

O.2 Beautify Granada Campaign

O.2.1 Background and Preliminary Plan

a. Background

In view of current problems, i.e. illegal waste dumping in rivers, regarding USE in Granada, public awareness on the importance of USE should be heightened to gain public cooperation.

b. Objectives

The objectives of the "Beautify Granada Campaign" are:

- To enhance public awareness on USE.
- To introduce public cooperation as a means of keeping the City clean.
- To formulate and conduct public education programs on USE.

c. Draft Improvement Plan

The following campaign will be conducted along with other pilot projects:

- Public campaign through posters, stickers, signboards, placards, distribution of T-shirts and caps, slogans, pamphlets, broadcast canvassing, etc.;
- Sanitation education workshops by Counterpart members; and
- Formulation of public education programs

d. Roles of Relevant Organizations

As stated below, the public campaign shall be planned and implemented by the Municipal Government of Granada (MGG) with the cooperation of related agencies (MINSA-SILAI, INAA, MARENA, MED) and the citizens. The Team will support the MGG in the campaign, as well as supervise and evaluate the project.

The roles of the relevant organizations in the campaign project are shown in Table 3-3.

Table O-4: Roles of Relevant Organizations in the "Beautify Granada Campaign" Project

Organizations	Roles
JICA	<ul style="list-style-type: none"> • Approval of the plan • Allocation of budget for a part of the campaign
Granada Municipality	<ul style="list-style-type: none"> • Planning and preparation of the campaign • Implementation of workshops on public education and cooperation • Drafting public education programs • Enforcement of relevant USE regulations
MINSA, SILAIS Granada	<ul style="list-style-type: none"> • Planning and preparation of the campaign • Implementation of workshops on public education and cooperation • Drafting public education programs

Organizations	Roles
Study Team	<ul style="list-style-type: none"> • Preparation, supervision and evaluation of the project • Support the Municipality in the conduct of public education and cooperation campaigns
Citizens	<ul style="list-style-type: none"> • Cooperation in clean-up operations

e. Expected Benefits

The following benefits are expected through the implementation of the Project:

- Improved aesthetic environment as well as sanitary conditions.
- Increased public awareness and public participation and cooperation.
- Technology transfer regarding the improvement of the sanitary conditions of the City through public campaign, sanitary education workshops and public education programs.

O.2.2 Preparation of Beautify Granada Campaign

The campaign project was implemented in the City of Granada from the end of June until the end of July 1997 by the Counterpart with the support of the Team. During the experiment, the following activities were carried out in order to examine the feasibility of the proposed plan:

- Observe the change in degree of public awareness before and after the campaign.
- Check the adaptability of the proposed campaign tools and the proposed USE plan in the clean-up experiment.

a. Relevant Organizations for the Campaign

In order to guarantee the smooth conduct and success of the project campaign, a series of meetings and discussions were carried out by the relevant organizations shown below:

- MGG (Municipal Government of Granada)
- MINSA-SILAI (Ministry of Health-Local Systems of Integral Attention and Health)
- INAA (Nicaraguan Institute of Waterworks and Sewerage)
- MARENA (Ministry of Environment and Natural Resources)
- MED (Ministry of Education)
- NGO - WV WV (Non Governmental Organization-World Vision)
- Communal Groups, etc.

Moreover, to implement the public campaign, a series of workshops on "the Improvement of Urban Sanitation Environment in the City of Granada" were conducted by the Counterparts with the Team's support. These workshops, described in detail in later sections, consist of the following:

- Brief description of present sanitary conditions and management of solid waste and wastewater.
- Presentation of pilot projects.

- Site visits by community leaders to confirm the present situation of the municipal landfill site and pilot projects areas .
- Institutional meetings in order to establish joint actions. Question and answer session.

b. Citizen's Training

Direct training of the citizens or conduct of community programs shall relay relevant knowledge to the population. This training was the most important public education method to start in selected sectors of the City.

Training methods used in these sectors were the following:

- Town meetings
- House visits
- Mini-workshops
- Visit to pilot project areas by the community leaders of beneficiary and non-beneficiary areas

These training activities were conducted within a month by the Counterpart and the Team, and were reinforced through additional publicity by means of posters, stickers, distribution of T-shirts, caps, broadcast canvassing, slogan placards, etc., as shown in the Table below.

Table O-5: Community Meetings and Training Programs

Activity	Place	Participants	Responsible Organ
Town Meetings	Bo. El Bolson, El Resbalon, Talpujera, La Sirena	Citizens of each sectors, and community leaders	MGG, MINSA-SILAIS
House Visits	Bo. El Bolson, El Resbalon, Talpujera, La Sirena	Family members	MGG, MINSA-SILAIS
Mini-Workshops	Bo. El Bolson, El Resbalon, Talpujera, La Sirena	Citizens	MGG, MINSA-SILAIS, INAA, MARENA

Meetings with the community and education workshops are detailed further ahead.

c. Preparation Works for Beautify Granada Campaign

The following preparation works were executed in June 1997 prior to the commencement of the experiment.

- Explanation of the purpose and detailed plan of pilot projects to relevant organizations;
- Explanation of the purpose and detailed plan of pilot projects and collection experiment to community leaders and residents;
- Encouragement of the residents through the community leaders to participate in the clean-up operations;

- Implementation of sanitary education workshops and cooperation campaign (by the Counterpart with the Team's support);
- Holding a public poster/sticker contest on USE

d. Poster/Sticker Contest

As stated previously, public cooperation and participation are fundamental to the accomplishment of the goals related to USE improvement in Granada. Therefore, for the implementation of the campaign, MGG carried out a public poster and sticker making contest inviting the entire citizens of Granada. This contest was the first step towards encouraging public participation and improving public consciousness, as well as being, during the Study, the first public contribution to the improvement of the City environment.

The posters submission date was set at the beginning of June 1997. The selection criteria were originality, neatness, creativity, design colors and identification with campaign objectives and Granada City. Among the posters submitted (35 participants), the most descriptive designs were chosen and prizes were awarded to the first, second and third places. Special mention was also given to three of the posters submitted by children participants. These three special mentions were also awarded prizes.

The first prize was awarded to the poster of a small shark in nappies, which is a legendary sweet water shark in Lake Nicaragua, with the following slogan:

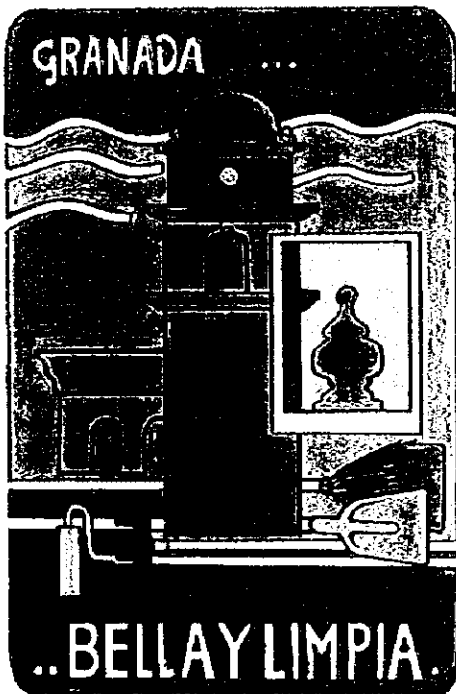
**“Trabajemos juntos para una Granada mas limpia”
 (“Working together for a cleaner Granada”)**

All the design works were exhibited in the “Casa de los Leones” of the municipality of Granada.

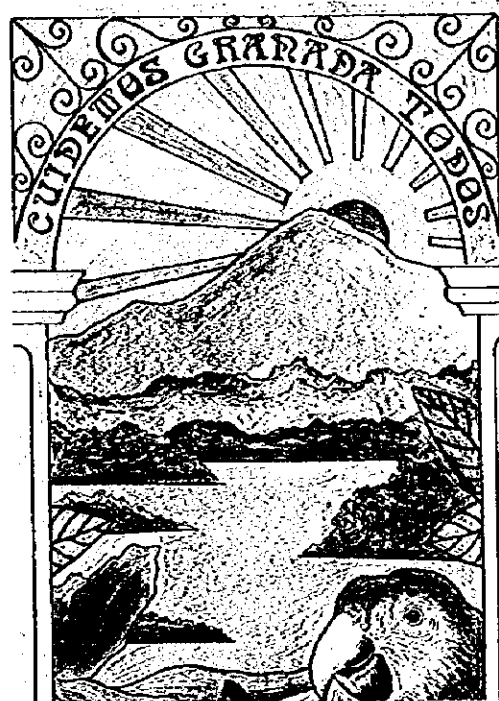
The winning posters including those given special mention are shown below:



First Prize



Second Prize



Third Prize

Figure 3-2: Winning Posters

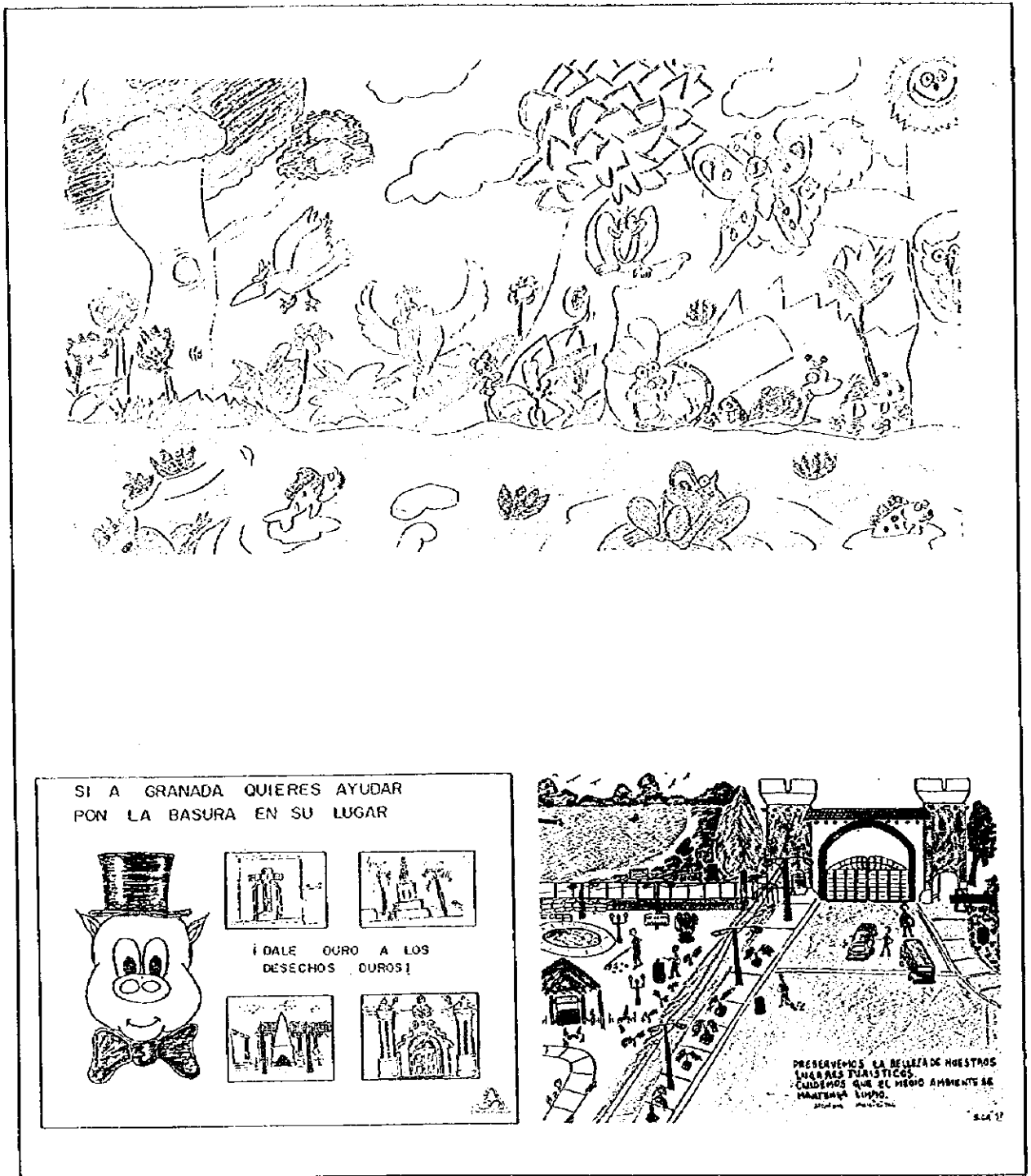


Figure 3-3: Special mentions awarded to children from schools



Plate O-1 : Campaign Poster (1st Prize)



Plate O-2 : Commendation Ceremony (Opening)



Plate O-3 : Commendation Ceremony (1st Prize Winner)



Plate O-4 : School Section Prize Winner

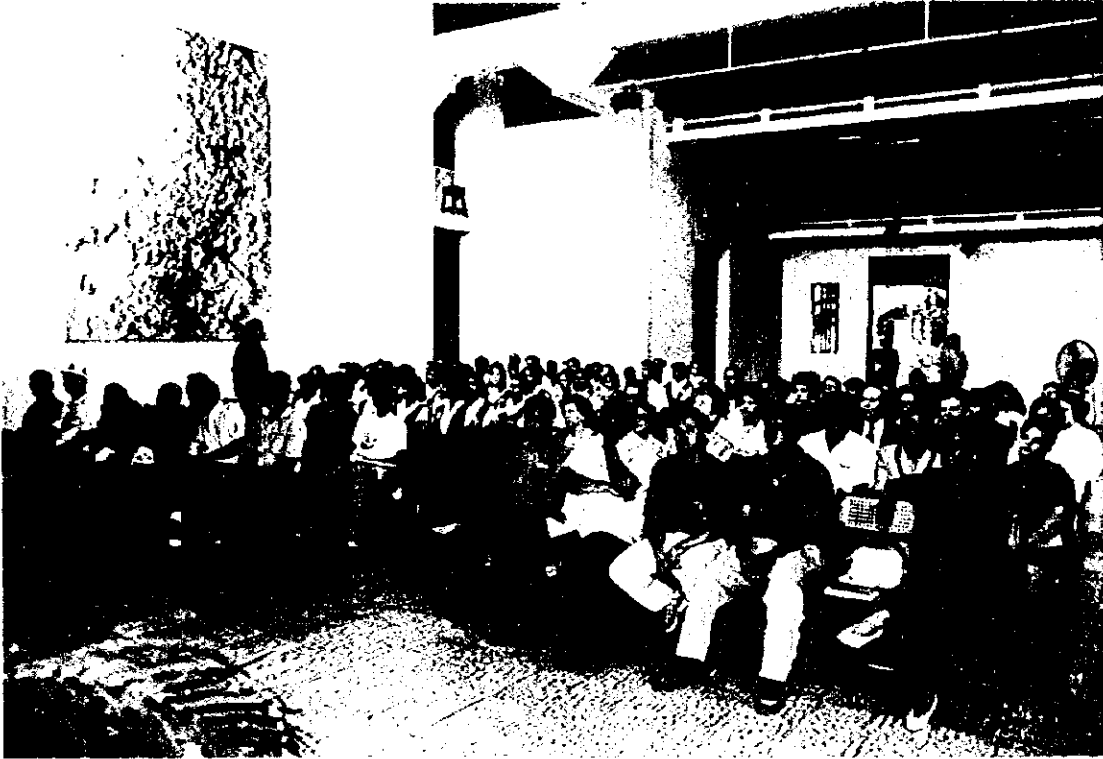


Plate O-5 : Commendation Ceremony (Audience)



O.2.3 Execution of the Campaign

a. Schedule for the Implementation of Beautify Granada Campaign

Beautify Granada Campaign activities were executed according to the schedule shown in the table below.

