14.2.8 Public Education Campaign

a. 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.

Techniques to reach limited target groups are endless, therefore, they were divided between area groups, i.e. community centers, neighborhood association, sports clubs, etc., and social groups, i.e., schools, women associations, church organizations, etc., determined by factors such as age, gender and religion.

In targeting area groups, the goal is to focus on issues that directly affect the residents, thus appealing to the sense of community and brotherhood, creating a sense of awareness that would help the residents influence and control changes in improper community habits. The problem with this method is finding a proper way to transmit the idea, due to different educational background and interests. The obvious advantage in dealing with social groups, on the other hand, is that the target is a narrow and specific audience.

For the public education campaign, many techniques has been utilized as much as possible to evaluate their effectiveness. But keeping in mind that the campaign is a pilot project, the selection of the education methods were based on their effectiveness in reaching determined target groups and areas rather than in changing general customs and behaviors, to facilitate proper evaluation.

For the improvement of marginal areas, therefore, the education experiment concentrated on holding meetings with the communities and lectures at educational workshops.

b. Educational Workshop

The general objectives of the educational workshops are to instruct and promote basic information on sanitary problems caused by waste to the population and to develop attitudes and practices that would contribute to proper SWM.

The specific objectives of the above workshops are set as follows:

- To explain the magnitude and urgency of the SWM improvement in marginal areas, by providing the basic means to adequately manage solid waste.
- Stress the benefits of an adequate SWM improvement and the harm that improper SWM may incur on public health, welfare and the environment in relation 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 SW 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 financial problems faced by the Municipality in expanding waste collection services.
- Promote adequate waste disposal habits and public participation in matters related to SWM improvement, particularly in activities that help keep communities clean and underscore the proper maintenance and use of containers.
- To conduct regular training programs for the beneficiary population in adequate solid waste disposal methods through the workshops and community meetings.

Keeping in mind the above specific objectives, community meetings and workshops were carried by the counterpart and the team.

c. Implementation of Workshops

Several workshops and community meetings were held in June and July 1998, every Saturday, targeting community leaders, volunteers and community groups of the pilot project areas for the conduct of public education programs.

The workshop was carried out in cooperation with relevant organizations, i.e., Social Development Manager's Office and Department of Environment (AMDC) and Health Center of Tres de Mayo (Ministry of Health).

The workshop mainly covered the following items:

- Introduction of problems caused by solid waste.
- Teaching appropriate solid waste disposal measures.
- Use and maintenance of waste container.
- Prevention of diseases brought about by improper waste management.
- Participation of women in sanitary education, family planning and disease prevention activities.

The increase in the percentage of community leaders who received guidance in sanitary education and the proper discharge of waste during the workshop is mainly attributed to meetings held to explain the pilot projects. These meetings heightened public awareness of the importance of maintaining a clean living environment.

d. Education Program on solid Waste Issues

The counterpart prepared an educational booklet and a video, with the support of the study team, as one of the means to gain the objectives of the "Study on Solid Waste Management of the Urban Area of Tegucigalpa's Central District". Also, the study team prepared 10 (ten) exhibition panels on solid waste issues for use in lectures during workshops and school conferences, as well as for the "mobile municipality" program.

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

Bearing this in mind, the public education program to be incorporated in the pilot projects was prepared as outlined below. The counterpart and the team decided to conduct public sanitary education programs for the community leaders, residents and students in public schools through meetings and workshops.

The first public education conference in Rafael Pineda Ponce School located in Tres de Mayo was held on July 31st and was attended by 100 of the best students from three schools located in the pilot project areas.

The public education conference was held, showing the present situation on solid waste issues through the presentation of a video, discussion of the educational booklet, explanation on solid waste problems and possible solutions, citizen participation and cooperation.

Public education conference held in Rafael Pineda Ponce Institute (Tres de Mayo)

The execution of the experiment at primary school lecture on solid waste issues motivated pupils on the environmental problems. The majority of pupils listened to the lectures and made discussions and questions full of interest. This experiment made not only the pupils but also to understand how dirty their towns were at present and how important appropriate discharge manner of solid waste was. Their motivation will be expanded to consider how they should go about making their towns clean and beautiful through the continuos sanitary education programs.

The positive response of the youth during the lecture helped affirm that the education conference held by the Counterpart and the Team was very effective in enhancing public awareness and encouraging public cooperation.

Table 14-8: Participant Students

School Name & Location	No. of Attendees	Total Number of Students	Education Level
Rafael Pineda Ponce Institute Tres de Mayo	60	1,500	Primary, junior and senior high school students
Monseñor Luis Alfonso Santos Institute Tres de Mayo	30	320	Primary students
Jorge Fidel Durón School Ayestas	20	213	Primary students

The conference on solid waste issues was held according to the following schedule:

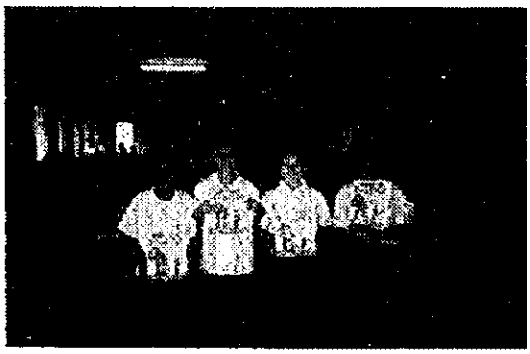
Table 14-9: SW Education Program

Time	Subject	Resource Person / Speaker
9.00 – 9.15	Introduction	Rafael Pineda Ponce Institute representative
9.15 – 9.30	Presentation of a video on solid waste issues	Mr. Masaharu Kina JICA study team member
9.30 – 9.50	Discussion of educational booklet : "Let's learn about Garbage with Florita and Panchito"	Miss Graciela Castellanos Counterpart (AMDC)
9.50 – 10.05	Break	
10.05 – 10.35	Present situation, problems and solutions related to SW in the Central District (exhibition panels on SW issues)	Mr. Masaharu Kina JICA study team member
10.35 – 10.50	Resident participation and cooperation	Mr. Jorge Rodriguez JICA study team member
10.50 – 11.00	Closing speech by school principals	Principals of the three schools involved

1) Educational Booklet on Solid Waste Issues

The counterpart prepared an educational booklet, which is an integral part of the "Campaign for Raising Awareness on Solid Waste Issues", with the support of the study team. The educational booklet was titled *"Let's learn about Garbage with Florita and Panchito"* and designed with schoolchildren in mind.

This educational booklet may be considered a part of the education program as it introduces preventive rather than corrective sanitary and environmental education measures to schoolchildren and the community residents. The design of the booklet was made taking the following factors into consideration:



Educational booklets distributed to schoolchildren

- 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 caricature illustrations to attract the attention of children and avoid boredom.
- Impersonal text, with a vocabulary not restricted to any particular age, gender, income, social, religious or interest group.
- Text and illustration showing present situation (harmful consequences) of the marginal areas surrounding the capital city and adequate measures to avoid such consequences (including the benefits that the adequate measures mat incur).

The content of the educational booklet *"Let's learn about Garbage with Florita and Panchito"* was also identified with the campaign message for purposes of reinforcement and consistency.

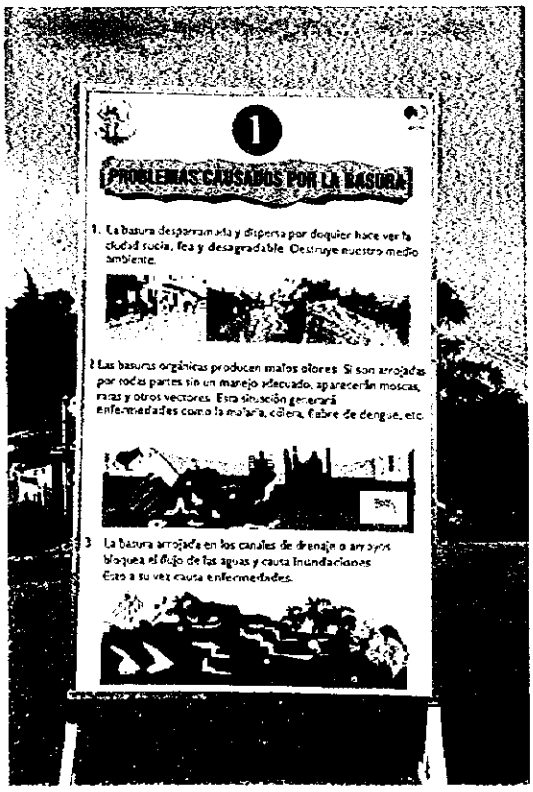
2) Educational Panels

The study team designed ten educational panels (0.90m x 1.50m) related to solid waste issues, targeting the general population of the Central District, with colorful presentations, texts and illustrations showing harmful consequences and their adequate countermeasures.

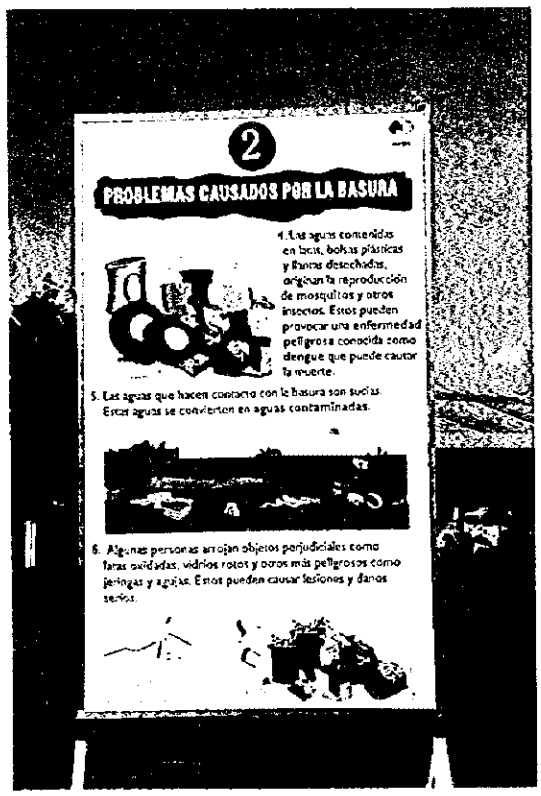
These educational panels were prepared for use in seminars, education workshops, school lectures, "mobile municipality" program and other cultural events, to enhance public awareness and encourage public cooperation.

