCity and providing public education • Providing punctual periodical waste collection service
3. Experiment on Improvement of Arroyo Zacateligue Sanitation Environment	<ul style="list-style-type: none"> • Elimination of illegal dumping • Improvement of waste collection service by "point collection system" • Securing citizens' co-operation for the waste collection service 	<ul style="list-style-type: none"> • Refuse Collection System Improvement Project 	<ul style="list-style-type: none"> • Removing illegally dumped waste and cleaning the arroyo • Constructing 4 waste collection bays and installing 20 waste containers • Expanding publiCity and providing public education • Providing punctual periodical waste collection service

Pilot Project	M/P's Recommendation for Improvement	Related Projects subject to F/S	Contents of Pilot Project
4. Experiment on Sanitary Landfill Operation at La Joya Disposal Site	<ul style="list-style-type: none"> Construction of a sanitary landfill disposal site 	<ul style="list-style-type: none"> A New Municipal SW Disposal Site Development Project 	<ul style="list-style-type: none"> Accumulation, shaping and compaction of waste, soil coverage, construction of drainage channels Installation of gas removal pipes and fence Improvement of access road
5. Experiment on Domestic Waste Water Collective Treatment System	<ul style="list-style-type: none"> Establishment of domestic wastewater treatment system for no sewer projected area 	<ul style="list-style-type: none"> Model Communities Integrated USE Improvement Project 	<ul style="list-style-type: none"> Construction operation and maintenance of domestic wastewater collective treatment system including sewer piping and household connections Expanding publicCity and providing public education

b. Implementation Schedule of the Pilot Projects

The five pilot projects were implemented in accordance with the schedule below.

Table O-3: Implementation Schedule of the Pilot Projects

	June		July					August				
	3W	4W	1W	2W	3W	4W	5W	1W	2W	3W	4W	5W
Beautify Granada Campaign												
Questionnaire Survey	■					■				■		
Implementation		■	■	■	■	■	■	■	■	■	■	■
Experiment on Improvement of Refuse Collection System												
Questionnaire Survey		■						■				
Implementation			■	■	■	■	■					
Experiment on Improvement Arroyo Zacatelique Sanitation Environment												
Questionnaire Survey		■						■				
Implementation			■	■	■	■	■					
Experiment on Sanitary Landfill Operation at La Joya Disposal Site												
Questionnaire Survey		■								■		
Implementation			■	■	■	■	■	■	■	■	■	■
Experiment on Domestic Waste Water Treatment System												
Questionnaire Survey		■										■
Implementation			■	■	■	■	■	■	■	■	■	■
Operation											■	■