Table O-6: Schedule for the Campaign Project in June

Activities	Month (June)																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	
1. City reconnaissance for quest. survey																															
2. Selection of areas for quest. survey																															
3. Site visit (Advisory Committee & Team)																															
4. Broadcasting by speaker cars (for POS)																															
5. Selection of poster / sticker contest																															
6. Preparation/distribution of poster/sticker/others																															
7. Public opinion survey (whole City and p.p. areas)																															
8. Broadcasting by speaker cars (for campaign)																															
9. Meeting with community leaders/by towns																															
a. Barrio Eddy Ruiz III																															
b. Barrio La Tapuljera (Bilbao)																															
c. El Bolson																															
10. Signboards (50)																															
a. Fabrication																															
b. Installation																															

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	
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c. El Bolson																															
10. Signboards (50)																															
a. Fabrication																															
b. Installation																															

Table O-7: Schedule for the Campaign Project in July

Activities	Month (July)																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	
1. Meeting with community leaders/residents by towns																																
a. Adelfita # 1																																
b. Eddy Ruiz (houses distrib. per bay)																																
c. Resbalon (")																																
d. La Tapujera (Bilbao) (")																																
2. Distribution/placing of poster/sticker																																
3. Broadcasting by speaker cars (campaign)																																
4. Meeting Counterpart - JICA Team																																
5. Meetings and workshops for the community																																
6. Cleansing day activity																																
a. Barrio El Bolson																																
b. Eddy Ruiz																																
c. Barrio La Tapujera																																
d. El Resbalon																																
e. Nicaragua coastal area																																
f. Others (Barrio San Alejandro)																																
7. Improv. of access road to pilot proj. areas																																
8. Implementation of seminar																																
9. Quest. survey (After)																																
10. Implementation of cultural / sport events																																
11. Manual for the community																																
12. Installation of signboards and placards																																

Table O-7: Schedule for the Campaign Project in July

Activities	Month (July)							18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Tu	We	Th	Fr	Sa	Su	Mo														
1. Meeting with community leaders/residents by towns																					
a. Adelfa # 1																					
b. Eddy Ruiz (houses distrib. per bay)																					
c. Resbalon (")																					
d. La Tapujera (Bilbao) (")																					
2. Distribution/placing of poster/sticker																					
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11. Manual for the community																					
12. Installation of signboards and placards																					

b. Campaign Methods

b.1 General

The public campaign consists of attempts to improve individual, group and communal behavior with regard to solid waste and wastewater disposal through meetings, lectures and publications, in order to prevent diseases, and protect and improve public health. However, in Granada, as in most Nicaraguan cities, public sanitary education has always been a response to urgent issues affecting the population rather than a long term goal. Governmental organizations lack resources, justifying the use of funds only when the issue in question has immediate and serious physical and political consequences.

As in Managua City, most educational techniques widely utilized in other countries to transmit campaign messages to the public are ineffective in Granada. The low literacy rate and the municipal government's lack of economic resources have particularly rendered such techniques that are appealing to the moral values of the society useless.

Therefore, the public campaign must put emphasis on fear. They must instill fear in the minds of the population regarding the consequences for the disregard of campaigns and its measures. On the other hand, the campaign must contain a positive message, because a campaign based solely on fear can create panic and disturb the USE improvement in City of Granada.

b.2 Campaign Tools

The following are the campaign tools used in the "Beautify Granada Campaign" to promote public awareness and cooperation:

Table O-8: Campaign Tools

Campaign Tools	Remarks
Signboards	Signboards with posters were installed at 50 places in the City to promote USE improvement in Granada.
Posters	3000 posters were distributed among institutions, commercial establishments, schools, community leaders and residents, to promote USE improvement.
Stickers	Stickers are very effective to promote USE improvement because they reach a large segment of the population. These stickers were distributed to institutions, commercial establishments, cars, buses, taxis, etc.
Seminar	To be implemented by the Counterpart in mid-August 1997

As stated in the Table above, signboards with posters were installed at 50 places in the City, and 7 placards with the campaign message were placed at different locations to promote the Beautify Granada Campaign as shown in the Figure below.

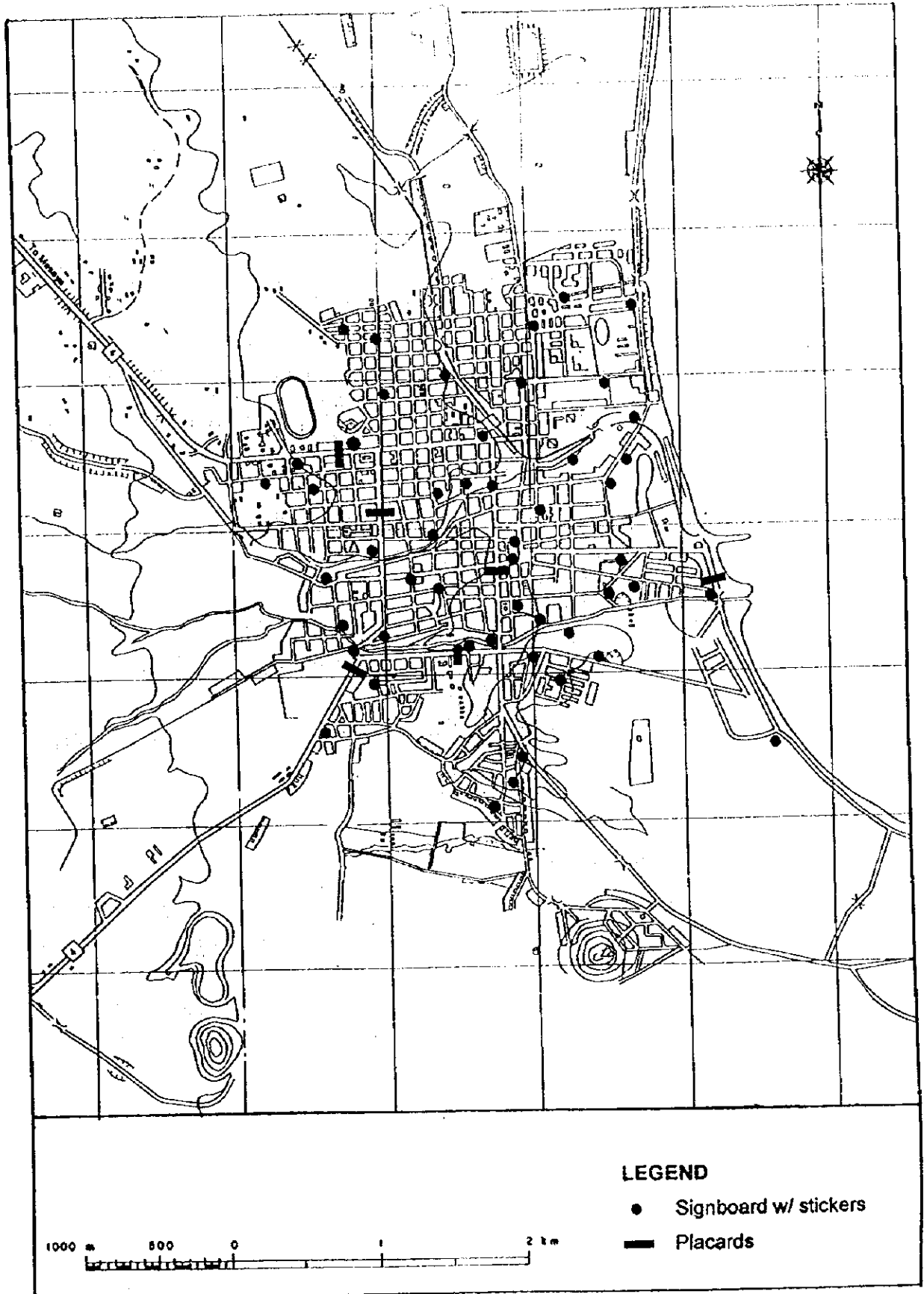


Figure O-5: Location of Signboards and Placards

b.3 Other Campaign Tools

As previously mentioned, the purpose of the public education campaign is to promote public awareness and cooperation. In this sense, and because of the importance of the active participation of the whole population and the relevant organizations involved, the Team requested the Municipal Government of Granada (MGG) to plan and implement the campaign. The Counterpart proposed the following methods and campaign tools, which were implemented with the Team's support:

Table O-9: Other Campaign Tools Proposed and Implemented by MGG

Other Campaign Tools	Necessity
Mass media diffusion through advertising and press releases (TV, radio, newspapers, magazines)	Targeting the general public or large segments of the population. This method is very effective in the long run because it reaches a great number of people at the same time
Booklets	Complementary tool for the education program; to be used for community lectures.
T-shirts and hats	In a country with scarce economic, cultural and technical resources such as Nicaragua, distribution of these items are very welcome and will promote the campaign.
Music festival and/or sport events	Festivals are likely to encourage the public to participate, attend and promote campaign activities, especially in a country like Nicaragua.
Meeting with community leaders and residents	In the pilot project, the purpose of the education program is not only to increase public awareness on USE improvement issues, but also to promote the experimental clean-up operation and gain the support and participation of the community involved.

MGG was considered incapable of implementing all the proposed methods due to lack of funds, but with the cooperation of relevant organizations (MINSALSA, INAA, MARENA, MED) and other institutions such as NGO's, schools, as well as the beneficiaries, most of these methods could be realized.

c. Meeting with Community Leaders and Residents

Public sanitary education through community meetings was carried out by the Counterpart with the Team's support as part of the pilot projects, and separately as a public education campaign program.

In the collection experiment, the purpose of the education program is not only to increase public awareness on USE improvement issues, but also to promote the collection experiment itself and gain the support and participation of the community.

c.1 Community Comments

Eddy Ruiz III (Attendance : 35 persons)

This is the area that is going to benefit most from the experimental waste collection service. People from this area demonstrated much interest and were grateful to be selected as an experimental area. However, only a few of the residents willingly cooperated.

El Bolson (Attendance: 20 persons)

One of the poorest areas in the City. This settlement, located along the Arroyo Zacateligue, was expropriated from its former owners and is still undergoing land ownership problems. The major problem of this area is the lack of latrines. Therefore, the installation of this basic utility is prioritized over the conduct of waste collection services. Nonetheless, the inhabitants are willing to cooperate with the experimental waste collection service planned in this area.

La Talpujera (Attendance 25 persons)

As in Eddy Ruiz, the residents of this area demonstrated much interest and were grateful to be selected as an experimental area. However, they were passive with respect to the actual conduct of the project.

El Resbalon (Attendance: 15 persons)

According to the comments of the community, education should be improved first before implementing any collection experiment. This is probably due to the inappropriate use of the waste bay. This is also considered important in view of the attitude of the waste collectors who, instead of collecting waste, are littering the streets.

50% of the residents agreed to cooperate with the experimental waste collection service.

La Sirena (Attendance: 16 persons)

One of the most cooperative *barrios*. The people in this area are willing to appropriately use the waste bay and keep the area clean. The community itself has started its own cleaning activities, targeting its vicinity and areas along roads.

La Adelita (Attendance : 25 leaders and residents)

The community was very grateful for the cooperation extended by the Japanese Government, and are willing to maintain the treatment plant and cooperate in keeping the area clean.

The community said that the waste collection service is insufficient, and requested the Municipality to provide some equipment to execute clean-up activities.

d. Clean-up Operation

d.1 Objectives of the Experiment

The experiment aims to demonstrate the impact of sanitation improvement along the Arroyo Zacateligue by executing a clean-up operation, and obtain basic data for the preliminary design of the feasibility study. The experiment will help the Granada residents further understand the significance of sanitation problems and to enhance public awareness and encourage public cooperation in USE improvement. Moreover, it will help change people's behavior toward proper waste management habits, and promote cooperation for the conduct of SWM activities and USE improvement.

d.2 Clean-up Operation

The experiment was carried out in July 1997, every week, along Arroyo Zacateligue, where the neighborhood is large. The selection of this area was also based on its adverse impact on the surrounding, being the largest receiver of waste amount.