EDUCATIONAL PANELS

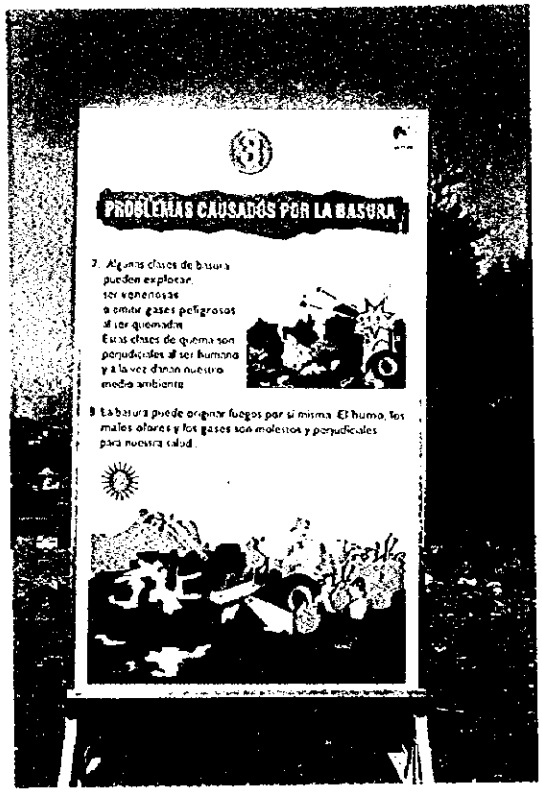
EXHIBITION OF EDUCATIONAL PANELS



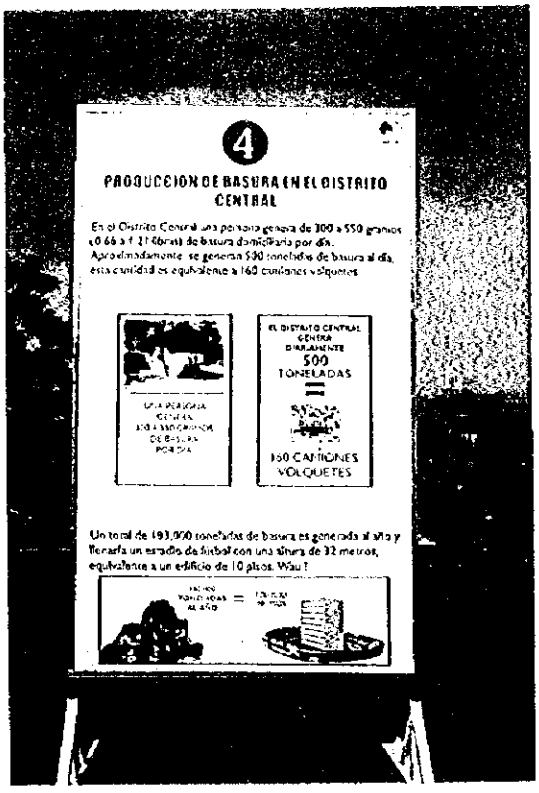
❶ PROBLEMS CAUSED BY WASTE



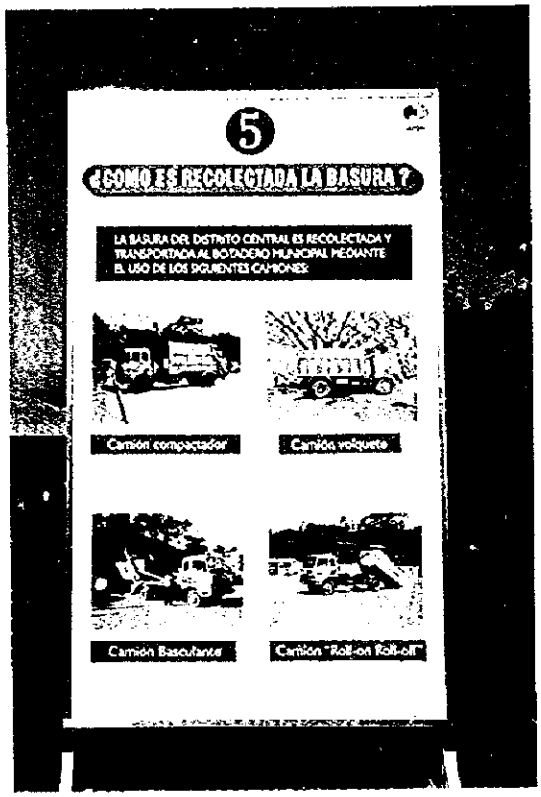
❷ PROBLEMS CAUSED BY WASTE



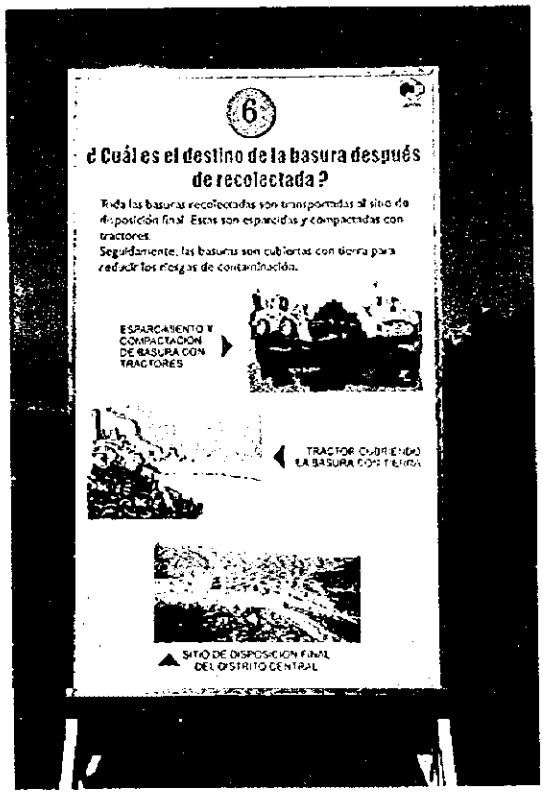
❸ PROBLEMS CAUSED BY WASTE



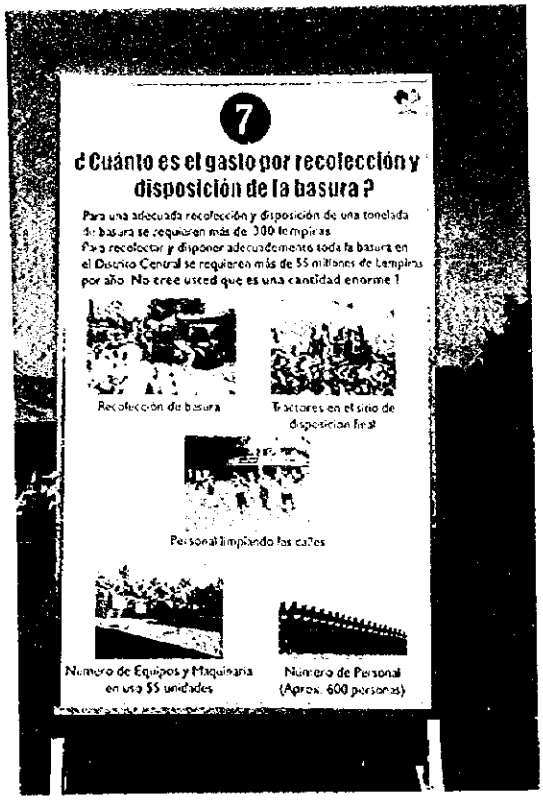
❹ WASTE PRODUCED IN THE CENTRAL DISTRICT



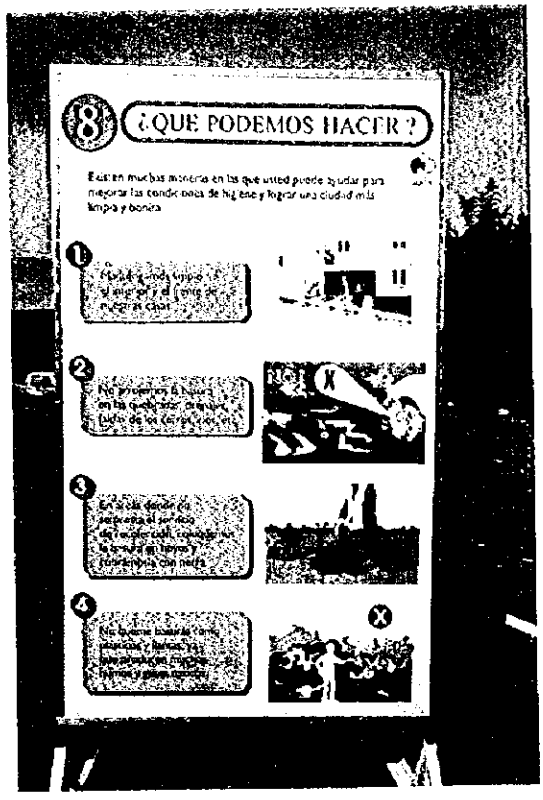
❺ WASTE COLLECTION METHODS



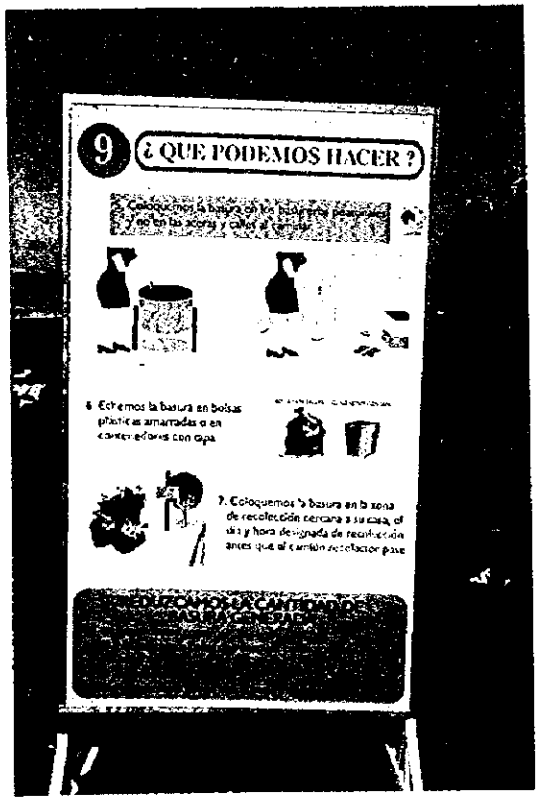
❻ FINAL DESTINATION OF WASTE AFTER COLLECTION



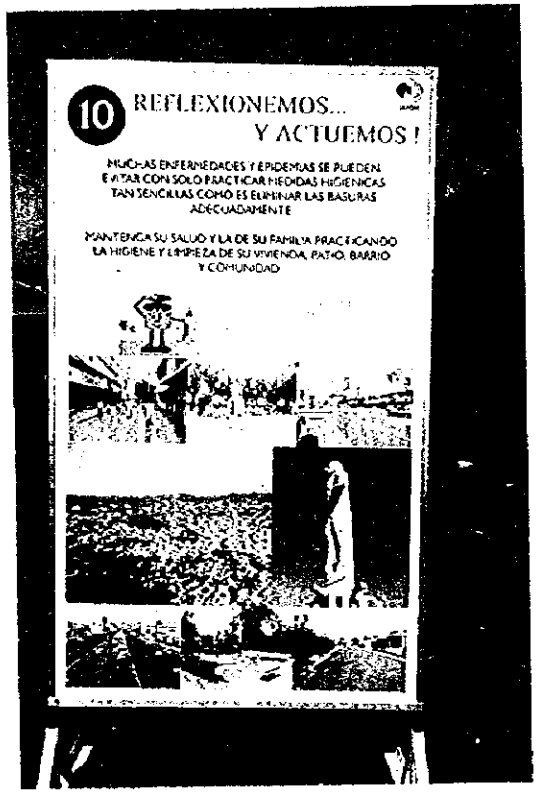
❼ WASTE COLLECTION AND DISPOSAL EXPENDITURES



❽ WHAT TO DO ABOUT WASTE ?



❾ WHAT TO DO ABOUT WASTE ?



❿ THINK ABOUT OUR ACTIONS AND ACT

3) Educational Video

For the target area groups (institutional organizations, community organizations, schools, etc.), an educational video was prepared by the counterpart with the help of the team. The video focused on waste problems and their effects on the residents. It was produced in a manner that would appeal to the sense of community and brotherhood, and enhance public awareness by transmitting and promoting basic information on waste problems to the population, in order to develop attitudes and practices helpful to SWM improvement.

14.2.9 Conclusion

The execution of the campaign project and the presentation of educational panels and films opened the eyes of the people to the environmental problems that currently prevail. The majority of community leaders and residents participated and cooperated fully during the campaign project.

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

Many people understand that the conduct of the campaign and sanitary education programs would significantly contribute to solving 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 pilot projects.

The method of community education on solid waste used for the experiment was found to be very effective in San Martin, Ayestas and Tres de Mayo. Aside from slight modifications in accordance with town/city characteristics, the method is considered applicable to many areas and other cities in Honduras as well.

14.3 Experiment on the Implementation of the Best Collection System for Marginal Areas

14.3.1 Implementation of the Best Collection System for Marginal Areas

As stated in the previous section, marginal areas do not receive satisfactory refuse collection service. The services are either irregular or, in some cases, not provided at all.

The lack of adequate refuse collection equipment, the unfavorable topography, and poor roads intensify collection service difficulties. Further, slopes and narrow roads are not easily accessible to collection vehicles especially in the raining season.

Since illegal dumpsites have been observed to exist especially in slopes and vacant lands, the topographical constrain of these areas has been raised as a critical sanitation and environmental problem.

To cope with this topographic impediment, the study team suggested, in the Master Plan, the adoption of the point collection system using containers. This system is expected to curtail service running expenses.

Illegal dumping area in San Martin

To confirm the feasibility of this idea, the study team requested AMDC to select an area where the proposed collection system may be experimentally executed. AMDC nominated several fringe areas for the experiment.

The study team surveyed these candidate sites in the engineering point of view and a questionnaire survey in March 1998 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 the counterpart. Then the *colonias* of San Martín, Ayestas and Tres de Mayo were selected for the experiment.

14.3.2 Plan of the Pilot Project

The main purposes of the experiment are to determine the following:

1) Acceptability of a point collection system (using containers) to the residents. Although the system can reduce cost, it definitely needs the contribution of the residents to function effectively.

2) Willingness of the residents to form a community groups or associations that will supervise activities to keep the community and the surroundings of the containers clean.

3) Willingness of the residents to pay a waste collection fee fixed by the municipality and other fees to a member of the community to collect and discharge the waste into the containers.

The basic issues to be confirmed through the experiment are as follows:

i. Confirm whether the point collection system using containers is indeed the best collection system for marginal areas.

ii. Gain the residents' confidence by providing a periodical refuse collection service using containers.

iii. Gain the cooperation of the residents in the proper discharge of wastes and in the maintenance of the refuse collection points.

iv. Implementation of public education programs and explanation of the experiment by the municipality and/or the authorities concerned,

v. Data collection (amount of waste collected, collection frequency, etc.).

14.3.3 Execution of the Pilot Project

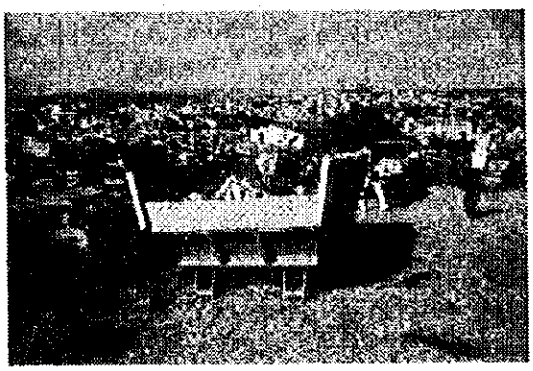
Prior to the experiment, the counterpart and the study team conducted a questionnaire survey to obtain data on refuse collection points using containers, residents willingness to cooperate in keeping the surrounding of the containers clean, and the residents willingness to pay a refuse collection fee.

The study team and the counterpart team, which consisted of the staff of AMDC and the Health Center of Tres de Mayo, held a series of meetings with community leaders and the residents, to explain the purpose of the pilot project, the project impacts on their daily lives, and the new refuse collection system.

The municipality and the Health Center of Tres de Mayo organized a car with loud speaker to broadcast to the residents that waste containers will be installed and to request their cooperation in keeping the community clean.

The experiment begun on July 18 in the steep area A1 (San Martín/Ayestas North) and on July 25 in the steep area A2 (Tres de Mayo/Ayestas West), in conjunction with the clean-up operation activities.

Due to time restrictions, the collection system experiment was implemented only for 3 weeks. However, during this period the residents were observed to be adequately and effectively using the system.



Container installed in Area A1 (3-57)

During the first week, the containers ($5.5m^3$) located in the steep area A1 (San Martin) and the steep area A2 (Tres de Mayo) become completely full in about 4 or 5 days, as they were used not only by the residents of areas without regular collection service but by all residents living nearby.

Thanks to the efforts of AMDC and Health Center of Tres de Mayo to disseminate information concerning the use of the containers, and especially to the cooperation of the residents of the areas involved, the experimental implementation of the system was effectively carried out.

14.3.4 Conclusion

The results of the questionnaire survey carried out in March 1998 on 100 residents (See Annex A) indicate that almost half of the pilot project areas (*colonias* of San Martín, Ayestas and Tres de Mayo) were not receiving an adequate waste collection services, resulting in the illegal dumping of wastes in sloped areas and vacant lands by almost 43% of the residents (mostly by the residents of San Martín).

From July 1998, however, the AMDC, with the help of the study team, provided waste collection service through the installation of containers in selected areas in San Martín (A1) and Tres de Mayo (A2).

The selection of the container collection system as the best collection system, was recommended in view of the poorly maintained access roads and the slopes, factors which limited the access of regular collection vehicles.

The results of another questionnaire survey, with 100 resident participants after the implementation of the "Campaign for Raising Awareness on SW Issues", clean-up operations, and the collection system experiment, indicated that 62% of the respondents used the containers. The remaining 38% stated that they either received regular collection services from AMDC or were unable to use the containers because of their distance.

The residents basically understood the container collection system, thanks mainly to the instructions given in the workshops. Due to time restrictions, however, it was impossible to confirm whether the residents kept the areas surrounding the containers clean. Nonetheless, there was no waste discharge in illegal dumpsites (A1 & A2) after the cleansing activities.

The campaign project, clean-up operations, and the collection experiment, carried out in the pilot project areas, helped to promote SWM improvement in other neighboring *colonias*, such as Zapote Norte west of Tres de Mayo, that requested the AMDC to provide equipment and a container for cleansing activities. The clean-up operation of Zapote Norte which took place on August 8, was carried out by the initiative of the residents, with the AMDC providing the cleansing equipment and the container.

Although there was a time constraint, it was possible to confirm, through the evaluation of the proposed objectives, that the experimental collection system were successful. The results were promising as residents in beneficiary areas were highly cooperative. Further, public motivation in the project areas spread to other neighboring *colonias*, that undertook their own clean-up operations with the help of the AMDC. The residents efforts are highly commedable and are seen as an invaluable achievement of this experiment.

Appendix – A

Contents

1 Public Opinion Survey in Marginal Areas for the Pilot Projects

1.1 Questionnaire Survey Formats

a. Questionnaire Survey Format (Before)

b. Questionnaire Survey Format (After)

1.2 Sampling Area and Number of Interviewees (Before and After)

1.3 Results of the Questionnaire Surveys

1.3.1 Problems of Waste (Before and After)

1.3.2 Breakdown of the Problems related to Refuse (Before and After)

1.3.3 Waste Collection Service (Before and After)

a. Waste Collection Before the Implementation of the Campaign

b. Waste Collection After the Implementation of the Campaign and the Best Collection System

c. Willingness to Pay a Fee

1.3.4 Campaign for Raising Awareness on Solid Waste Issues (Before and After)

a. Knowledge of the "Campaign for Raising Awareness on Solid Waste Issues"

b. Public Awareness

c. Public Cooperation and Participation

d. Public Education

e. Necessity of Public Cooperation and Campaign

f. General Impression After Clean-up Operations

1.4 Conclusion

Tables

Table A-1(a) Questionnaire on SW Problems and Collection Service (3 sheets)

Table A-1(b) Questionnaire on Collection Service and Campaign for Raising Awareness on Solid Waste Issues (3 sheets)

1 Public Opinion Survey in Marginal Areas for the Pilot Projects

The results of the public opinion survey were taken into consideration to plan the pilot projects: "Campaign for Raising Awareness on Solid Waste Issues" and the "Experiment on the Implementation of the Best Collection System for Marginal Areas".

The results are used to observe the change in degree of public awareness before and after the campaign and check the adaptability of the proposed campaign tools and the implementation of the collection system in marginal areas through pilot projects.

The interview surveys were conducted before and after the implementation of both pilot projects mentioned above by the Counterpart and the JICA Study Team. 100 samples were selected and conducted in the following towns:

- 33 samples from houses and shops located around the "colonia" Tres de Mayo;
- 34 samples from houses and shops located around the "colonia" Ayestas, and
- 33 samples from houses located around the "colonia" San Martín.

1.1 Questionnaire Survey Formats

a. Questionnaire Survey Format (Before)

The following questionnaire survey format was used for the interviews before the implementation of the pilot projects:

QUESTIONNAIRE ON SOLID WASTE PROBLEMS AND CAMPAIGN FOR RAISING AWARENESS ON SOLID WASTE ISSUES					
Survey Location	Tegucigalpa's Central District Place :				
Date of Survey	March ....., 1998				
Sampling Scale	100 people : residents, shop-owners, etc.				
Survey Method	Individual interview				
Name of Interviewee				Age:	Sex:
Address of Interviewee					
Member of the Family	Family Head	Husband	Wife	Son	Daughter
Name of Interviewer					

SOLID WASTE PROBLEMS AND REFUSE COLLECTION SERVICE				
No.	QUESTIONS	Yes	No	Remarks
Q1	Is there any SW problems in your town?			
	If the reply was "NO" to question No.1, do not answer question Q2.			
Q2	These problems are related to :	Yes	No	Remarks
	a. Refuse scattered in the streets			
	b. Refuse scattered in the water courses			
	c. Illegal waste dumping in open areas and hillsides			

	d. Prevalence of mice , rats and vectors			
	e. Proliferation of diseases (diarrhea, dengue, malaria, cholera, and other pathogens)			
	f. Offensive odor caused by illegally dumped garbage			
	g. Smoke caused by burning garbage			
	h. Unaesthetic (unpleasant landscaping)			
Q3	Do you receive the municipality's waste collection service?	Yes	No	
	a. Once a week			
	b. Twice a week			
	c. Once a month			
	d. Others (please specify)			
Q4	Do you pay a fee for the waste collection service?	Yes	No	
	a. How much do you pay per month?			
	b. I do not pay because I don't receive any service. However, if the municipality provides the waste collection services, I will pay the following amounts :			
	c. I do not pay. However, if the municipality provides the services, I will cooperate to maintain the town clean			
Q5	If a container is installed at a certain point, would you cooperate to discharge the waste into the container?	Yes	No	
Q6	If a recycling system is implemented using two containers, one for organic waste and another for inorganic waste, would you cooperate to discharge the waste appropriately into the containers?	Yes	No	

CAMPAIGN FOR RAISING AWARENESS ON SOLID WASTE ISSUES

Q7	Campaign for Raising Awareness on Solid Waste Issues	Yes	No	Remarks
	a. Do you think public awareness regarding the waste problems in the city is adequate?			
	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 to keep the city clean?			
	d. Will you participate and cooperate in clean-up operations for the improvement of sanitary conditions in the city?			
	e. If you answered NO to questions (a), (b) and (c), please specify reasons and measures to be adopted			
	f. Others comments (please specify)			

OTHERS

Others	Questions	Tres de Mayo	Ayestas	San Martin
	a. How much is the monthly family expenditures ? (in Lempiras)			
	b. How much is the monthly family income ? (in Lempiras)			

b. Questionnaire Survey Format (After)

The following questionnaire survey format was used to observe the change in degree of public awareness before and after the campaign and check the adaptability of the proposed campaign tools and the implementation of the collection system in marginal areas.