During this month, clean-up operations were carried out on three Saturdays and one Friday in El Bolson, La Talpujera, El Resbalon and the coastal areas of the lake, along Arroyo Zacateligue and Lake Nicaragua.

More than one hundred people participated and cooperated in the clean-up operations. The experiment was carried out with the participation of Counterparts from MGG, MINSA-SILAIS, MARENA, MED, students from several schools, community residents and volunteers.

Upon consideration of the campaign objectives, the main emphasis of the clean-up operation was to gain the interest of the citizens. Many residents and students participated enthusiastically in the clean-up operation, and the younger members, particularly high school students, were the most cooperative. The positive response from the youth during the cleaning activities helped affirm, to a certain degree, that the clean-up operation organized and implemented by the Counterpart with the Team's support would be very effective to enhance public awareness and encourage public cooperation.

The campaign activities consisted of the following:

- Broadcast canvassing before and during the clean-up operation day to solicit cooperation in the conduct of the cleansing activities.
- Resident participation (approximately 30 persons), participation of about 100 students from various City schools, with the support of MGG, MINSA-SILAIS and the Team.
- Use of a waste collection vehicle, a dump truck, a wheel loader, a motor grader, and tools: shovels, hackles, refuse bags, "machetes", gloves, etc.

At the beginning of the clean-up operations, the activities were conducted disorderly due to the large number of participants. However, the operation was about 80% satisfactory, and the objectives of the campaign to introduce public cooperation and participation were successfully attained.

Table O-10: Clean-up Operation along Arroyo Zacateligue and Lake Nicaragua

Area	Participants				Cooperation from the area	Work performance	Clean-up condition	General Impression
	Residents	Students	Institutions	Total				
El Bolson	25	90	6	121	Very good	Good	80%	Very good
La Talpujera	30	70	5	105	Good	Good	80%	Very Good
Eddy Ruiz								
El Resbalon	5	70	2	77	Average	Average	70%	Average
Coastal area	45	100	3	148		Very good	85%	Very good
Others El Rosario								Proposed

d.3 Selected Areas for Clean-up Operations along Arroyo Zacateligue

Clean-up operations were carried out along Arroyo Zacateligue, particularly in El Bolson (about 300m), Talpujera (about 200m), Eddy Ruiz III, and along the coastal area

of Lake Nicaragua (900 m). Also, residents outside of the pilot project areas, e.g. El Rosario, proposed the independent conduct of clean-up operations.

The location of areas subject to the clean-up operation is shown in Figure 3-5.



Figure O-6: Location Map of Clean-up Arroyo Zacateligue Project

e. Public Education Campaign

e.1 General

Generally public education methods are divided into campaigns targeting the general or large segments of the population, as well as the limited and confined target groups. The first method mainly utilizes the mass media, while the second concentrates on reaching specific groups through designed campaigns, events and lectures.

The techniques to reach limited target groups are endless and are generally divided between those targeting area groups, i.e. community centers, neighborhood associations, sport clubs and so forth, and those targeting social groups determined by such things as age, gender and religion, i.e. schools, women associations, churches, etc.

In targeting area groups, the goal is to focus the issue on its effects on the residents, thus appealing to the sense of community and brotherhood, creating a sense of awareness in which the residents of a certain area influence and control each other to change and/or modify inadequate habits. The problem with this method is finding a proper way to transmit the idea, because the educational level and the attention span of the average citizen is very limited.

Social groups have the obvious advantage of having very narrow and precise target audience.

For the public USE education campaign, it would be best to utilize as many techniques as possible to evaluate their effectiveness. However, it must keep in mind that since in this particular case the campaign is a pilot project, the education methods must be selected based on their effectiveness in reaching determined target groups rather than in changing general customs and behaviors, so that its effects can be properly evaluated in the study.

Therefore, the techniques selected for the USE improvement education experiment concentrate on meetings with the communities and lecturing at educational workshops.

e.2 Educational Workshop

The general objectives of the educational workshops are: to instruct and promote basic knowledge of sanitation problems to the population and to develop attitudes and practices related to the management of solid waste and wastewater.

Specific objectives of the above workshops are set as follows:

- To explain the magnitude and urgency of the USE improvement in the City of Granada providing the basic means to adequately manage solid waste and wastewater.
- Stress the benefits of an adequate USE improvement and the harm that improper USE may incur on public health, welfare and the environment as related to the daily life of the general population.
- Point out that only through the active participation of the whole population can the problems related with USE in the community be solved.
- Underline the costs involved in SWM as a public service, and that improper waste management habits, i.e. illegal dumping, increase SWM costs, reduce SWM

efficiency, etc. Also, explain the problems faced by the Municipality in extending services to non-service areas.

- Promote adequate disposal habits and public participation in matters related to USE improvement, in particular on cleansing, storage and disposal manners as well as maintenance and use of facilities and equipment.
- To conduct regular training programs for the population of the beneficiary sector in adequate solid waste and wastewater disposal methods through the mini-workshops, town meetings and house visits.

e.3 Implementation of Workshops

Many workshops and community meetings were held in July 1997, targeting groups for the conduct of public education programs.

The workshop was carried out in cooperation with relevant organizations (MGG, MINSA-SILAIS, INAA, MARENA, MED and NGO), community leaders and town residents from pilot project beneficiary areas and residents from other City areas.

Main items dealt with in the workshop were:

- Introduction of problems caused by solid waste and wastewater.
- Teaching appropriate solid waste and wastewater discharge measures.
- Use and maintenance of waste collection bays and sullage collective treatment plant.
- Prevention of diseases brought about by improper waste and wastewater management.
- Participation of women on sanitary education, family planning and disease prevention activities.

Percentage of community leaders who received guidance on sanitary education and proper discharge of waste during the workshop was observed to have increased. This can be mainly attributed to the meetings conducted to explain matters concerning the pilot projects, which heightened public awareness of the importance of maintaining a clean living environment.

f. Sanitary Education Program

Public consciousness on USE and public cooperation are essential and indispensable to the improvement of USE. Furthermore, if one of the project's components requires community participation, linking the project with public education programs might be a major key to ensure the project's success.

In this connection, the public education program to be incorporated in the pilot projects is outlined below. The Counterpart and the Team decided to conduct public sanitary education programs through meetings and workshops for the community leaders and residents. The program's detailed contents, methodologies, etc., are currently under discussion.

f.1 Background

The present public education system in Granada will have to serve as the basis for the education program proposed.

Public health education in Granada is under the jurisdiction of MINSA-SILAIS (Ministry of Health-Local Systems of Integral and Health Attention), who organizes sanitary education workshops in different sectors of the City. The workshops are meant to orient the people about the causes and effects of diseases (cholera, dengue, malaria, etc.) and how to prevent and combat them. The workshops use videos and projectors.

Four (4) manuals on sanitary education have been prepared for the inhabitants since the middle of October 1995, and specifically deal with:

- Control and/or disposal of domestic wastewater
- Construction, use and maintenance of latrines
- Adequate garbage disposal
- Protection of drinking water

Furthermore, sanitary education activities (training of 30 teachers (January 1996)) were coordinated with the cooperation of the MED (Ministry of Education).

Other organizations, such as FISE (Emergency Social Investment Fund) and MAS (Ministry of Social Action), by appropriating funds from the national budget and/or foreign donation, finance community base projects such as the construction of schools, latrines, health centers, access roads, and forming environmental protection activities, etc. Besides this, MAS implements sanitary education programs, trains residents on the adequate use of latrines, and helps low income people improve their skills for better chances in getting jobs.

Meanwhile, international assistance is received through the following:

- IDB finances the conduct of projects that place emphasis on public welfare. It also finances the training of volunteers (*brigadistas*);
- WHO finances activities concerning the improvement of public health, cleanliness sessions, and public training; and
- An international NGO called World Vision (*Vision Mundial*) works in coordination with MINSA and finances community base projects. The sanitary education program conducted by this organization basically focuses on women and their development, and trains mothers with children less than 2 years old.

f.2 Public Education Program to be Proposed

The public education program under discussion shall take the following issues into consideration:

- Stepwise deployment of the program (i.e., short, middle and long term objectives and activities);

- Roles of related institutions (e.g., Municipality, MINSA-SILAIS, other authorities, NGOs, schools, medical institutions, community organization, etc.) in program planning;
- Roles of relevant authorities (e.g., municipal councilors, MINSA-SILAIS, officials, NGO members, school teachers, medical professionals, community leaders, community volunteers, mothers, etc.) in the implementation of the program;
- Connection to “formal education programs”, “community-based education programs”, and “family-based education programs”;
- Contents of respective program materials and its selected application methodologies;
- Appropriate venue selection for program implementation.

The proposed education program is currently being prepared by the Counterpart.

f.3 Educational Booklet

The educational booklet must be designed to fit several purposes. It should complement the education program, introducing preventive rather than corrective sanitary education measures to the community. With this in mind, the booklet is designed as follows:

- Small, brief and simple to avoid initial rejection by the public.
- Colorful and made with quality materials to encourage the people to read it.
- Layout with little text and many pictures and illustrations to avoid boredom.
- Impersonal text, with a vocabulary not restricted to any particular age, gender, income, social, religious or interest group.
- Plot supportive of the video, i.e. present situation (harmful consequences) and adequate measures to avoid such consequences (benefits of taking the measures).

The booklet shall also be identified by the slogan below to create a homogeneous and global campaign by defining a unified message.

“Trabajemos juntos para una Granada más limpia”

(“Working together for a cleaner Granada”)

g. Public Cooperation

As stated before, public cooperation is fundamental to the accomplishment of goals related to USE improvement in Granada. Public cooperation can be achieved through the conduct of public awareness campaign together with other health promotion activities.

These public awareness campaigns shall rely on poster or sticker making competitions, distribution of T-shirts and caps carrying the campaign messages, and pamphlets, etc., to be distributed to institutions, during public meetings, neighborhood associations, residents, students, shops, public workers, etc.

h. Findings

The execution of the experiment at community meetings and workshops on USE improvement opened the eyes of the people to the environmental problems that currently prevail. The majority of community leaders and residents listened to the lectures and made discussions and interesting questions.

This experiment made the people realize how dirty their towns are and how important appropriate solid waste discharge is. The continuation of the sanitary education programs will further motivate the people to keep their towns clean and beautiful.

Many people related to the USE conditions understand that the conduct of sanitary education programs would significantly contribute to the solving of current environmental and health problems, as these programs are instrumental to the proper conduct of waste collection and disposal services. This is why the residents were considerably grateful for the conduct of the program.

The method of community education on USE which was used for the experiment was found to be very effective in Granada and may be applicable for Leon and Chinandega and other cities in Nicaragua aside from the small revisions that should be made in accordance with the town characteristics.

O.2.4 Public Opinion Survey for "Beautify Granada Campaign"

The questionnaire survey shall be used to plan the improvement of urban sanitation environment in the City of Granada. It will be conducted by the Counterpart and JICA Study Team.

The interview survey shall be conducted before and after the implementation of the "Beautify Granada Campaign". Interviewees for both before and after the survey does not necessary have to be the same person and shall be selected according to the following criteria:

1. Total number of samples : 150
2. 80 samples shall be selected in the pilot project areas and its surroundings, for every 100 meters as follows:
 - 10 from houses located around *barrio* El Bolson and Las Camelias;
 - 20 from houses located around *reparto* Adelita I;
 - 20 from houses located around *reparto* Eddy Ruiz III;
 - 30 from houses located around along Arroyo Zacateligue in La Talpujera, La Sirena and El Resbalon.
3. 70 samples shall be selected from other City areas, for every 100 meters as follows:
 - 10 from houses located around *reparto* Bartolome;
 - 9 from houses located around Villa Sultana and Pancasan;
 - 15 from houses located around Campo de Aterrizaje;
 - 16 from houses located around *reparto* El Rosario and El Escudo
 - 10 from houses located around *reparto* Silvio Ruiz;
 - 10 from houses / shops located around the central area of Granada.

Note: The total survey area samples shall be fixed. However, the sample numbers of the town may be changed depending on the availability of interviewees.

a. Questionnaire Survey Format for "Beautify Granada Campaign"

a.1 Questionnaire Survey Format (Before)

Questionnaire Survey (Before)

Survey Location	City of Granada Place :		
Date of Survey	June, 1997		
Sampling Scale	150 people : residents, shop-owners of Granada City		
Survey Method	Individual interview		
Name of Interviewee		Age:	Sex:
Address of Interviewee			
Name of Interviewer			

No.	Questions	yes	no	Remarks
Q1.	Are there sanitary problems in your town ?			
	If the answer to question Q.1 is "NO" do not answer question Q2.			
Q2.	Are these sanitary problems related to :			
	a. Refuse			
	b. Potable water			
	c. Discharge of wastewater			
Q3.	Public Campaign for the Improvement of USE			
	a. Do you think there is enough public awareness regarding the improvement of the sanitary conditions in the City ?			
	b. Do you think public education is necessary for the improvement of sanitary conditions in the City?			
	c. Do you think public cooperation is necessary for the improvement of the sanitary conditions in the City?			
	d. Will you participate and cooperate for the improvement of sanitary conditions in the City?			

a.2 Questionnaire Survey Format (After)

This questionnaire shall be used to plan the improvement of urban sanitation environment in the City of Granada. It will be conducted by the Counterpart and JICA Study Team.

Note: The interviewee for before and after surveys does not necessarily have to be the same person.