QUESTIONNAIRE ON SOLID WASTE PROBLEMS AND CAMPAIGN FOR RAISING AWARENESS ON SOLID WASTE ISSUES					
Survey Location	Tegucigalpa's Central District Place :				
Date of Survey	July 28, 1998				
Sampling Scale	100 people : residents, shop-owners, etc.				
Survey Method	Individual interview				
Name of Interviewee				Age:	Sex:
Address of Interviewee					
Member of the Family	Family head	Husband	Wife	Son	Daughter
Name of Interviewer					

SOLID WASTE PROBLEMS				
No.	**Questionnaire**	**Yes**	**No**	**Remarks**
Q1	Are there SW problems in your town?			
	If the reply was "Yes" to question Q1, please answer Q2.			
Q2	These problems are related to:	Yes	No	Remarks
	a. Refuse scattered in the streets			
	a. Illegal waste dumping in open areas and hillsides			
	b. Prevalence of mice, rats and vectors			
	c. Proliferation of diseases (diarrhea, dengue, malaria and other pathogens)			
	d. Offensive odor caused by illegally dumped garbage			
	e. Smoke caused by burning garbage			
	f. Unaesthetic (unpleasant landscaping)			
IMPLEMENTATION OF THE BEST COLLECTION SYSTEM FOR MARGINAL AREAS				
Q3	Did you use the container to discharge the waste?	Yes	No	
Q4	Did the waste collection system using the container satisfy you?	Yes	No	
Q5	Was the installation of the container useful for maintaining the community cleanly?	Yes	No	
Q6	From Q3: Why did not you use the container?			
	a. Because there is waste collection service [ ]			
	b. Because the container was far from the house 50 m [ ] 100 m [ ] 200 m or more [ ]			
	c. Others (please specify)			
Q7	Are you willing to form communal groups or neighbor associations for maintaining the community and the area around the containers cleanly?	Yes	No	
Q8	Are you willing to pay a fee of more than L 5.00 monthly fixed by the Municipality to improve the collection service?	Yes	No	
Q9	Are you willing to pay a fee of L 3.00 to L 5.00 to a member of your community to collect and discharge your waste into the containers?	Yes	No	
CAMPAIGN FOR RAISING AWARENESS ON SW ISSUES				
Q10	a. Do you know of the public campaign "Lets make our Capital the most clean and beautiful city" under the slogan: "Clean Capital Happy Citizen"?	Yes	No	

	b.	Did you participate and cooperate in the clean-up operations executed in your "colonia"?	Yes	No	
	b1	*If your reply was Yes, specify where (please answer only one answer):*			
		- Inside my house			
		- In front of my house			
		- In the streets			
		- In the steep area A1(San Martin / Ayestas)			
		- In the steep area A2 (Tres de Mayo / Ayestas)			
		- In both steep areas A1 and A2			
	b2	*If your reply was No, please specify reasons:*			
		- Personal reasons			
		- I had no interest			
	c.	Do you think the campaign and the clean-up operations executed in your "colonia" contributed for raising public awareness?	Yes	No	
	d.	Did you observe any positive change in the attitude of your community regarding the waste problems?	Yes	No	
	e.	What is your impression of the sector where the clean-up operation was executed comparing before and after the clean-up operation?	Better than before	Same	
	f.	Do you think public campaigns are necessary for the improvement of sanitary conditions in your "colonia"?	Yes	No	

1.2 Sampling Area and Number of Interviewees (Before and After)

Two public opinion surveys were carried out before and after the implementation of the pilot projects. The first public opinion survey (before: March 12th, 1998) and second public survey (after: August 28th,1988) were conducted by the Counterpart and the JICA Study Team among 100 residents of the *colonias* of Tres de Mayo, Ayestas and San Martín, located at the northwest of the Central District.

These *colonias* were selected as the survey areas because of the serious sanitary problems and the homogenous characteristics of environmental problems found among the areas surrounding the city.

The number of interviewees of both before and after surveys by towns are shown in the following table:

Town	Sampling Area (ha)	Number of Interviewees	Remarks
Colonia Tres de Mayo	45	33	Regular critical area
Colonia Ayestas	40	34	Regular critical area
Colonia San Martin	15	33	Most critical area
Total	100	**100**	

The answer to all questions stated below are expressed numerically which is equivalent to the percentage of the total number of respondents in each area, as tabulated in Q1 to Q7 (before) and Q1 to Q10 (after).

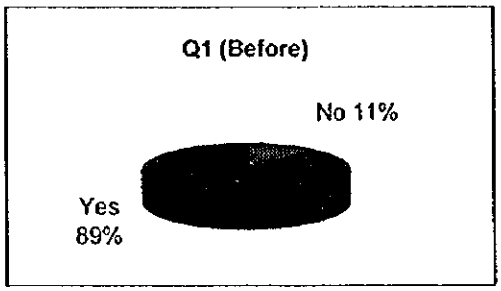
1.3 Results of the Questionnaire Surveys

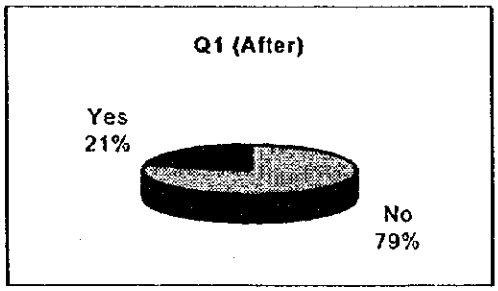
1.3.1 Problems of Waste (Before and After)

Area	Answer	Before		After	
		People	Area (%)	People	Area (%)
Tres de Mayo	Yes	28	85	7	21
	No	5	15	26	79
Ayestas	Yes	30	88	10	29
	No	4	12	24	71
San Martin	Yes	31	94	4	12
	No	2	6	29	88
Total	Yes	**89**	**89**	**21**	**21**
	No	**11**	**11**	**79**	**79**

During the questionnaire survey (before), 89% of the respondents stated that there are refuse problems and only 11% answered that there are no problems. The results of the survey indicate the magnitude of the refuse problems and the lack of an appropriate SWMS in the survey areas.

After the implementation of the campaign project the figures were changed from 89% to 21% who answered that there are refuse problems and from 11% to 79% who answered that do not exist problems. These results are products of the campaign and the clean-up operations carried out by the residents in marginal areas.





1.3.2 Breakdown of the Problems related to Refuse (Before and after)

Q2 These problems are related to :	Number of answers or (%)			
	Before		After	
	Yes	No	Yes	No
a. Refuse scattered in the streets	87	13	16	84
b. Illegal waste dumping in open areas and hillsides	79	21	8	92
c. Prevalence of mice , rats and vectors	71	29	7	93
d. Proliferation of diseases (diarrhea, dengue, malaria, and others pathogens)	57	43	9	91
e. Offensive odor caused by illegally dumped garbage	73	27	8	92
f. Smoke caused by burning garbage	73	27	7	93
g. Unaesthetic (unpleasant landscaping)	82	18	5	95

As can be seen from the results of Q2 (before), the figure shows that the majority of the problems related to refuse exceed 71%, except the proliferation of diseases with 57%. This latter figure is, however, excessively high and undesirable for a capital city.

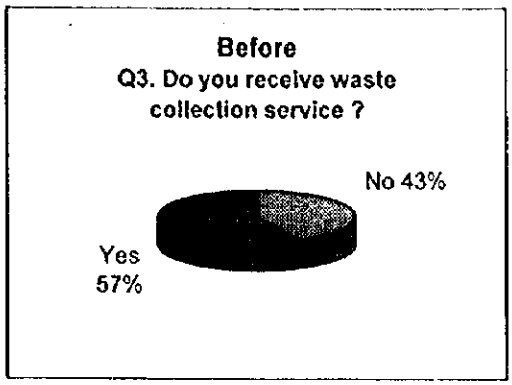
However, after the implementation of the campaign, the problems of refuse fall down between 5% to 16%. The highest figure (16%) remain to refuse scattered in the streets.

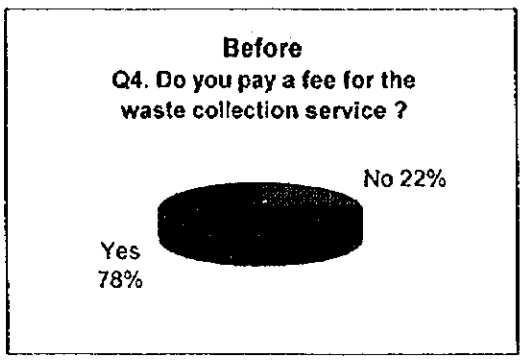
1.3.3 Waste Collection Service (Before and After)

Questionnaire (Before)		Before		After		Questionnaire (After)	
		Yes	No	Yes	No		
Q3	Do you receive the municipality's waste collection service?	57	43				
Q4	Do you pay a fee for the waste collection service?	78	22				
Q5	If a container is installed at a certain point, would you cooperate to discharge the waste into the container?	99	1	62	38	Did you use the container to discharge the waste?	Q3
				88	12	Did the waste collection system using the container satisfy you?	Q4
				88	12	Was the installation of the container useful for maintaining the community cleanly?	Q5
Q6	If a recycling system is implemented using two containers, one for organic waste and another for inorganic waste, would you cooperate to discharge the waste appropriately into the containers ?	100	0			Refer Table A-1(b): Questionnaire on Collection System and Campaign for Raising Awareness on Solid Waste Issues	Q6
				89	11	Are you willing to form a communal group or neighbor association for maintaining the community and the area around the containers cleanly?	Q7
				85	15	Are you willing to pay a fee of more than L 5.00 monthly fixed by the Municipality to improve the collection service?	Q8
				80	20	Are you willing to pay a fee of L 3.00 to L 5.00 to a member of your community to collect and discharge your waste into the containers?	Q9

a. Waste Collection Service Before the Implementation of the Campaign

Q3. As shown in the figure, 57% of the interviewees receive refuse collection service once a week (every Wednesday) and the remaining 43% do not receive any service. The majority of the population that not receive the refuse collection service reside in the town of San Martin where sanitary and environmental problems are more common.

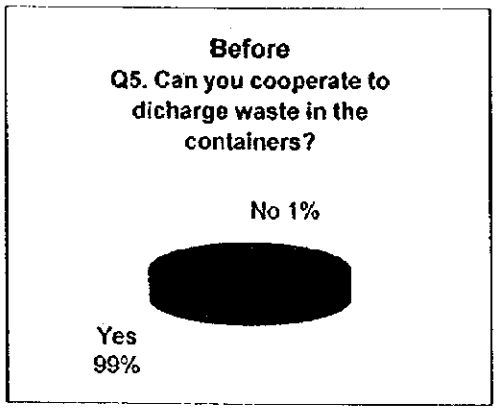


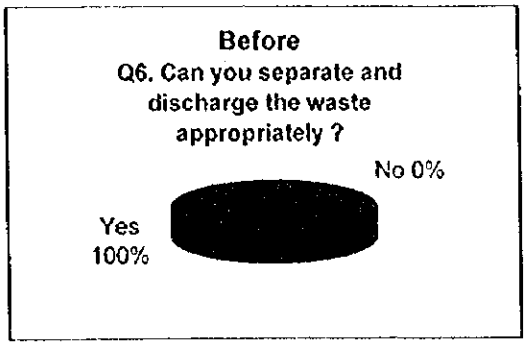


Q4 shows the number of residents who pay the refuse collection fee. 78% of the interviewees stated that they pay the collection fee. Among them, some residents answered that they pay the fees although they do not receive any service. Twenty two percent of the interviewees either do not pay or they don't know whether they pay the tariff.

Among the non fee payers, the majority (91%) are willing to pay 10 to 20 Lempiras per month on average if the AMDC extends and improves the collection service. The remaining non fee payers (9%) replied that they are unable to pay due to economic reasons. However, the majority stated that they will cooperate to maintain the town clean if the AMDC extends the refuse collection service.

Q5. Practically all of the interviewees stated that they would cooperate to discharge the refuse appropriately if a container is installed for its disposal as shown in figure. This positive result and the high interest demonstrated by 99% of the interviewees justifies the implementation of the best collection system, which consists of the installation of containers at a certain locations within the marginal areas and extension of collection service by AMDC.

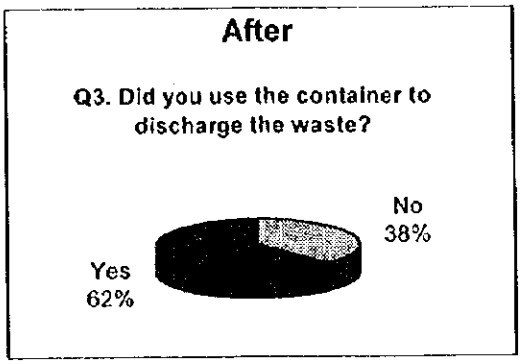




Q6. As the previous question, the majority of the interviewees (100%) answered that they would cooperate with the recycling system by disposing the organic and inorganic wastes separately in the containers installed for that purpose. This also justifies the implementation of the experiment described above.

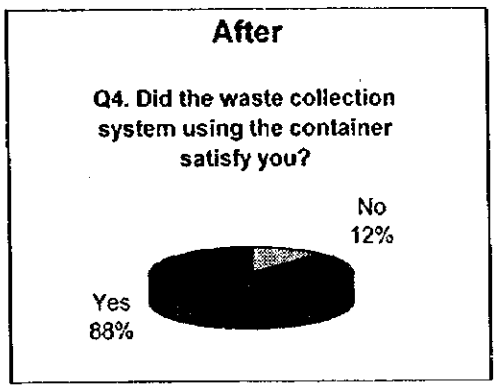
a. Waste Collection Service After the Implementation of the Campaign and the Best Collection System

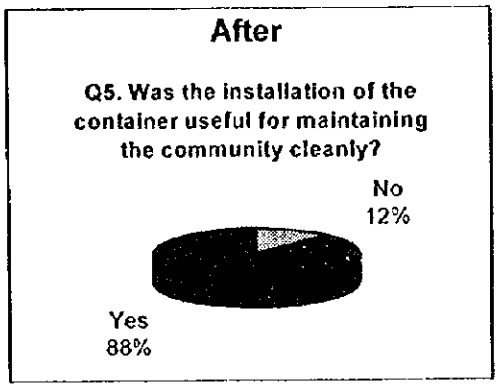
Q3. After the implementation of the campaign (clean-up operations and installation of the containers in the marginal areas) almost 62% of the interviewees stated that they used the containers. The remaining 38% answered not use the containers because they receive the regular service collection provided by the municipality.



Q4. The majority of the interviewees (88%) is satisfied with waste collection using the containers, even those receive regular refuse collection service provided by the municipality.

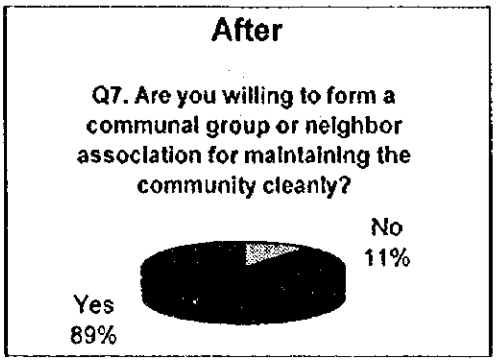
Q5. Same number of the interviewees (88%) answered that the installation of the containers was useful for maintaining the community cleanly.





Q6. 35% of the interviewees answered not use the containers because there is waste collection service. However,

some of them stated to use periodically. Only 7% of the respondents affirmed not use because the containers are far from the house.

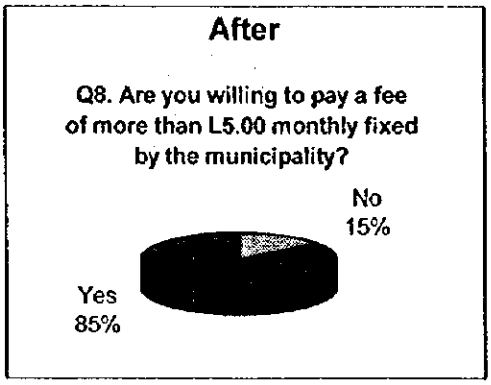


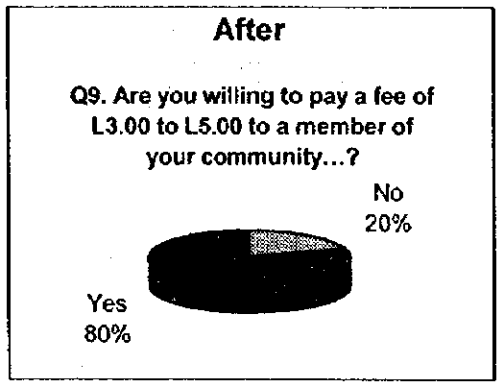
Q7. Concerning the willing to form a communal group or neighbor association for maintaining the community and the area around the container cleanly, the majority of the respondents (89%) answered positively.

b. Willingness to Pay a Fee

Eighty five percent of the respondents answered that they willing to pay a fee of 5.00 Lempiras monthly fixed by the municipality to improve the collection service. Also, almost the same number of persons (80%) are willing to pay a fee of 3.00 to 5.00 Lempiras to a member of the community to collect and discharge the waste into the containers.

The result demonstrates the people's interest and willingness to improve the waste problems of their community.





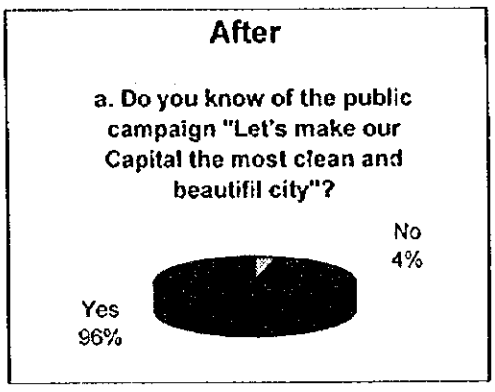
1.3.4 Campaign for Raising Awareness on Solid Waste Issues (Before and After)

Before and after the implementation of the "Campaign for Raising Awareness on Solid Waste Issues" and the clean-up operations in the marginal areas, the following opinions were obtained from the public:

Q	Questionnaire (Before)	Before (%)	Answer	After (%)	Questionnaire (After)	Q
			Yes	96	Do you know of the public campaign "Let's make our Capital the most clean and beautiful city" under the slogan: "Clean Capital Happy Citizen"?	a
			No	4		
d	Will you participate and cooperate in clean-up operations for the improvement of sanitary conditions in the city?	97	Yes	75	Did you participate and cooperate in the clean-up operations executed in your *colonia*?	b
		3	No	25		
a	Do you think public awareness regarding the waste problems in the city is adequate ?	22	Yes	92	Do you think the campaign and the clean-up operations executed in your *colonia* contributed for raising public awareness?	c
		78	No	8		
b	Do you think public education is necessary for the improvement of sanitary conditions in the city?	99	Yes	91	Did you observe any positive change in the attitude of your community regarding the waste problems?	d
		1	No	9		
c	Do you think public cooperation is necessary to keep the city clean ?	100	Yes	100	Do you think public campaigns are necessary for the improvement of sanitary conditions in your *colonia*?	f
		0	No	0		
		Better than before		97	What is your impression of the sector where the clean-up operation was executed comparing before and after the clean-up operation?	e
		Same		3		

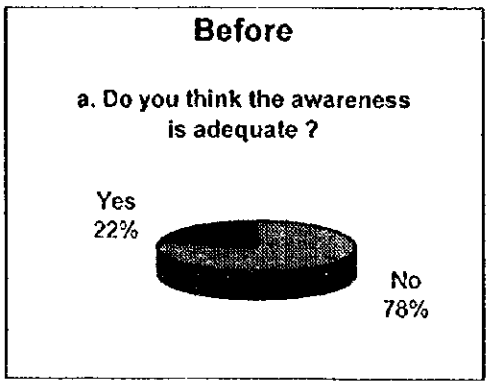
a. Knowledge of the "Campaign for Raising Awareness on Solid Waste Issues"

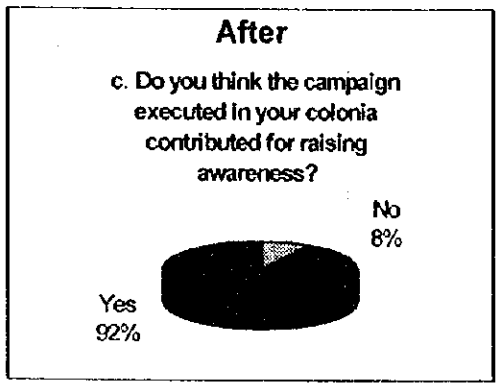
The accomplishments of the goals related to the campaign objectives were achieved effectively. The campaign *"Let's make our Capital the most clean and beautiful city"* carried out in July was known by almost 96% of the interviewees and was successfully promoted public awareness and introduced public cooperation in the whole city.



b. Public Awareness

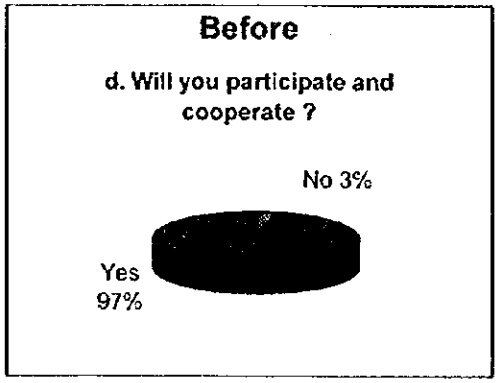
As shown in the figures below, **before** the implementation of the campaign, the majority of the interviewees (78%) stated that there is not enough public awareness and only 22% of the people interviewed answered that public awareness is adequate. However, **after** the implementation of the campaign increased to 92% who answered that public campaign contributed for raising awareness. This implies that the public campaign carried out by the Counterpart and the Team, have positively influenced the people's awareness and behavior during the campaign period. Due to campaign activities through the implementation of meetings and 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.

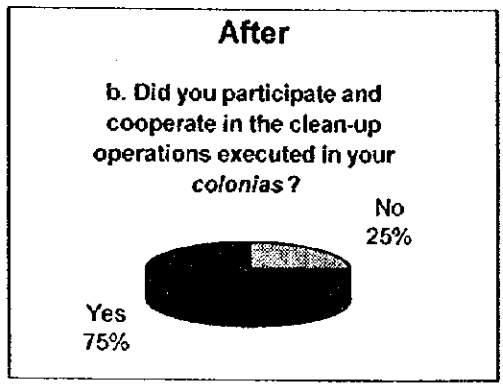




c. Public Cooperation and Participation

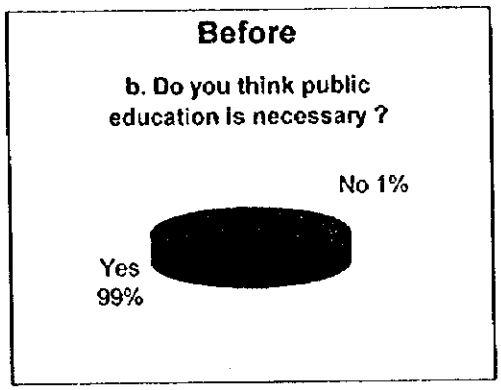
Regarding the willingness to participate and cooperate, 97% of the interviewees in the questionnaire (before) stated to participate and cooperate for the maintenance of a clean living environment. In the survey (after), almost 75% of the interviewees answered that they participated and cooperated. These public cooperation and participation were successfully attained during the campaign period, which was demonstrated in clean-up operations days carried out in the pilot project areas.

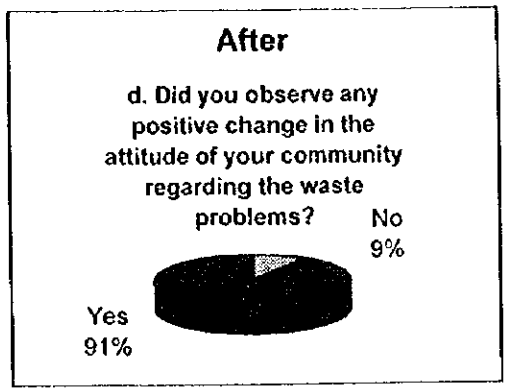




d. Public Education

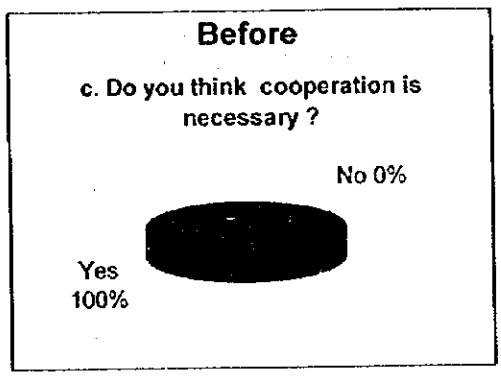
In the survey (before) all the interviewees (100%) said that public education is necessary for the maintenance of a clean living environment. After the implementation of the campaign, 91% answered that positive change in the attitude of the community regarding the waste problems. This result was attained due to the guidance given to the residents through meetings and education workshops carried out in the pilot project areas.