Questionnaire Survey (After)

Survey Location	City of Granada Place :		
Date of Survey	July, 1997		
Sampling Scale	150 people : residents, shop-owners of Granada City		
Survey Method	Individual interview		
Name of Interviewee		Age:	Sex:
Address of Interviewee			
Name of Interviewer			

No.	Questions	Yes	No	Remarks
Q1.	Are there sanitary problems in your town ?			
	If the answer to question Q.1 is 'NO' do not answer question Q2.			
Q2.	Are these sanitary problems related to :			
	a. Refuse			
	b. Potable water			
	c. Discharge of wastewater			
Q3.	Public Campaign for the Improvement of USE			
	a. Do you think there is enough public awareness regarding the improvement of the sanitary conditions in the City ?			
	b. Do you think public education is necessary for the improvement of the sanitary conditions in the City ?			
	c. Do you think public cooperation is necessary for the improvement of the sanitary conditions in the City ?			
	d. Will you participate and cooperate for the improvement of the sanitary conditions in the City ?			
	e. Do you know of the public campaign "Working together for a cleaner Granada" ?			
	f. If Yes, do you think the public campaign "Working together for a cleaner Granada" is necessary for the improvement of the sanitary conditions in the City ?			

b. Comments of the Citizens during the Questionnaire Survey

b.1 Questionnaire Survey (Before)

The majority of the interviewees agreed that the main environmental deterioration in their town is caused by the inadequate disposal of solid waste and wastewater, which at the same time exposes their children to many diseases. Furthermore, the lack of awareness and education concerning sanitary problems from the community further aggravates the poor sanitary conditions of the City.

The citizens also complained that the institutions of Granada do not help to reduce these problems. They asked to improve waste collection services and to extend the sewerage system in the many areas where these services do not exist.

60% of the interviewees stated that enforcement of laws and imposition of fines on those whom litter water courses and public areas are needed.

As a preventive measure, some respondents suggested the formation of town committees that could control and supervise littering of streams.

Also, the majority of the interviewees desire paved City roads to reduce flooding and erosion and to improve the aesthetic condition of the City.

b.2 Questionnaire Survey (After)

The majority of the interviewees were of the opinion that improving the wastewater and the solid waste problems, would provide an excellent chance to also improve the condition of the roads, which is continuously damaged by floods and wastewater flows.

Most of the people would like an improvement in the waste collection service, and are willing to pay for better services. However, they are against the high fee that the Municipality set for some areas because of the poor economic situation of the inhabitants.

Most of the interviewees do not consider the water supply as a priority, because INAA services almost all areas of the City. Those who do not have water supplied, buy their water from neighbors or in some cases are provided by a family member who lives near to a water sources.

The majority of the interviewees agreed that a public campaign such as the "Beautify Granada Campaign" and sanitary education programs are very necessary to enhance public awareness and introduce cooperation as a means of keeping a good City environment. Most of the citizens are interested to participate in education programs and are willing to cooperate in maintaining a clean City environment.

c. Public Opinion Survey Results

The questionnaire survey of "Beautify Granada Campaign" conducted among 150 residents in the whole of Granada City was carried out on June 16th and 17th, 1997 (before) and on July 21st and 22nd July, 1997 (after).

Questionnaire survey areas and number of samples of town are shown in Figure O-7. As illustrated in the figure, areas 4, 6, 7 and 8 is within the pilot project areas, and areas 1, 2, 3, 5, 9 and 10 are other City areas.

The total survey area of 80 samples for the pilot project areas and 70 samples for other City areas are fixed. However, sample numbers of the town may be changed depending on the availability of interviewees.

Details of the public opinion survey are shown in the Data Book 1.

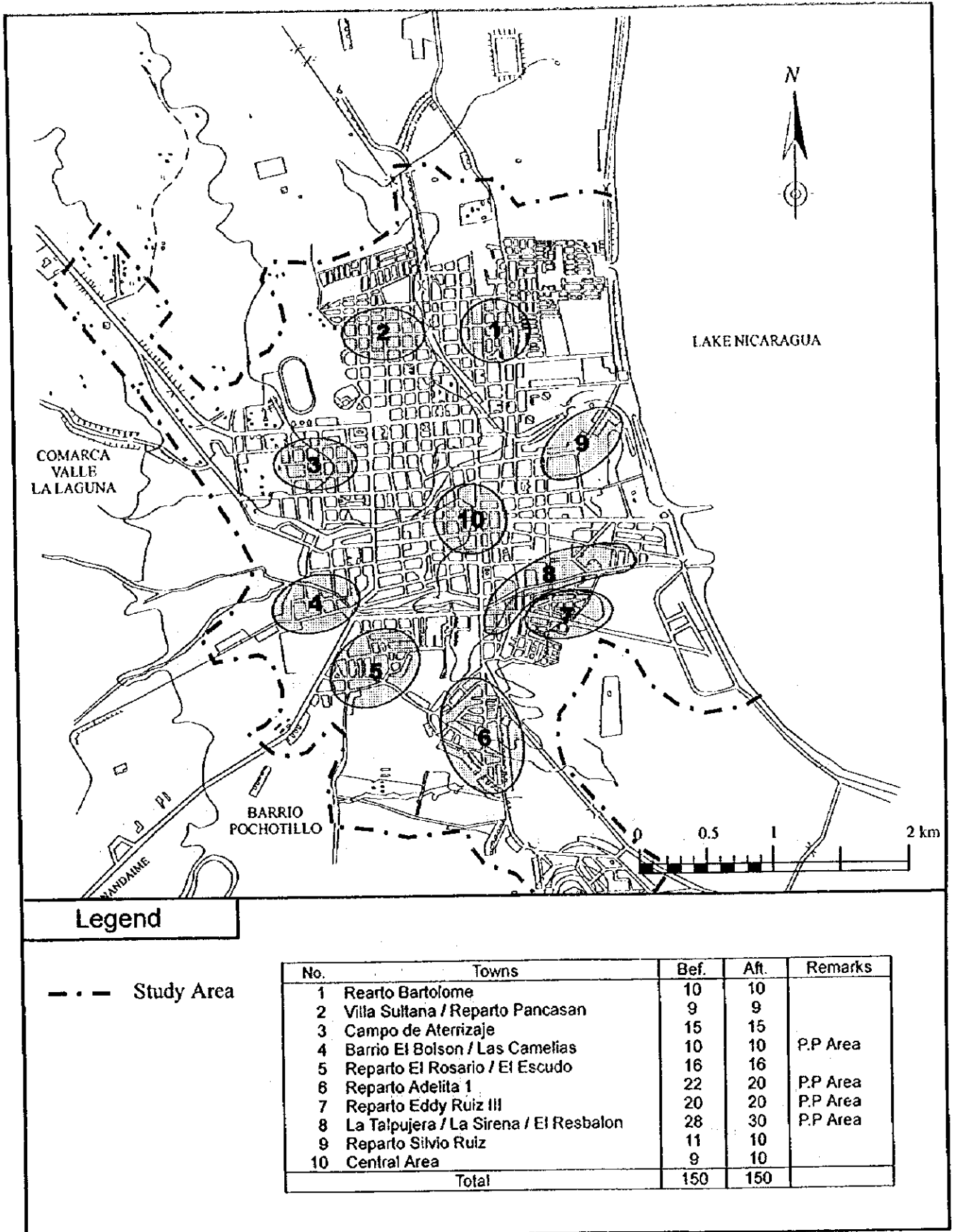


Figure O-7: Questionnaire Survey Areas and Number of Samples

The questionnaire survey results and the number of interviewees in each survey area is given below:

Area	Before (People)	After (People)	Wt. Avg. (%)
Pilot Project Areas and its Surroundings	80	80	53.3
Other City Areas	70	70	46.7
Total	150	150	100.0

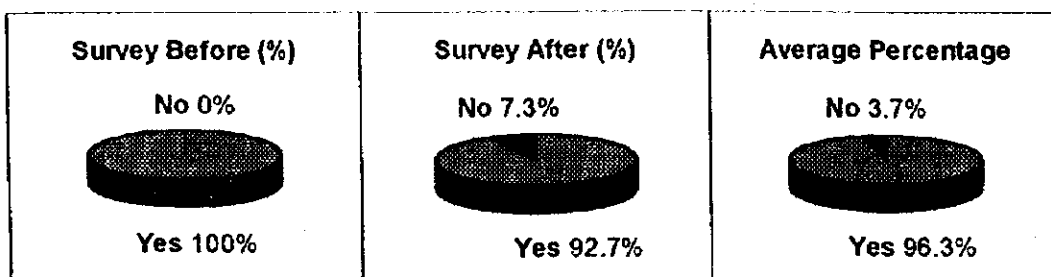
The answers to all questions stated below are expressed in number and terms of percentages of the total number of respondents in each area, as tabulated in the following tables.

Wt. Avg. (weight average) means the average percentage of questionnaire survey both before and after the campaign.

Q.1 Are there sanitary problems in your town ?

Area	Answer	Before		After		Wt. Avg. (%)
		People	(%)	People	(%)	
Pilot Project Areas and its Surroundings	Yes	80	53.3	74	49.3	51.3
	No	0	0.0	6	4.0	2.0
Other City Areas	Yes	70	46.7	65	43.4	45.0
	No	0	0.0	5	3.3	1.7
Total Answers		150	100	150	100	100
P.P. Areas + Other City Areas	Yes	150	100	139	92.7	96.3
	No	0	0.0	11	7.3	3.7

The pie charts shown below summarized the above table for the before and after responses to the Q.1 (Are there sanitary problems in your town ?) as well as the average of both surveys.



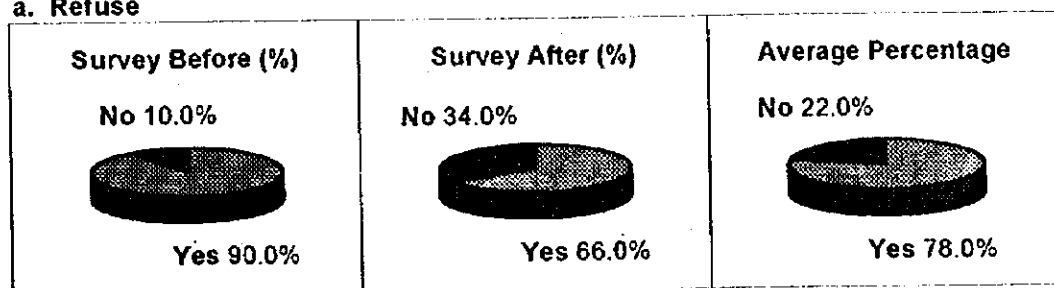
Q.2 Are the sanitary problems related to the following ?

Sanitary Problem	Answer	Before		After		Wt. Avg. (%)
		People	(%)	People	(%)	
a. Refuse	Yes	135	90.0	99	66.0	78.0
	No	15	10.0	51	34.0	22.0
b. Potable Water	Yes	27	18.0	8	5.3	11.7
	No	123	82.0	142	94.7	88.3
c. Discharge of Wastewater	Yes	141	94.0	131	87.3	90.7
	No	9	6.0	19	12.7	9.3

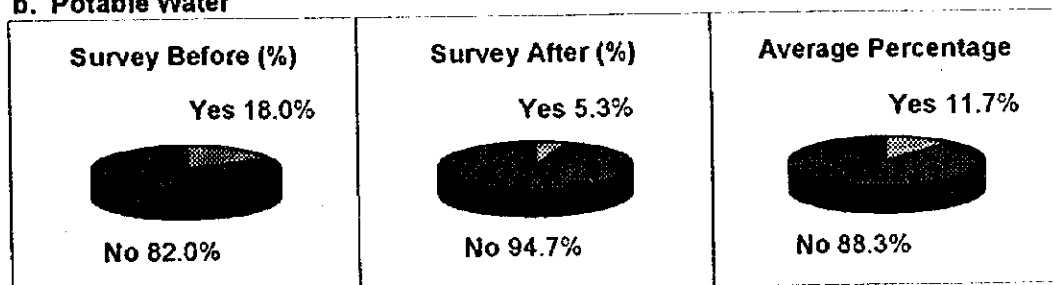
Q.2 shown above was not divided by survey area but by sanitary problem sources. Specific questionnaire survey on refuse collection system and wastewater system experiment by pilot project areas shall be given in a separate public opinion survey format.

The pie charts shown below summarized the above table for the before and after responses to the sanitary problems related to refuse, potable water and wastewater as well as the average of both surveys.

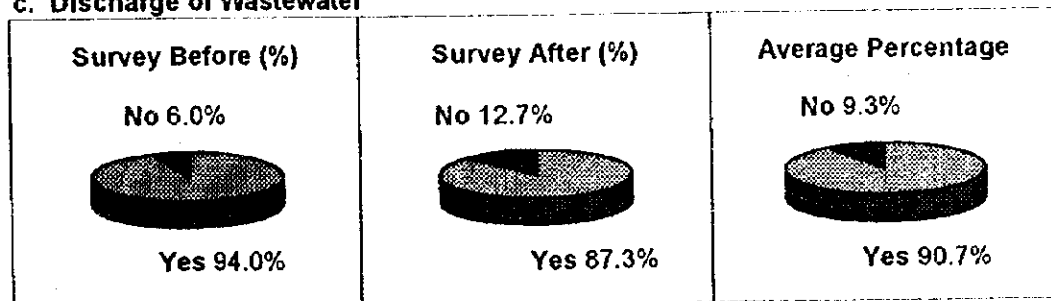
a. Refuse



b. Potable Water



c. Discharge of Wastewater



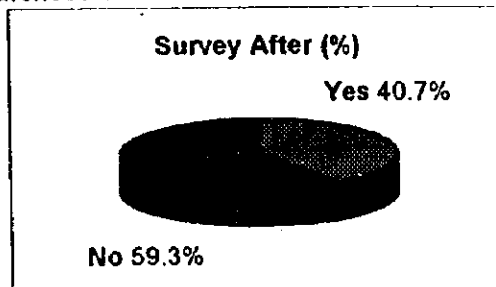
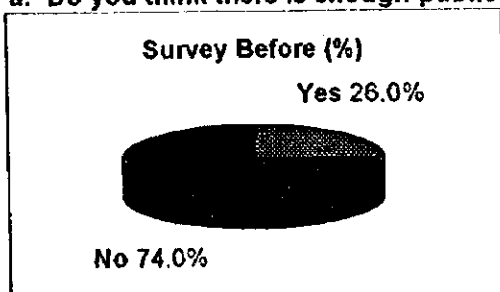
Q.3 Public Campaign for the Improvement of USE (Before and After)

Public Campaign for the Improvement of USE	Answer	Before		After	
		People	(%)	People	(%)
a. Do you think there is enough public awareness ?	Yes	39	26.0	61	40.7
	No	111	74.0	89	59.3
b. Do you think public education is necessary ?	Yes	150	100	150	100
	No	0	0.0	0	0.0
c. Do you think public cooperation is necessary ?	Yes	150	100	148	98.7
	No	0	0.0	2	1.3
d. Will you participate and cooperate ... ?	Yes	142	94.7	143	95.3
	No	8	5.3	7	4.7
e. Do you know the public campaign "Working together..." ? (*)	Yes	-	-	124	82.7
	No	-	-	26	17.3
f. If yes, do you think the public campaign "Working together ..." is necessary ? (*)	Yes	-	-	124	82.7
	No	-	-	1	0.6
	NA	-	-	25	16.7

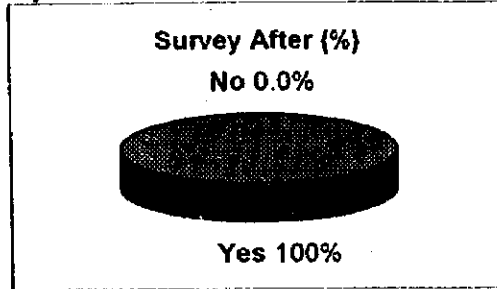
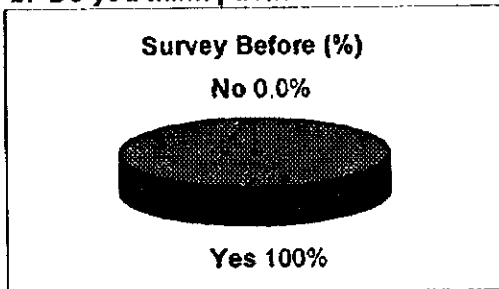
Note: (*) Question (e) and (f) were not included in the questionnaire survey (before)
NA No answer

The results of the above table are summarized by pie charts as shown below :

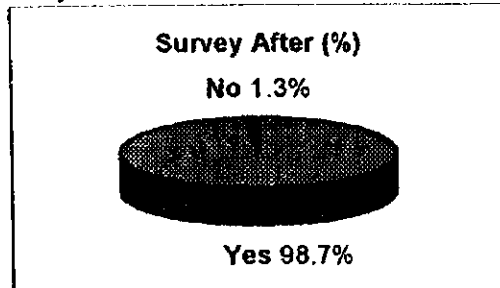
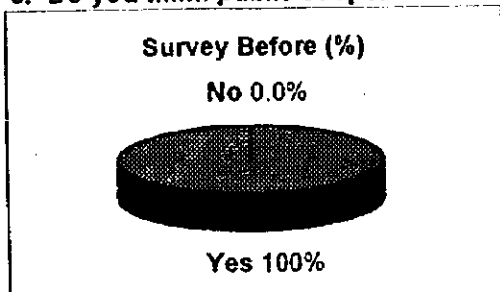
a. Do you think there is enough public awareness ?



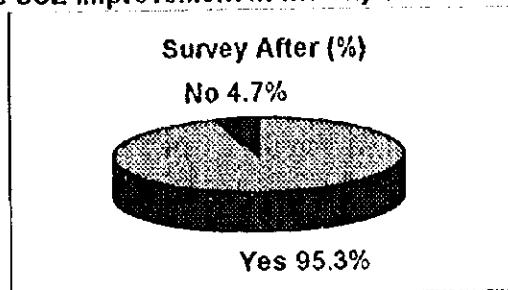
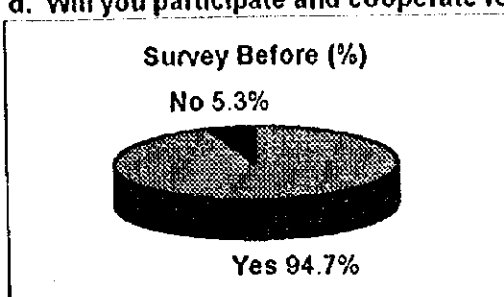
b. Do you think public education is necessary ?



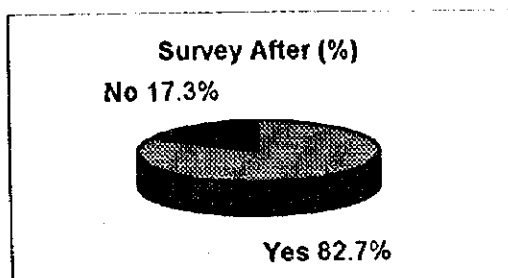
c. Do you think public cooperation is necessary ?



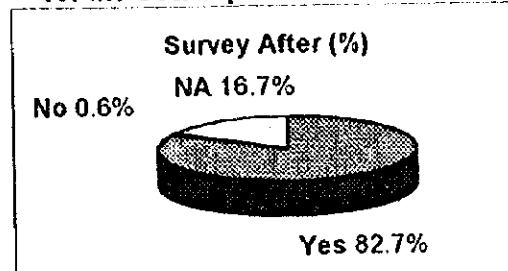
d. Will you participate and cooperate for the USE improvement in the city ?



e. Do you know of the public Campaign "Working together for a cleaner Granada"



f. If yes, do you think the public campaign "Working together for a cleaner Granada" is necessary for the USE improvement ?



NA : No answer

c.1 Analysis of the Questionnaire Survey

c.1.1 Sanitary Problems

As observed in the tables (Q.1 and Q.2), an average of 96.3% of the people interviewed around the pilot project areas and surroundings, and other City areas agreed that there are sanitary problems in their town, and that these problems are related mostly to discharge of wastewater (90.7%) and refuse (78%). Problems related to potable water is only 9.3%, existing in some City peripheral areas.

c.1.2 Necessity of Public Awareness

According the Table (Q.3), residents who stated that there is not enough public awareness, decreased from 74% (before) to 59.3% (after). This implies that the public campaign carried out by the Counterpart and Team, have positively influenced the people's awareness and behavior during the campaign period. Due to campaign activities by means of broadcast canvassing, signboards, slogan placards, distribution of posters and stickers, provision of T-shirts and caps with slogans and through the implementation of meetings and sanitary education workshops given to the town leaders and residents during the campaign period, heightened public awareness of the importance of maintaining a clean living environment.

c.1.3 Necessity of Public Education and Cooperation

As observed in Table (Q.3), from both the before and after questionnaire surveys, the majority of the interviewees answered that public education (100%) and cooperation (98.7%) are necessary to improve the sanitary conditions of the towns. Percentage of residents from the pilot project areas and its surroundings who received guidance on sanitary education increased slightly during the campaign month. However, public

education can not be achieved in a short period, but it encourages the citizens to continue educational workshops and programs.

c.1.4 Willingness to Cooperate and Participate in USE Improvement

94.7% and 95.3% of the interviewees in the questionnaire survey (before) and (after) respectively, stated that they will cooperate and participate in the improvement of USE in the City.

On the other hand, public cooperation and participation were successfully attained during the campaign period, which was demonstrated in the four clean-up operations carried out in the pilot project areas by the institutions, students, volunteers and the community involved.

c.1.5 Knowledge of the Public Campaign "*Working together for a cleaner Granada*"

The accomplishments of the goals related to the campaign objectives were achieved effectively. "*Beautify Granada Campaign*" under the slogan "*Working together for a cleaner Granada*" known by almost 83% of the interviewees promoted public awareness and introduced public cooperation in the whole City. Also, all of them stated that a public campaign is necessary for the improvement of the aesthetics as well as sanitary condition in the City and were very interested and willing to cooperate for the maintenance of a clean living environment.

O.2.5 Conclusion and Recommendations

The questionnaire survey before and after the public campaign was carried out revealed the significance of public awareness and education in making Granada City a pleasant place to live in. The slogan, "*Working together for a cleaner Granada*", also accentuates the importance of the cooperation and participation of relevant organizations, business establishments and the public, in environmental sanitation.

As mentioned in previous sections, efforts have been made to enhance public awareness and transmit relevant knowledge through public education programs during the campaign.

In Nicaragua, an individual's educational status is usually reciprocal to his economic situation. And because a lot of the people are poor, many are illiterate. On the other hand, the cultivation of consciousness does not involve money.

The "*Beautify Granada Campaign*" proved the communities' willingness to participate in the activities to keep the City clean and safe. This willingness implies awareness of the negative environmental and sanitary conditions that currently surround them. Taking this into consideration, the "*Beautify Granada Campaign*" was conducted, bearing in mind the need to cultivate good waste disposal habits among the residents.

Meetings conducted in pilot project communities using sophisticated and technical terminology were not successful in conveying the significance of the project to the people, who are not well educated. On the other hand, explanations conducted in the site were able to hold the people's attention by using simple layman's terms when introducing concrete examples of the adverse effects of sanitary conditions, appealing to

the sense of community and brotherhood in which residents influence each other to change or modify improper habits.

The number of community leaders participating or receiving guidance in sanitary education and proper waste discharge during the campaign was observed to have increased. This may be attributed to the meetings and workshops conducted to explain the pilot projects. The incorporation of public meetings in the pilot project program would significantly help ensure the campaign's success, as the positive impacts of a clean environment and the negative impacts of a unsanitary one may be introduced to the people. Consequently, the main techniques selected for experimental USE improvement were community meetings and educational workshops. Both techniques were considered to have been successful in enhancing resident awareness.

To carry environmental sanitation concerns into the future, relevant programs should be introduced into the educational system. The inclusion of subjects such as sanitary education and hygiene in the school curriculum shall teach students on the importance of environmental sanitation. The enthusiasm shown by students who participated in clean-up operations also prove the need to incorporate these subjects in the school program.

Previous conclusions attest to the fact that public awareness has indeed increased after the campaign. The concrete steps for USE improvement taken by the Counterpart with the help of the Study Team during the campaign have aroused public interest. Now, it is up to the public and institutions to take action to prove the depth of their interest and continue the programs introduced.

The tables below show the kind of actions relevant organizations and the community should undertake to continuously promote environmental sanitation.

Actions to be undertaken by relevant organizations	<ul style="list-style-type: none">● Improve waste collection services and wastewater systems● Promote policy coordination among relevant organizations● Enforcement of relevant USE regulations● Continue campaigns for a clean living environment● Conduct regular education programs for the community through town meetings and workshops.● Continue clean-up operations in the entire City
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Actions to be undertaken by the community	<ul style="list-style-type: none">● Participate and cooperate in keeping the environment clean● Participate in education workshops● To adopt environment-friendly habits● To influence neighbors and friends with regard to changing or modifying improper habits
--	--

The continuous conduct of these actions should be promoted to maintain a clean and sanitary environment. Environmental issues should be communicated to the public and relevant authorities through the mass media, by encouraging local newspaper to cover environmental news.



Plate O-6 : Beautify Granada Campaign (Placard)



Plate O-7 : Beautify Granada Campaign (Distribution of Stickers)



Plate O-8 : Volunteer Students Participated in the Campaign



Plate O-9 : Workshop (Eddy Ruiz III)



Plate O-10 : Workshop (La Talupujera)

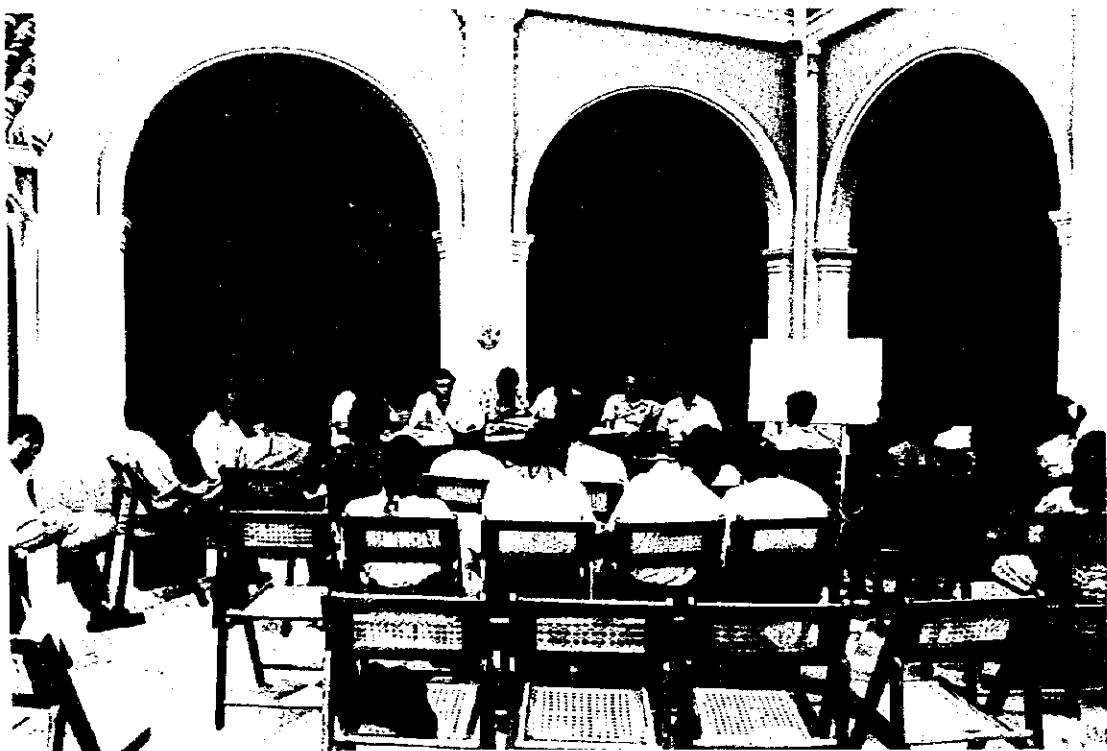


Plate O-11 : Seminar in Casa de Los Leones



Plate O-12 : River Cleansing Work (El Bolson)