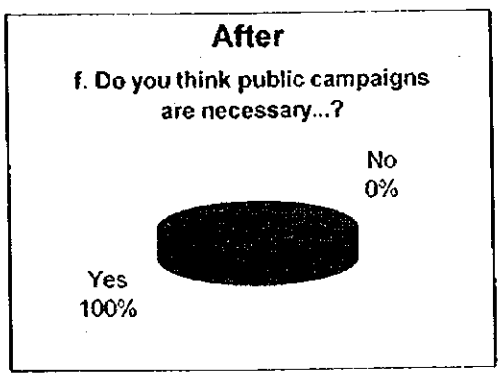




e. Necessity of Public Cooperation and Campaign

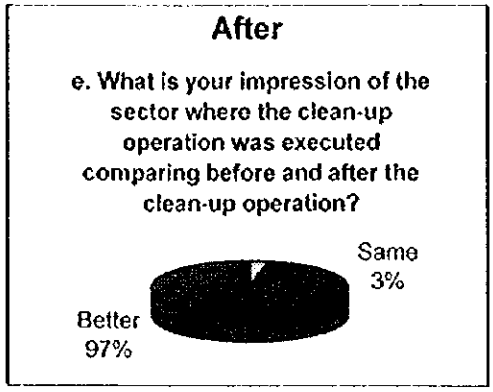
Both surveys before and after, 100% of the interviewees stated that public cooperation is necessary for maintaining the city clean and public campaigns are necessary for the improvement of sanitary conditions in their towns.





f. General Impression After Clean-up Operations

The final question regarding the general impression of the sector where the clean-up operations were executed, 97% (except 3%) of the interviewees stated that the general aspect of the *colonias* was better than before the project campaign.
These figures show's the successful result of the clean-up operations carried out in the pilot project areas.



1.4 Conclusion

The questionnaire survey carried out in the pilot project areas *before* and *after* the public campaign revealed the significance of public awareness and education in making the Capital City a pleasant place to live in. The campaign message *"Let's make our Capital the most clean and beautiful city"*, also accentuated the importance of the cooperation and participation of relevant organizations, community organizations and the public in general for maintaining the city clean and aesthetically sound.

As stated in the main report, public awareness and education are fundamental to the accomplishment of goals related to SWM improvement in the Central District. Therefore, in the pilot project areas, efforts have been made to enhance public awareness and transmit relevant knowledge through public education programs during the campaign. The campaign proved the communities' willingness to cooperate and participate in cleansing activities to keep the city clean and safe.

From the results of both surveys carried out can be observed that the public awareness has increased after the "Campaign for Raising Awareness on Solid Waste Issues". And the adoption of a sound waste disposal habits by the residents through the "Implementation of the Best Collection System for Marginal Areas" demonstrated that the objectives of the pilot projects were successfully attained.

Table A-1(a) Questionnaire on SW Problems and Collection Service

NO.	LOCATION/NAME	Q1		Q2														COLLECTION SERVICE					
				a		b		c		d		e		f		g		P3		P4		P5	
		YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA TRES DE MAYO																						
1	Elbia Rosa Reyes		1		1		1		1		1		1		1		1		1		1		1
2	Santos Julio Rubio	1		1			1		1		1		1		1		1	1		1		1	
3	Isabel Ochoa		1		1		1		1		1		1		1		1		1		1		1
4	Carmen Delia V.		1		1		1		1		1		1		1		1	1		1		1	
5	Maria Giron	1			1	1			1		1		1		1		1		1	1	0	1	0
6	Orlando Vargas		1		1		1		1		1		1		1		1		1	1	0	1	0
7	Glenda Suyapa		1		1		1		1		1		1		1		1	1		1		1	
8	Anselmo Sierra		1		1		1		1		1		1		1		1		1	1	0	1	0
9	Ramona Amador		1		1		1		1		1		1		1		1		1	1	0	1	0
10	Maira Flores		1		1		1		1		1		1		1		1	1		1		1	
11	Guillermo Flores		1		1		1		1		1		1		1		1		1	1		1	
12	Martha Isabel Cruz	1		1			1		1		1		1		1		1		1	1		1	
13	E. Hernandez	1			1		1		1	1			1		1		1		1		1		1
14	Maria de los Angeles		1		1		1		1		1		1		1		1	1		1		1	
15	Juan de la Cruz		1		1		1		1		1		1		1		1	1		1		1	
16	Reina Valladares		1		1		1		1		1		1		1		1	1		1		1	
17	Odilia Moreira de Sosa		1		1		1		1		1		1		1		1	1		1		1	
18	Juana Hernandez		1		1		1		1		1		1		1		1	1		1		1	
19	Waleska Ponce		1		1		1		1		1		1		1		1	1		1		1	
20	D. Jesseth Palma		1		1		1		1		1		1		1		1	1		1		1	
21	Rosa Maribel Andino		1		1		1		1		1		1		1		1		1	1		1	
22	Celina Gomez	1		1			1		1		1		1		1		1		1	1		1	
23	Teresa Moran		1		1		1		1		1		1		1		1	1		1		1	
24	Esemilda Barrilla		1		1		1		1		1		1		1		1		1		1		1
25	Eliset Mendoza		1		1		1		1		1		1		1		1		1	1		1	
26	Maria Antonia Garcia	1			1		1		1		1	1			1		1		1	1		1	
27	Teresa Sanchez	1			1		1		1		1	1			1		1	1		1		1	
28	Cesar Eugenio Torres		1		1		1		1		1		1		1		1		1	1		1	
29	Petronila Medina		1		1		1		1		1		1		1		1		1	1		1	
30	Celina Romero		1		1		1		1		1		1		1		1		1	1		1	
31	Keidi Ramirez		1		1		1		1		1		1		1		1	1		1		1	
32	Maria Martinez		1		1		1		1		1		1		1		1	1		1		1	
33	Gladis Boquedano		1		1		1		1		1		1		1		1	1		1		1	
33	Sub-Total	7	26	3	30	1	32	0	33	1	32	2	31	0	33	0	33	15	18	28	5	28	5

NO.	LOCATION/NAME	Q1		Q2														COLLECTION SERVICE					
				a		b		c		d		e		f		g		P3		P4		P5	
		YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA AYESTAS																						
1	Eugenia Ferrera	1		1			1		1		1		1		1		1		1	1	0	1	0
2	Oscar M. Diaz	1		1		1		1		1		1		1		1		1		1		1	
3	Miriam Pacheco	1		1		1		1		1		1		1		1			1		1		1
4	Esteban Pavon		1		1		1		1		1		1		1		1	1		1		1	
5	Ventura Avila Lopez	1		1		1		1		1		1		1			1		1		1		1
6	Rosa Emilia Marin		1		1		1		1		1		1		1		1		1		1		1
7	Jose H. Villalta	1		1		1		1		1		1		1		1		1		1		1	
8	Ramona Rivera	1		1		1		1		1		1		1		1			1	1		1	
9	Modesta		1		1		1		1		1		1		1		1	1		1		1	
10	Jose F. Martinez	1		1		1		1		1		1		1			1		1		1		1
11	Alicia V. Lozano		1		1		1		1		1		1		1		1	1		1		1	
12	Lizette Arias Sanchez		1		1		1		1		1		1		1		1		1	1	0	1	
13	Vilma Padilla Moncada		1		1		1		1		1		1		1		1	1		1		1	
14	Emma Rubenia Giron		1		1		1		1		1		1		1		1	1		1		1	
15	Doris Suyapa Cruz		1		1		1		1		1		1		1		1		1	1		1	
16	Maria Elena Garcia		1		1		1		1		1		1		1		1		1	1		1	
17	F. Francisca Martinez		1		1		1		1		1		1		1		1	1		1			1
18	Jose Ramon Duron		1		1		1		1		1		1		1		1	1		1		1	
19	Luis Fernando Sanchez		1		1		1		1		1		1		1		1	1		1		1	
20	Henry Giron trinidad		1		1		1		1		1		1		1		1	1		1		1	
21	Deisy Bustillo		1		1		1		1		1		1		1		1	1		1		1	
22	Lesly Suyapa Rivera	1		1			1		1		1		1		1		1	1		1		1	
23	Florentina		1		1		1		1		1		1		1		1	1		1		1	
24	Maria Antonia Cortes	1			1		1	1		1			1	1			1	1		1		1	
25	Marco Antonio C.		1		1		1		1		1		1		1		1		1		1		1
26	Maria Eugenia Amador		1		1	1			1	1			1		1		1		1		1		1
27	Carlos Omar		1		1		1		1		1		1		1		1	1		1		1	
28	Blanca Rosa Ramirez		1		1		1		1		1		1		1		1		1	1		1	
29	Petrona Zuniga		1		1		1		1		1		1		1		1	1		1		1	
30	Mirna Meraz		1		1		1		1		1		1		1		1	1		1		1	
31	Marina Isabel Amador	1		1			1		1		1		1		1	1		1		1		1	
32	Catalina Martinez		1		1		1		1		1		1		1		1		1	1		1	
33	Marisa Lagos		1		1		1		1		1		1		1		1	1		1		1	
34	Eusebia Vanegas Padilla		1		1		1		1		1		1		1		1	1		1		1	
34	**Sub-Total**	**10**	**24**	**9**	**25**	**7**	**27**	**7**	**27**	**8**	**26**	**6**	**28**	**7**	**27**	**5**	**29**	**21**	**13**	**28**	**6**	**27**	**7**

NO.	LOCATION/NAME	Q1		Q2														COLLECTION SERVICE					
				a		b		c		d		e		f		g		P3		P4		P5	
		YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA SAN MARTIN																						
1	Florinda Jimenez		1		1		1		1		1		1		1		1	1		1		1	
2	Lorena Marisol Avila		1		1		1		1		1		1		1		1	1		1		1	
3	Emmy Carolina Godoy		1		1		1		1		1		1		1		1	1		1		1	
4	Maria Margarita Varela		1		1		1		1		1		1		1		1	1		1		1	
5	Mirna Suyapa Amador	1		1			1		1		1		1		1		1		1	1		1	
6	Ana Rosinda Ramos		1		1		1		1		1		1		1		1		1	1		1	
7	Sonia Maribel Valladares		1		1		1		1		1		1		1		1		1	1		1	
8	Maria Elena Hernandez	1		1			1		1		1		1		1		1	1		1		1	
9	Linda Haidee Hernandez		1		1		1		1		1		1		1		1	1		1		1	
10	Jorge Jose Molina		1		1		1		1		1		1		1		1	1		1		1	
11	Xiomara Andino		1		1		1		1		1		1		1		1	1		1		1	
12	Rubenia Martinez		1		1		1		1		1		1		1		1	1		1		1	
13	Jose Alvarado		1		1		1		1		1		1		1		1	1		1		1	
14	Dunia Miranda	1		1			1		1		1		1		1		1	1		1		1	
15	Francisca Diaz		1		1		1		1		1		1		1		1		1	1		1	
16	Francisca Marina Cardozo		1		1		1		1		1		1		1		1	1		1		1	
17	Maria Isabel Quiroz		1		1		1		1		1		1		1		1	1		1		1	
18	Misela Salgado		1		1		1		1		1		1		1		1	1		1		1	
19	Adriana Zuniga		1		1		1		1		1		1		1		1	1		1		1	
20	Maria Dolores Florez		1		1		1		1		1		1		1		1	1		1		1	
21	Pastora Posadas		1		1		1		1		1		1		1		1	1		1		1	
22	Ada Valladeres Diaz		1		1		1		1		1		1		1		1		1	1		1	
23	Maria Elena Sierra	1		1			1		1		1		1		1		1	1		1		1	
24	Ernestina Canales		1		1		1		1		1		1		1		1	1			1	1	
25	Adelina Espinoza		1		1		1		1		1		1		1		1	1		1		1	
26	Linda Zuniga		1		1		1		1		1		1		1		1	1		1		1	
27	Elsa Maria Zuniga		1		1		1		1		1		1		1		1		1	1		1	
28	Carmen Martinez		1		1		1		1		1		1		1		1		1	1		1	
29	Elbia Rosa Osorto		1		1		1		1		1		1		1		1	1		1		1	
30	Margarita Nunez		1		1		1		1		1		1		1		1	1		1		1	
31	Maria J. Caceres		1		1		1		1		1		1		1		1	1		1		1	
32	Wendy Moncada		1		1		1		1		1		1		1		1	1		1		1	
33	Maria A. Romero		1		1		1		1		1		1		1		1	1		1		1	
33	Sub-Total	4	29	4	29	0	33	0	33	0	33	0	33	0	33	0	33	26	7	32	1	33	0
100	Total	21	79	16	84	8	92	7	93	9	91	8	92	7	93	5	95	62	38	88	12	88	12
%	Percentage	21	79	16	84	8	92	7	93	9	91	8	92	7	93	5	95	62	38	88	12	88	12