Plate O-13 : Community Participant in the Campaign T-shirt (El Bolson)

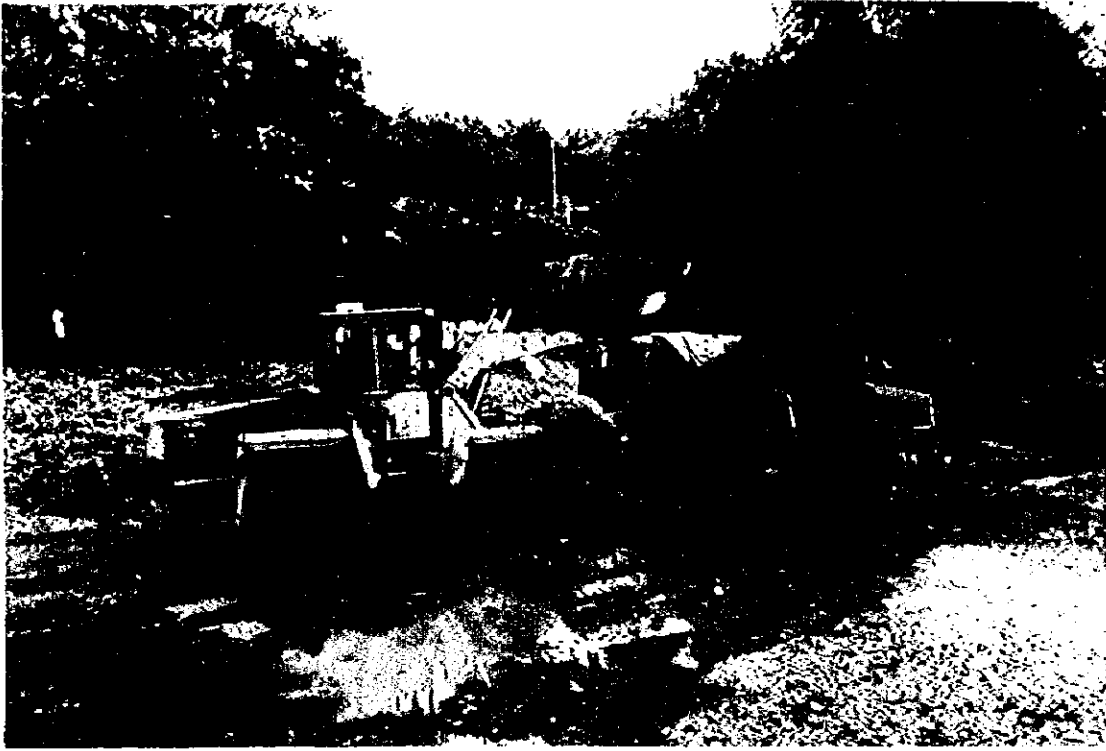


Plate O-14 : River Cleansing (La Talpujera)

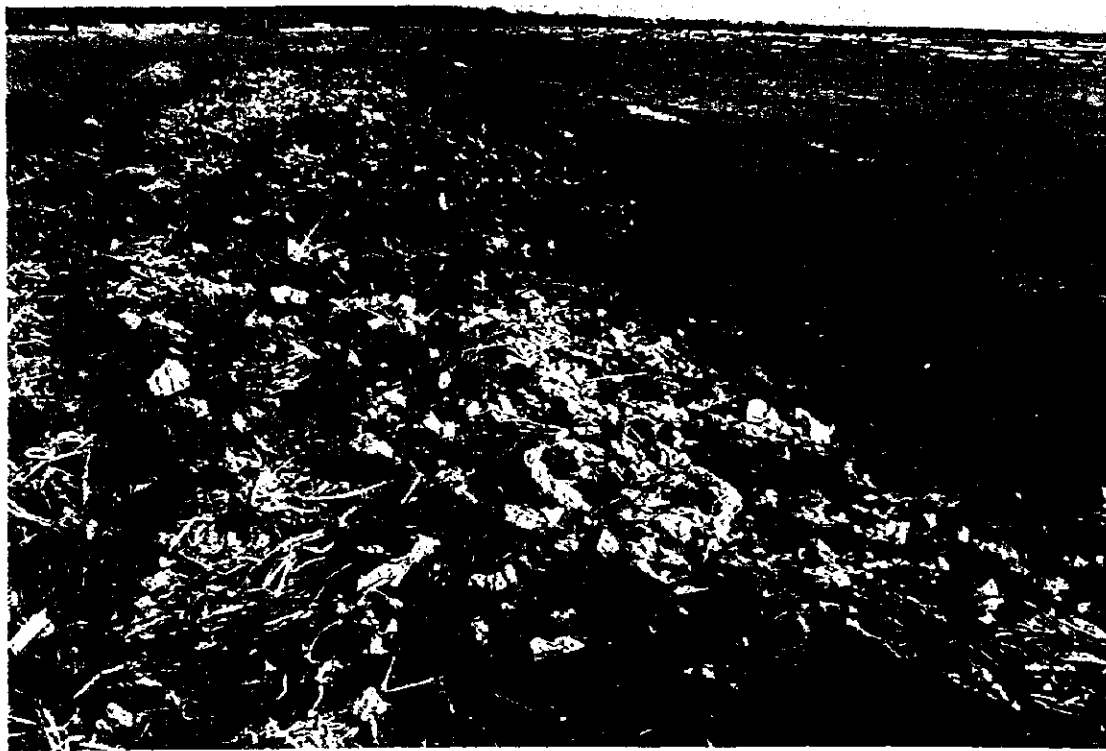


Plate O-15 : Nicaragua Lake (Before Clean-up Campaign)



Plate O-16 : Communal Lake Cleansing Volunteers



Plate O-17 : Beach Cleansing Work 1



Plate O-18 : Beach Cleansing Work 2



Plate O-19 : Clean-up Completed



Plate O-20 : Grand Seminar in World Vision



O.2.6 Model Community Integrated USE Improvement Project

a. Background

a.1 Background

The 1998's ended with Nicaragua facing critically impoverished conditions. The civil war significantly influenced national and regional economic growth as it impelled the rapid and accentuated decline in social indicators that led to the decay of productive and social infrastructure. Today, the standard of living in many southern urban areas is still one of the worst in Granada, a condition that is mainly attributed to unemployment or underemployment.

The desire to improve living conditions, the need to satisfy the minimum health requirements, education, etc., the war that lasted a decade, and the need to save people's lives compelled the rural inhabitants to emigrate to the cities. On the other hand, the deterioration of the economy and population increase have consequently raised the demand for resources, housing, health, and education.

Most of the *barrios* in suburban areas established before the 1980's are on lands that used to be private properties. After a few years, some received better services while some did not.

New settlements in the southern fringe (see Figure O-8) probably originated in the 1980's and have different development characteristics. Most of these areas were expropriated due to political reasons. Some were confiscated from former owners and, subsequently, the lands were given to low income people in need of housing. In other cases, the political pressure of the decade impelled some owners to donate or sell their property at market prices. Therefore, these areas are not well provided with the basic infrastructure such as roads, drains, sewerage systems, water supply, electricity.

These new settlements (called Progressive Settlements) in the southern part are: La Sabaneta (Eddy Ruiz), San Ignacio, Adelita II, etc. These new settlements together with the rest of *barrios* formed several years ago constitute the present southern urban area which comprise the Model Community Integrated USE Improvement Project Area.

a.2 Land Ownership

Barrios located in Zone C1 (Eddy Ruiz) are on lands donated by a private owner, while *barrios* and *repartos* in Zone C7 were donated by the Municipality. The rest of the land areas (C2, C3) were private properties sold by former owners. However, the conditions in *barrio* El Bolson (C3) are unclear, because the legal owner still claims ownership.

a.3 Income Level

There are no detailed socioeconomic studies of the model community areas. People living in the urban core and the downtown area are presumed to have better incomes than those in the suburbs or City outskirts. According to a public survey conducted in June 1997, however, the average expenditure per family in these model community areas is about 700 Cordobas a month. Therefore, it is estimated that the average family income varies from 700 to 1,000 Cordobas per month.

a.4 First Priority Project

As previously mentioned, political pressure compelled the donation or selling of most of the lands to low income people. And because these areas are without the necessary basic infrastructure (water supply, drainage and sewage systems, electricity, waste collection system, favorable access roads, bridges, etc.), they are in very poor sanitary conditions, which is a far cry from a healthy and clean City. These detrimental conditions contributed to the decrease in the quality of life and longevity in these areas.

Water born diseases and respiratory diseases are also prevalent in these sectors, due to the increase in wastewater ponds, accumulation of garbage, unpaved streets and lack of consciousness of the residents concerning sanitary issues.

Given these conditions, the urban sanitary environmental improvement project shall be first conducted in these areas. Below are the main reasons why these areas are given first priority in relation to the conduct of this project:

- Unsanitary conditions due to the discharge of gray water at open areas and streets
- Inadequate management of solid waste and wastewater
- Lack of economic resources to undertake development or improvement programs
- Weak governing institutions
- Dysfunctional judiciary system
- High illiteracy rate
- Lack of environmental consciousness
- Little participation from the residents for area development

Once these basic needs are accomplished, the provision of suitable dwellings, schools, open and green areas, and finally, the legalization of property ownership shall be given priority.

a.5 Latrine Provision

As previously stated, basic services in the south suburban areas of Granada are very insufficient, many houses even lack latrines. In this regard, an NGO organization called World Vision is implementing sanitary education for young mothers with children less than 2 years old, and also latrine construction programs to counter-act the unsanitary conditions in poor areas. In order to improve sanitary conditions, the Team contacted WV for cooperation in the implementation of the WV latrine construction program together with pilot projects.

Therefore, a survey was carried out in El Bolson, where no basic services exist, including latrines (about 10 families; 8 to 10 persons per household). The people in the City periphery along Arroyo Zacateligue live in very unhealthy conditions. Considering these conditions and their significant impact on the surrounding areas, WV, in coordination with MINSA-SILAIS and the Team, planned to provide some latrines with the community people's support. However, due to land ownership problems, the plan was suspended until the situation is mutually resolved by the Municipal Government, the lawyer and the land owner.

Also, a joint survey (WV, Team, MINSA-SILAIS, MGG) was conducted in Eddy Ruiz III and other suburban areas without latrines. Accordingly, WV proposed the provision of latrines for individual houses without this basic service. Materials for latrine construction will be provided by WV, technical assistance by MINSA-SILAIS in cooperation with the Team, and labor by the community itself.

b. Requirements of a Proper Urban Development Scheme

b.1 Background

There are no urban development plans, land use and updated zoning regulations in Granada, due to the restricted finances of the Municipality, which is sustained only through the small taxes paid by its residents. The little that the Municipality has is directed to other prioritized activities, hence the indefinite postponement of urban development plans for the City.

The absence of development plans have brought about the following problems:

- Population increase and absence of strategies to mitigate adverse impacts thereof;
- Rapid increase in poverty levels;
- Need to improve legislative system (adjusting the system in accordance with the needs of the country, with the incorporation of development plans), and the capability to comply with legislation established by related institutions.

b.2 Requirement for Proper Urban Development

A proper urban development scheme is essential to plan, regulate and secure areas for public use such as roads, drains, parks, open areas for communal use, emergency areas (shelter), collective DWWT facilities, etc. A City cannot further its own growth without these public services and the facilities essential to the improvement of sanitary conditions.

Therefore, future developments or urban expansion schemes should be planned considering the above required spaces to prevent overcrowding and urban congestion, and avoid unnecessary expenditures incurred by improper developments, which also reduce the efficiency of supervising institutions.

b.3 Recommendations for a Proper Urban Development Scheme

The following are some of the pertinent measures for a proper urban development scheme:

- Definition of the economic resources for City development.
- Raising of public awareness and cooperation in order to maintain a clean urban environment.
- Enforcement and institutionalization of urban development and management measures.
- Enforcement of laws and establishment of functional judicial institutions.
- Encourage community participation in development activities.

- Acquisition of knowledge and information necessary to policy making to alleviate urban social and environmental problems.
- Providing the management with know-how and expertise, and coordinating City development programs.

These measures are the first steps toward the proper development of the urban environment. Success will fully depend on government and public cooperation, as the implementation of these measures shall require a lot from them.

The main agencies responsible for urban development shall strictly consider these actions and measures to properly instigate urbanization and the creation of a healthy urban environment.

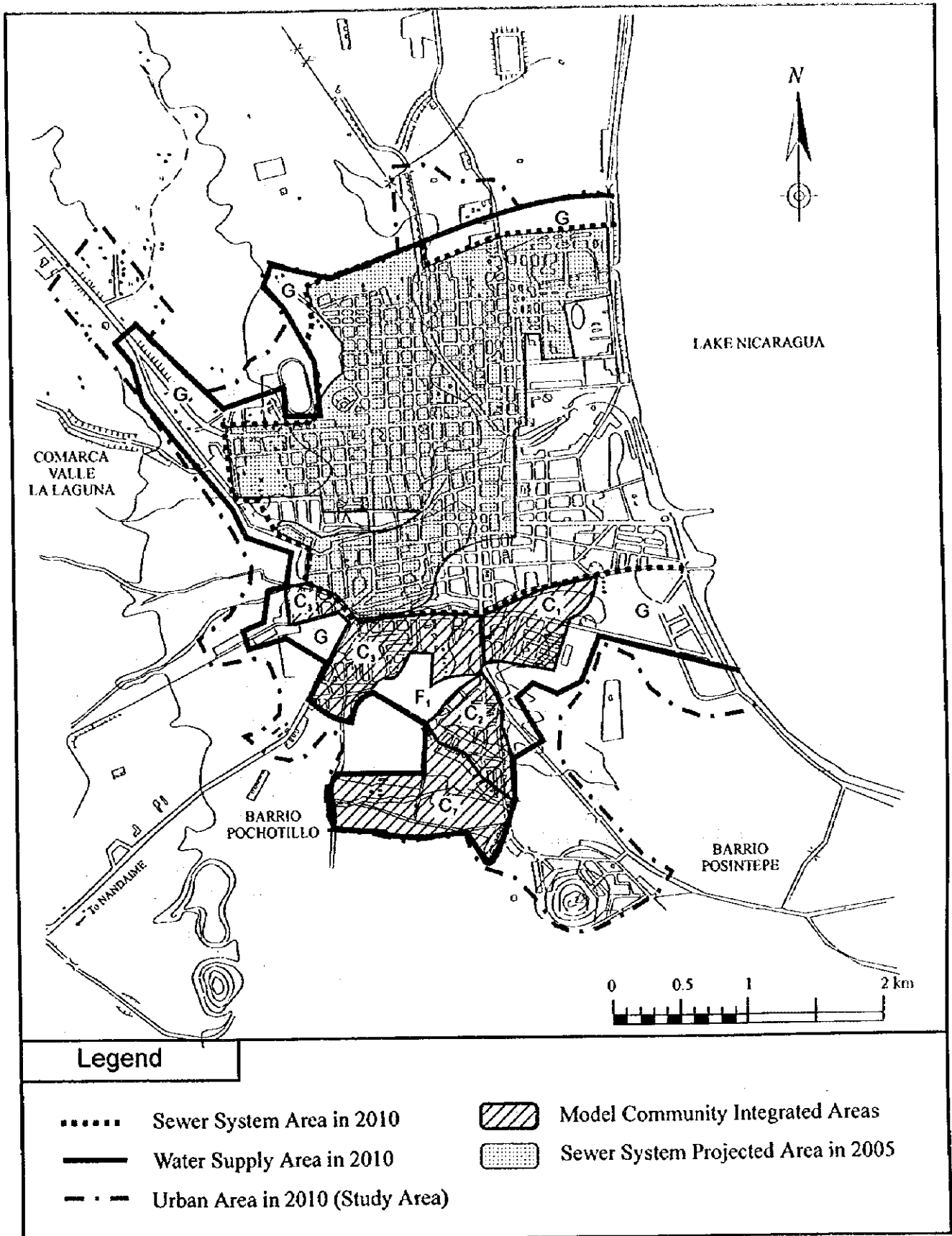


Figure O-8: Model Community Integrated USE Improvement Areas

O.3 Experiment on Improvement of Refuse Collection System

O.3.1 Background

Refuse collection service is insufficient in the urban fringe/semi-urban area of the Granada City. The service is offered irregularly and/or, in some cases, no service is provided.

Since no adequate supply is provided in machines and equipment to operate the refuse collection, and in addition, the poor road condition leads the service more difficult to operate. Collection vehicles are disabled to reach the collection points for narrow alleys, and worse, they are easily stuck on the muddy roads especially in the rainy season.

This has been raised as a critical sanitation environmental problem in the area. Illegal dumping has been observed in many places especially on to the vacant land and into rivers/streams.

Therefore, the Study Team suggested in the Master Plan(M/P) that the existing Curb Collection System should be replaced by Point Collection System within the area to relief the situation, and also this would expected to improve the service with lower cost in comparison with the former system.

To verify this idea, the Study Team requested the municipal government to select a sample area where to execute an experiment for examining the new service feasibility, and three areas, namely Eddy Ruiz III, San Ignacio and Villa Sulutana were nominated for the experiment.

The Study Team made a reconnaissance of these candidate areas in the environmental engineering point of view and a questionnaire survey in February 1997 to check whether the areas were appropriate for the experiment. On the basis of the result of the surveys, the Team had a meeting with counterparts from the Municipality. Then, Eddy Ruiz III was selected for the experiment. The reasons were as follows:

- San Ignacio, newly established with low population density, urgently needs water supply service in advance with other services essentially. Therefore, it was judged that the village had not been matured to be provided the refuse collection service.
- Although the results of the questionnaire survey in Eddy Ruiz III and San Ignacio were similar (See Data Book 6), Eddy Ruiz is located in the area where is to be a subject of the Priority Projects, i.e., Model Communities Integrated USE Improvement Plan. Then, data acquired in the area can be reference for the Priority Project directly.

O.3.2 Plan of the Experiment

The principal purposes of the experiment are as follows:

1. Whether the residents accept a new collection service (Point Collection System) or not? Although the system can reduce cost, it needs definitely residents' contribution to function effectively.
2. How much budgetary burden for the regular service in the future can the residents defray in low income area (the average expenditure is C\$697/month/house.)?

The followings were basic ideas of the experiment.

- i. settlement of refuse collection points for Point Collection System,
- ii. examination on fitness of refuse collection bays and refuse deposit containers for the Point Collection System,
- iii. acquisition of the residents' confidence by providing a periodical refuse collection service,
- iv. acquisition of the residents' cooperation to discharge waste properly and to maintain the refuse collection points,
- v. implementation of public education and explanation of the experiment by the Municipality and/or the authorities concerned.
- vi. data collection (waste amount collected, collection time, etc.)

Table O-11 shows the roles of the relevant organizations for the experiment.

Table O-11: Roles of Relevant Organizations

Organizations	Roles
Granada Municipality	<ul style="list-style-type: none"> - Explanation of the experiment to residents concerned with, - Implementation of a public education and cooperation campaign, - Improvement of access roads to the waste collection points, and - Execution of the periodical waste collection service.
MINSA	<ul style="list-style-type: none"> - Explanation of the experiment to residents concerned with, and - Implementation of a public education and cooperation campaign.
JICA Study Team	<ul style="list-style-type: none"> - Preparation of the experiment (construct waste collection bays, provide waste deposit containers, and provide a waste collection vehicle) - Supervision and evaluation of the experiment, and - Support the Municipality for a public education and cooperation campaign.
Community	<ul style="list-style-type: none"> - Never dump their waste into the river and other public places, - Discharge waste with being kept in a receptacle to the waste collection bays or containers appropriately, and - Maintain the waste collection points clean.

O.3.3 Execution of the Experiment

The schedule of the experiment is shown in Table O-12 briefly.

Table O-12: Schedule of the "Experiment on Improvement of Refuse Collection System"

No.	Items	Date	Remarks
1	Confirmation of the collection points settled by the Granada Municipality	05/06	by Granada and Study Team
2	Planning of a collection route	10/06	by Granada
3	Execution of questionnaire survey (before)	16-19 /06	by Study Team

No.	Items	Date	Remarks
4	Execution of Guidance 1) Eddy Ruiz III 2) Talpujera 3) Bolson 4) Resbalon 5) Sirena	24/06 28/06 27/06 01/07 02/07	by Granada, MINSA, MARENA, INAA and Study Team
5	Construction of refuse collection bays and provision of containers	30/06 -15/07	Study Team
9	Execution of experiments Tuesday, Thursday and Saturday, three times a week collection.	17/07 -09/08	Granada, Study Team
10	Data collection waste collection time (each time from bay to bay, at bay, from La Joya to bay, at La Joya, etc.), waste amount per day, waste amount per point, etc.	17/07 -09/08	Granada, Study Team
11	Execution of questionnaire survey (after)	11-12/08	Study Team
12	Continuing of the experiment	11/08-	Granada

In advance of execution of the project, the final confirmation of refuse collection points' locations and a collection route was set up by the Granada Municipality, and the Study Team confirmed them.

Secondly, the questionnaire survey was conducted by the Study Team to obtain the data such as about the refuse collection point and willingness to pay for the refuse collection service. The result of the survey is to be compared with the another questionnaire survey done after provision of the new Point Collection service.

The guidance (See Data Book 6) which described what the Point Collection System was, how to discharge waste to the collection point was the most important thing to introduce the new system to the residents. The counterpart team which consisted of members from the Granada Municipality, MINSA, MARENA, INAA, and sometimes police, had meeting with community leaders first, at the meeting the counterpart team explained the purpose of the project, how the project affected on their living, and the new refuse collection system. Next, the leaders gave the information to their residents. Furthermore, the Municipality sent to a speaker car to the area to inform the residents of the new service.

This experiment has begun on July 17. For the first week, it did not go well, because the residents were not used to the new system and the information was not conveyed to them enough. However, the new system functioned effectively from the second week due to effort to expand the information by the Municipality, the relevant organizations and the community leaders.

The guidance's outline of the Point Collection System

- Waste has to be discharged to the refuse collection point until 8:00 in the morning on Tuesday, Thursday and Saturday.
- Discharging the waste on the previous day is prohibited.

- Waste should be put in the refuse collection bay or container with being kept in a sac, a plastic bag or another receptacle.

Below are the pictures that indicate the progress of the program.