Table A-1(b) Questionnaire on Collection Service and Campaign for Raising Awareness on Solid Waste Issues

NO.	LOCATION/NAME	COLLECTION SERVICE								CAMPAIGN FOR RAISING AWARENESS ON SW ISSUES											
		Q6		Q7		Q8		Q9		a		b		c		d		e		f	
		a	b	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA TRES DE MAYO																				
1	Elbia Rosa Reyes	1	0		1		1		1	1		1		1			1	1		1	
2	Santos Julio Rubio	0	0	1			1		1	1		1		1		1		1		1	
3	Isabel Ochoa	1	0		1		1		1	1			1	1			1	1		1	
4	Carmen Delia V.	0	0	1		0	1	1		1		1		1		1		1		1	
5	Maria Giron	1	0	1		1		1		1		1		1		1		1		1	
6	Orlando Vargas	1	0	1		1		1		1		1		1		1		1		1	
7	Glenda Suyapa Flores	0	0	1		1		1		1		1		1		1		1		1	
8	Anselmo Sierra	1	0	1		1		1		1		1		1		1		1		1	
9	Ramona Amador	1	0	1		1		0	1	1		1		1		1		1		1	
10	Maira Flores	0	0	1		1		0	1	1		1		1		1		1		1	
11	Guillermo Flores	1	0	1		1			1	1		1		1		1		1		1	
12	Martha Isabel Cruz	1	0	1		1			1	1		1		1		1		1		1	
13	E. Hernandez	1	0	1			1		1	1		1		1		1		1		1	
14	Maria de los Angeles	1	0	1			1		1	1		1		1		1		1		1	
15	Juan de la Cruz	0	0	1		1		1		1		1		1		1		1		1	
16	Reina Valladares	0	0	1		1		1		1		1		1		1		1		1	
17	Odilia Moreira de Sosa	0	0	1		1		1		1			1	1		1		1		1	
18	Juana Hernandez	0	0	1		1		1		1			1	1		1		1		1	
19	Waleska Ponce	0	0	1		1		1		1		1		1		1		1		1	
20	D. Jesseth Palma	0	0	1		1		1		1			1	1		1		1		1	
21	Rosa Maribel Andino	0	0	1		1		1		1			1	1		1		1		1	
22	Celina Gomez	1	0	1		1		1		1		1		1		1		1		1	
23	Teresa Moran	1	0	1		1		1		1			1	1		1		1		1	
24	Esemilda Barrilla	1	0	1		1		1		1			1	1		1		1		1	
25	Eliset Mendoza	0	1	1		1		1		1			1		1	1		1		1	
26	Maria Antonia Garcia	1	0	0	1	1		1			1	1		1		1		1		1	
27	Teresa Sanchez	0	0	1		1		1		1		1		1		1		1		1	
28	Cesar Eugenio Torres	1	0	1		1		1		1		1		1		1		1		1	
29	Petronila Medina	1	0	1		1		1		1		1		1		1		1		1	
30	Celina Romero	1	0	1		1		1		1		1		1		1		1		1	
31	Keidi Ramirez	1	0	1		1		1		1		1		1		1		1		1	
32	Maria Martinez	0	0	1		0	1	0	1	1			1	1		1		1		1	
33	Gladis Boquedano	0	0	1		0	1	0	1	1			1	1		1		1		1	
33	**Sub-Total**	**18**	**1**	**30**	**3**	**25**	**8**	**22**	**11**	**32**	**1**	**23**	**10**	**32**	**1**	**31**	**2**	**33**	**0**	**33**	**0**

NO.	LOCATION/NAME	COLLECTION SERVICE								CAMPAIGN FOR RAISING AWARENESS ON SW ISSUES											
		Q6		Q7		Q8		Q9		a		b		c		d		e		f	
		a	b	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA AYESTAS																				
1	Eugenia Ferrera	1	0	1		1		1		1		1		1		1		1		1	
2	Oscar M. Diaz	0	0	1		1		1		1		1			1		1	1		1	
3	Miriam Pacheco	1	0	1			1		1	1		1			1	1		1		1	
4	Esteban Pavon	0	0		1		1		1		1		1	1		1			1	1	
5	Ventura Avila Lopez	0	1		1	1			1	1		1			1		1		1	1	
6	Rosa Emilia Marin	1	0		1	1		1		1		1			1	1		1		1	
7	Jose H. Villalta	1	0	0	1	1		1		1		1		1		1		1		1	
8	Ramona Rivera	0	1	1		1		1		1		1		1		1			1	1	
9	Modesta	0	0	1		1		1		1		1		1			1		1	1	
10	Jose F. Martinez	1	0	1		1		1		1			1		1	1		1		1	
11	Alicia V. Lozano	0	0	1		1		1		1		1		1		1		1		1	
12	Lizette Arias Sanchez	1	0	1		1		1		1		1		1		1		1		1	
13	Vilma Padilla Moncada	0	0	1		1		1		1			1		1	1		1		1	
14	Emma Rubenia Giron	0	0	1		1		1		1			1	1		1		1		1	
15	Doris Suyapa Cruz	1	0	1		1		1		1		1		1		1		1		1	
16	Maria Elena Garcia	1	0	1		1		1		1			1	1		1		1		1	
17	F. Francisca Martinez	0	0		1	1			1	1			1	1		1		1		1	
18	Jose Ramon Duron	0	0	1		1		1		1		1		1		1		1		1	
19	Luis Fernando Sanchez	0	0	1		1		1		1		1		1		1		1		1	
20	Henry Giron Trinidad	0	0	1		1		1		1		1		1		1		1		1	
21	Delsy Bustillo	0	0	1		1		1		1		1		1		1		1		1	
22	Lesly Suyapa Rivera	0	0	1		1		1		1		1		1			1	1		1	
23	Florentina	1	1		1	1		1		1			1	1		1		1		1	
24	Maria Antonia Cortes	0	0	1		1		1		1		1		1		1		1		1	
25	Marco Antonio C.	0	1		1		1	1		1		1		1		1		1		1	
26	Maria Eugenia Amador	1	0	1		0	1	1		1			1	1		1		1		1	
27	Carlos Omar	0	0	1		1		1		1			1	1		1		1		1	
28	Blanca Rosa Ramirez	1	0	1		1		1		1		1		1		1		1		1	
29	Petrona Zuniga	0	0	1		1		1		1			1	1			1	1		1	
30	Mirna Meraz	0	0	1		1		1		1		1		1		1		1		1	
31	Marina Isabel Amador	0	1	1		1		1		1		1		1		1		1		1	
32	Catalina Martinez	0	0	1		1		1		1		1		1		1		1		1	
33	Marisa Lagos	0	0	1		1		1		1			1	1			1	1		1	
34	Eusebia Vanegas Padilla	0	0	1		1		1		1		1		1		1		1		1	
34	Sub-Total	11	5	27	7	30	4	30	4	33	1	23	11	28	6	28	6	31	3	34	0

NO.	LOCATION/NAME	COLLECTION SERVICE								CAMPAIGN FOR RAISING AWARENESS ON SW ISSUES											
		Q6		Q7		Q8		Q9		a		b		c		d		e		f	
		a	b	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
	COLONIA SAN MARTIN																				
1	Florinda Jimenez	0	0	1		1			1	1		1		1		1		1		1	
2	Lorena Marisol Avila	0	0	1		1		1			1		1	1		1		1		1	
3	Emmy Carolina Godoy	0	0	1		1		1		1		1		1		1		1		1	
4	Maria Margarita Varela	0	0	1		1		1		1		1		1		1		1		1	
5	Mirna Suyapa Amador	0	0	1		1		1		1		1		1		1		1		1	
6	Ana Rosinda Ramos	1	0	1		1		1		1		1			1	1		1		1	
7	Sonia Maribel Valladares	1	0	1		1		1		1			1	1			1	1		1	
8	Maria Elena Hernandez	1	0	1		1		1		1		1		1		1		1		1	
9	Linda Haidee Hernandez	0	0	1		1		1		1		1		1		1		1		1	
10	Jorge Jose Molina	0	0	0	1	0	1	1		1			1	1	0	1		1		1	
11	Xiomara Andino	0	0	1		0	1	0	1	1		1		1		1		1		1	
12	Rubenia Martinez	0	0	1		0	1	1		1		1		1		1		1		1	
13	Jose Alvarado	0	0	1		1		1		1		1		1		1		1		1	
14	Dunia Miranda	0	0	1		1		1		1		1		1		1		1		1	
15	Francisca Diaz	0	0	1		1		1		1		1		1		1		1		1	
16	Francisca Marina Cardozo	1	0	1		1		1		1		1		1		1		1		1	
17	Maria Isabel Quiroz	0	0	1		1		1		1		1		1		1		1		1	
18	Misela Salgado	0	0	1		1		1		1		1		1		1		1		1	
19	Adriana Zuniga	0	0	1		1		1		1		1		1		1		1		1	
20	Maria Dolores Florez	0	0	1		1		1		1		1		1		1		1		1	
21	Pastora Posadas	0	0	1		1		1		1		1		1		1		1		1	
22	Ada Valladeres Diaz	0	0	1		1		1		1		1		1		1		1		1	
23	Maria Elena Sierra	1	0	1		1			1	1		1		1		1		1		1	
24	Ernestina Canales	0	0	1		1			1	1		1		1		1		1		1	
25	Adelina Espinoza	0	0	1		1			1	1		1		1		1		1		1	
26	Linda Zuniga	0	0	1		1		1		1		1		1		1		1		1	
27	Elsa Maria Zuniga	0	0	1	0	1	0	1	0	1		1		1		1		1		1	
28	Carmen Martinez	1	0	1		1		1		1		1		1		1		1		1	
29	Elbia Rosa Osorto	0	1	1		1		1		1		1		1		1		1		1	
30	Margarita Nunez	0	0	1		1		1		1		1		1		1		1		1	
31	Maria J. Caceres	0	0	1	0	1	0	1	0	1		1		1		1		1		1	
32	Wendy Moncada	0	0	1		1		1			1		1	1		1		1		1	
33	Maria A. Romero	0	0	1	0	1	0	1	0	1		1		1		1		1		1	
33	Sub-Total	6	1	32	1	30	3	28	5	31	2	29	4	32	1	32	1	33	0	33	0
100	Total	35	7	89	11	85	15	80	20	96	4	75	25	92	8	91	9	97	3	100	0
%	Percetage	35	7	89	11	85	15	80	20	96	4	75	25	92	8	91	9	97	3	100	0

14.4 Experiment on the Improvement of the Existing Final Disposal Site

14.4.1 Objective

The experiment aims to demonstrate sanitary landfill operation methods and to examine the applicability of the system proposed in the master plane. The experiment consists of part improvement of final disposal site facilities, on-the-job training of the landfill staff, and the trial management of the scavengers.