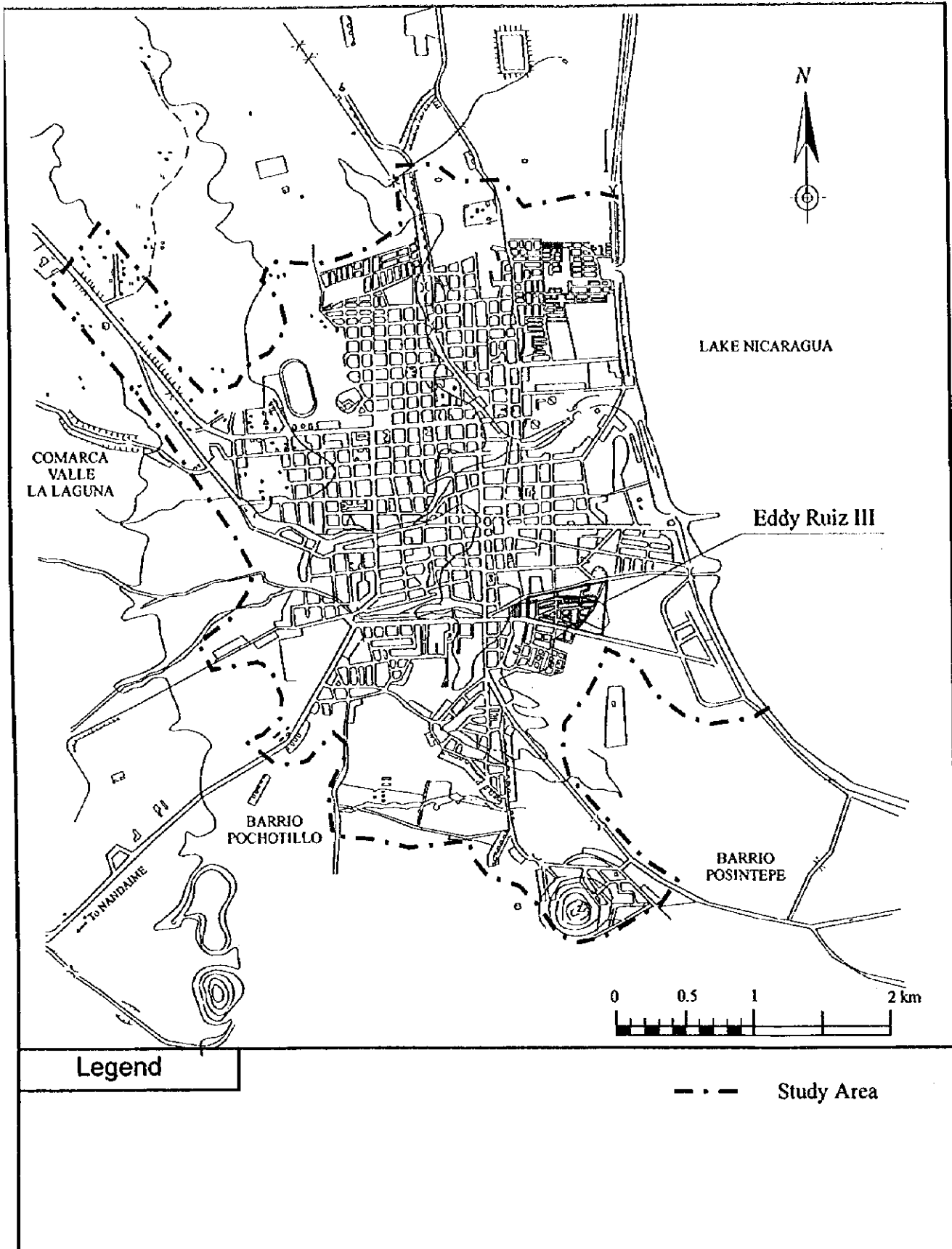


Figure O-9: Location of Experiment on Improvement of Refuse Collection System

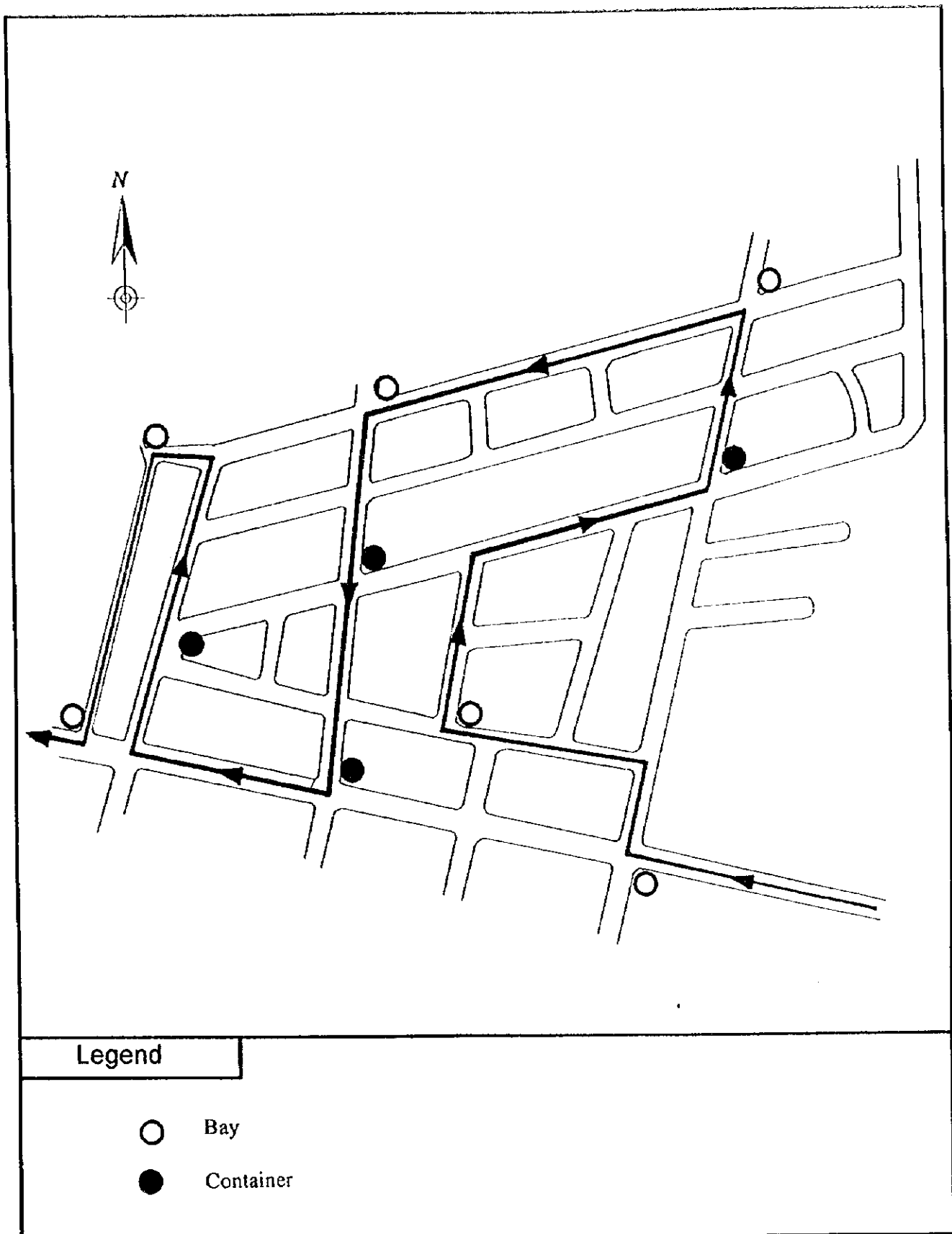


Figure O-10: Refuse Collection Route in Eddy Ruiz III



Plate O-21 : Confirmation of the Collection Points (Eddy Ruiz III)



Plate O-22 : Workshop (Eddy Ruiz III)



Plate O-23 : Seminar in Casa de Los Leones



Plate O-24 : Construction of Refuse Collection Bay

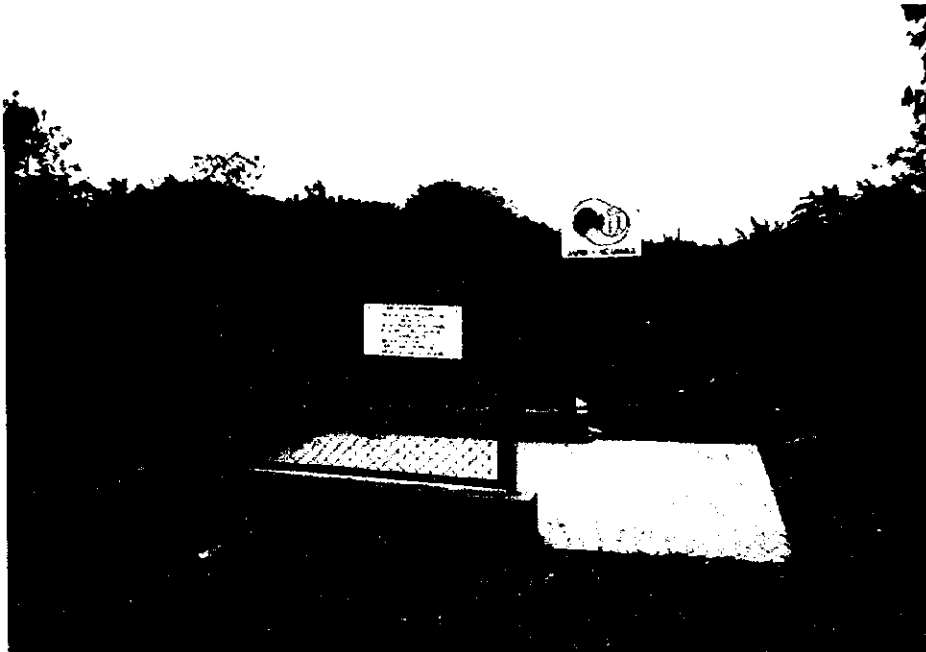


Plate O-25 : Collection Bay with Noticing Board (Completed)



Plate O-26 : Noticing Board on the Bay



Plate O-27 : Provision of Containers



Plate O-28 : Waste Collection for Data Gathering 1



Plate O-29 : Waste Collection for Data Gathering 2



Plate O-30 : Daily Car Wash (by the Collection Staffs Highly Motivated)

The questionnaire surveys conducted on 18 residents after the experiment showed that majority (89%) of the residents were satisfied with the point collection system. Furthermore, all residents replied that waste collection bays are effective for the conservation of USE of the communities.

The amount residents are willingness to pay (WTP) for waste collection services remained the same as before the experiment with the average of 3.3 Cordoba/month. Although the residents replied that they are willingness to pay dropped from 89% to 83%, no significant change could be observed. This is an extremely important fact and the conclusion reached from these facts are as follows;

- 1. Although residents have willingness to pay for the waste collection services, the amount they can pay is very limited.*
- 2. Therefore, it is dispensable to take some measures to reduce cost sharing of residents for waste collection fee by cutting the cost of the collection service in the model district.*

O.3.4 Findings

According to the questionnaire survey carried out in February 1997 on 20 residents (See Data Book 6), more than half (55%) in Eddy Ruiz III were not receiving an adequate waste collection service. This led to the illegal dumping to the rivers by 30% of the residents.

However, Granada City started to provide regular waste collection service from May 1997. As a result of conducting another questionnaire survey on 18 residents prior to the experiment, 94% of the residents were receiving waste collection service (See Data Book 6).

With regard to the question on waste collection points, all residents answered they are willing to carry waste to designated collection points within 25m, while the majority (89%) said they would carry waste to collection points within a distance of 50m. The survey also showed that only 5% (1 people) are currently paying the waste collection fee, which only amounts to less than C\$2/month. The amount the residents are willing to pay for waste collection services averaged C\$3.4/month.

The "point collection system", which strictly stipulates the rules (place, time and method) on waste discharge, is basically accepted and observed by the residents. However, the extent to observe the rule regarding "keep cleanliness of waste collection point" varies widely community by community. This is mainly due to the differences of how and to what extent local community leaders carefully give the instruction regarding the waste discharge rules to each household which uses the waste collection point. Therefore, in expanding waste collection service by "point collection system" in future, residents' co-operation, public education and public education should be indispensable.

Regarding the type of waste collection point, a "waste collection bay" keeps the waste collection points cleaner than the "waste containers". This is because the residents consider that they do not need to observe the rule of time-punctuality in waste discharge in the case of "waste container" system. Furthermore, there was less animal scavenging as the waste discharge time was observed on the whole. Therefore, a "waste collection bay" and a standing notice board will be sufficient for the "waste collection point" system to be proposed.

Considering the observation results of waste generation amount per week for respective waste collection point and cost sharing ability of both Granada City and residents in the communities subject to the experiment, it is recommended that cost of waste collection services in such areas should be reduced by decreasing the number of collection times from three times a week to twice (See Data Book 6).

A bell collection system will be effective in letting residents know that the collection vehicles have arrived, in conjunction with a "point collection system" in order to let residents strictly follow and remind them of the waste discharge time.

The questionnaire surveys conducted on 18 residents after the experiment showed that:

1. Following the new rules introduced for Collection Point Service, most of the community members use the Collection Bays and Containers (See Figure O-11).

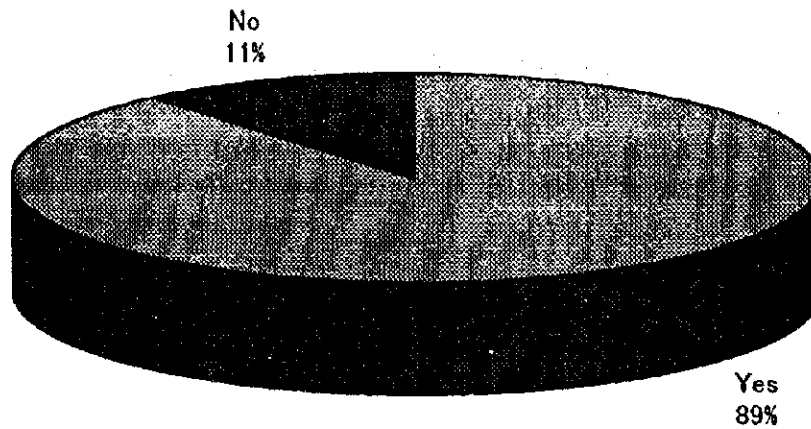


Figure O-11: Use of the Collection Bays and Containers

2. Majority (89%) of the residents were satisfied with the point collection system (See Figure 2-8).

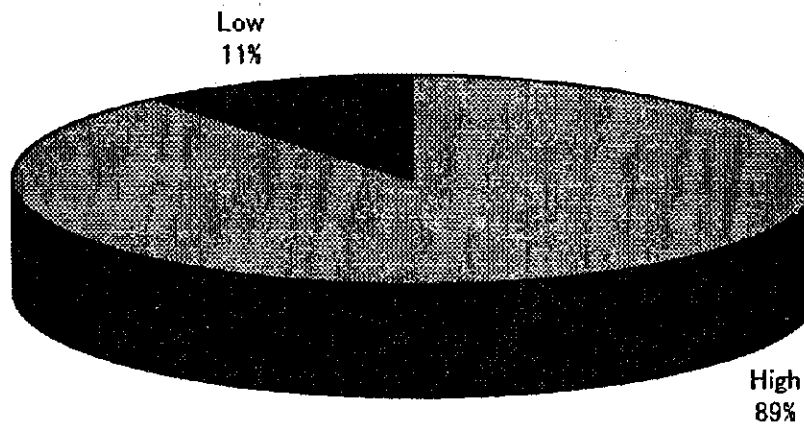


Figure O-12: Contentment on Point Collection Service

3. Furthermore, all residents replied that waste collection bays are effective for the conservation of USE of the communities (See Figure O-13).

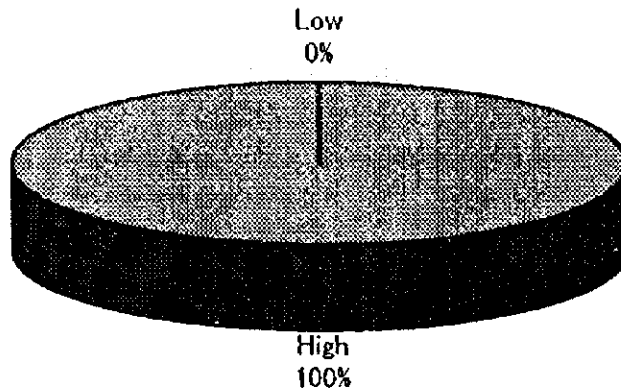


Figure O-13: Utility of the Collection Bays and Containers on USE

4. The amount residents are willingness to pay (WTP) for waste collection services remained the same as before the experiment with the average of 3.3 Cordoba/month. Although the residents replied that they are willing to pay dropped from 89% to 83%, no significant change could be observed. This is an extremely important fact and the conclusion reached from these facts are as follows;
 - ◆ Although residents have willingness to pay for the waste collection services, the amount they can pay is very limited.
 - ◆ Therefore, it is dispensable to take some measures to reduce cost sharing of residents for waste collection fee by cutting the cost of the collection service in the model district.

Namely, WTP categorized in five strata indicated that WTP below C\$2 and below C\$4 is 40%, and rest of them are 7% each (See Figure O-14).

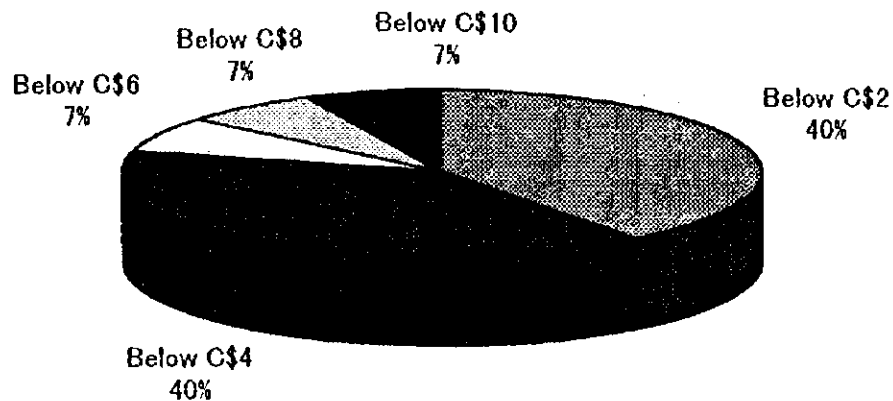


Figure O-14: Willingness to Pay