Training in correct methods rather than design has the greatest influence in improving landfill operation. Nonetheless, during training the selected engineer in charge of the landfill was also given notes regarding appropriate design.

14.4.2 Background

As a result of the poor existing infrastructure and the manner the sanitary landfill operates, a number of sanitary and environmental problems have been produced (problems are discussed in greater detail in Chapter 15):

- The propagation (by humans, insects, and animals) of pathogenic microorganisms that can proliferate in final disposal sites
- Aesthetic deterioration of the site due to scattering of paper, plastic, and other light objects by the wind
- Constant emission of smoke and bad odors emanating from uncovered waste on the slopes of landfilling, and taken many kilometers by the wind
- Leachate and biogas generation are environmental problems maybe less conspicuous, but have great importance because they can cause serious alterations to the environment

The main problems identified above have their origin in few actions and situations which take place inside the disposal site, i.e., waste left uncovered, intentional burning of waste, generation of leachate, and landfill gas not burned nor utilized.

If the waste is compacted and covered in a timely manner, the number of humans and animals on site will fall, in addition to reducing uncontrolled waste burning. Furthermore, it prevents greatly a large amount of paper, plastics, and other light waste that is scattered by the wind and transported outside the disposal site.

Regarding leachate infiltration into the ground, nothing can be done about the existing situation; however, over time the biodegradation of the waste and the overburden pressure results in the permeability lower layers attenuating groundwater contamination. Leachate generation will be somewhat reduced due to new cell filling methods and leachate moving on the surface is controlled by constructing small retaining walls in such a way as to contain as much leachate as possible within the

landfill. Placing vertical gas vents, which redirect biogas in order to utilize it as an energy resource or simply flaring it, can control landfill gas.

Improving the condition of internal roads can mitigate dust and the centers for extraction and collection of cover material.

With few measures, many of the existing problems can be solved, but these measures should be applied carefully so as to prevent other problems arising, especially those involving social issues. Consequently some changes should be done immediately, for instance, those related with facilities; on the other hand, others should be developed step by step specially those which involve participation from persons not directly linked to the works, but whose livelihoods depend upon it.

14.4.3 Pilot Projects Components

A series of measures and activities were planned with the objective of attaining the objectives defined for the pilot project:

1) To select a professional who has the responsibility of undertaking the work program of the sanitary landfill. This professional should have capability to lead and to understand the solutions outlined; he/she will receive the most attention during the training process and execution of works. And to initiate sanitary landfilling techniques. Through training the selected professional in the 'cell' method of landfilling, installing landfill gas vents, and controlling surface water and leachate.

2) To install basic facilities necessary for maintaining control over the sanitary landfill and improving the appearance of the overall site. The control of the site is enhanced if everyone (landfill staff and scavengers) can respect and recognize the importance of the works. Improving the appearance of the site conveys to officials, landfill staff, scavengers, and local residents the advantages of a clean landfill site, and therefore motivates continued actions to improve the site.

3) To develop and to undertake a program which allows scavengers to continue working within the site. Because it is believed that the forced removal of scavengers from the site is unrealistic. The program should be done with the participation of personnel from the Social Development Manager's Office of the AMDC.

4) To seek an integrated solution that solves existing problems while not creating new ones. Scavengers should not lose their livelihood; they are doing works that are positive for the economy of Honduras, recycling and reuse saves hard currency, energy, and non-renewable resources, etc. However, they should not be carriers of parasites and microorganisms that cause diseases. Washing themselves and changing clothes would help. Also the activity of scavenging should be given dignity and social support with the eventual aim of becoming a normal job.

5) To prohibit the access of persons who bring domestic animals into the site for the purpose of letting them feed on disposed waste.

6) To prohibit access to children.

7) To undertake a work program that includes technical aspects that are necessary to provide solutions to existing problems; these solutions should be compatible with the presence of scavengers.

14.4.4 Execution and Results of the Pilot Project

a. Activity 1: On-the-Job Training of AMDC Staff

The Cleansing Department fulfilled Activity 1 by appointing Marlon Aguilera a civil engineer. He met the profile of the required professional, having leadership capabilities and the ability to understand the solutions explained to him.

He was contracted a few days after the pilot project was initiated in July, and was present during the entire implementation.

The training of the engineer included:

- On-site preparatory explanation of all facilities to be constructed and the filling methods to be employed were given to the engineer.
- The pilot sanitary landfill site was selected and preparing the site began
- Instructions were provided on landfilling techniques such as the cell method of landfilling, the control of leachate, landfill gas, and light waste which can be scattered by the wind
- Instructions were provided regarding the extraction, use, and storage of cover material
- Instructions on measures to make the sanitary landfill operation compatible with the presence of scavengers

As a result of training the engineer and initiating the new landfilling procedures, the bulldozer operators, dump truck drivers, and other landfill staff learnt important new procedures necessary for establishing a sanitary landfill. Scavengers were also introduced to the new procedures.

b. Activity 2: Installation and Demonstration of Essential Sanitary Landfill Facilities

The construction of facilities and works that are executed with the objective of achieving control over the disposal site. Vital to this activity's success is scavenger recognition of the fact that the works are important and will also benefit them in the long run:

- Asphalt paving of the main access road (300 meters) serves as a dust control measure, as well as drastically improves the appearance of the landfill site and traffic movements.

- Erection of a mesh and barbed wire perimeter fence (approx. 250 meters), concrete block wall, gate and gatehouse, and the placement of a signboard explaining conditions of entry at the entrance. In this way, access to the final disposal site is controlled and hence the scheduling of activities within the site can be made.
- Installation of a plastic mesh fence three meters high to prevent paper, plastic, and other light waste from being scattered by the wind toward residential and business areas located near the landfill. The mesh extends approximately 200 meters and consists of a fine mesh and lateral barriers to trap the light wastes.
- Construction of moveable screens to control light waste near the work face.
- Construction and installation of landfill gas vents in the pilot sanitary landfill sector.
- Forestation of area where erosion has taken place nearby the final disposal site with the objective of creating continuous vegetation screen (buffer zone).
- Planting grass in an experimental manner in a small sector of the sanitary landfill.
- Overall cleansing of the site was undertaken. This included picking up loose litter and covering and grading exposed areas with soil.
- Topographical study with the objective of getting basic information to define spatial use, to determine site service life and to develop work programs.
- Geological study and soil analysis in order to determine the amount of available cover material for the sanitary landfill which can be obtained at the site and to define the physical and mechanical properties of the material.
- Installation of a sign informing open hours, conditions of entry, and the fact that the site belongs to the AMDC.
- Also cones and signs to direct the traffic of vehicles, and fire extinguishers were provided. Fumigation of 5 hectares was undertaken at the final disposal site in order to control the proliferation of insects.

c. Activity 3: Trial Management of Scavengers

The organizing of scavengers so their work does not interfere with the operation of the sanitary landfill.

To implement sanitary landfilling is necessary that the chief engineer have complete control of the facility. Therefore all those working at the disposal site must cooperate with his commands.

Scavengers' current working habits are chaotic; it is difficult to get them to respond to requests for cooperation. Scavengers work wherever, however, and whenever they please. And middlemen behave in a similar way.

The methodology used to organize scavengers:

- Necessary demographic data and the their opinions were obtained through an interview survey.
- Leaders were identified.
- Talks were held with the chosen leaders to gain their confidence and to communicate to them what has been planned, and their reactions observed.
- The AMDC Section of Social Participation and Organization, Micro-Enterprises and Areas with Populations at Risk were included in the process.
- Group meetings were held with scavengers at the final disposal site.
- A preliminary registration of scavengers was done (recording name, age, and sex).
- Registration, printing, and issuing of ID card.
- Vaccinating scavengers for Tetanus and Hepatitis B took place.
- Leaders were officially recognized and introduced to other scavengers as such. Scavengers were then organized into a group.
- Scavengers were presented with items, such as caps and T-shirts to signify their identity as part of a group.
- Works that supported the creation of the micro-enterprise for scavengers were initiated.

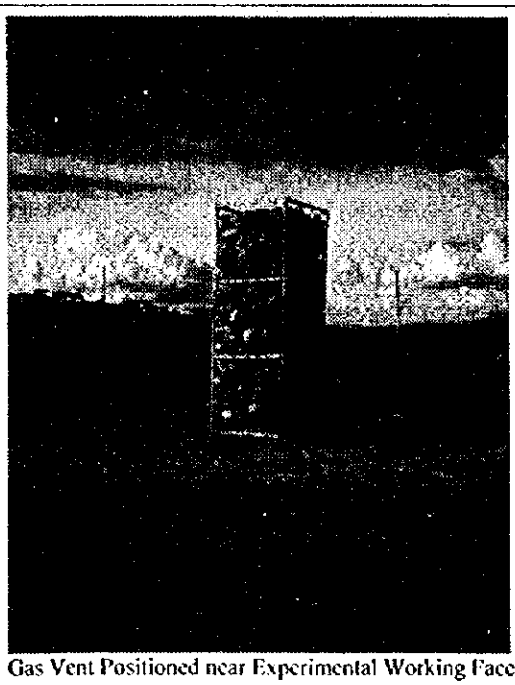
In addition to what was previously stated, conditions of entry into the sanitary landfill will be set and a proposal for a regulation for scavengers is provided:

Table 14-10: Conditions of Entry into AMDC Disposal Site

1	The *Alcaldía Municipal del Distrito Central* (AMDC) reserves the right to admit or reject any person into the sanitary landfill.
2	Waste disposal is allowed only at the days and hours established. From Monday to Friday: 7:00 am to 6:00 pm Saturday: 7:00 am to 2:00 pm
3	Only those persons displaying a valid AMDC issued entrance card may enter the landfill site. Any other person wishing to enter the site should be approved by the chief engineer.
4	The AMDC reserves the right to inspect any load leaving or entering the site.
5	Waste disposal will be done in the area indicated by authorized personnel from municipality at the moment to go into the facility.

Table 14-11: Proposed Scavenger Regulations

1	Entrance to the landfill site is permitted between 7:00am and 4:00pm. At 6:00pm all scavengers should evacuate the site.
2	Only scavengers displaying a valid AMDC issued entrance card may enter the landfill site
3	The decision to allow anyone to enter lies ultimately with the chief engineer
4	Scavenging activities are only permitted in areas designated for such work.
5	Scavengers are strictly prohibited from climbing onto the back of vehicles entering the site
6	The chief engineer has the authority to eject any scavenger from the site that in his opinion is being disruptive to general operations. The ejected scavenger will only be allowed back onto the site following the permission of the chief engineer.
7	No alcohol or drugs shall be allowed into the landfill site. Anyone who, in the opinion of the site manager, is under the influence of alcohol or drugs will not be permitted on to the site.
8	Persons under the age of 18 years old are prohibited from entering the site. Students under the supervision of a teacher or other responsible adult may enter the site.
9	Scavengers must maintain areas used to temporarily hold recovered materials in a tidy manner. Landfill staff may request scavengers to clean areas adjacent to holding areas.
10	A maximum of 130 scavengers will be allowed to hold entrance cards.
11	No animals shall be allowed to enter the disposal site
12	Severe or repeated violations will result in the cancellation of the AMDC entrance card.



Gas Vent Positioned near Experimental Working Face

14.4.5 Evaluation of Pilot Project

Implementation of activities 1, and 2 were very successful. Engineer (Marlon Aguilera) quickly grasped all of the concepts that were explained to him, and attained the respect of fellow landfill staff and scavengers. His ability to manage, however, is greatly hindered by poor facilities, i.e., not having a vehicle or telephone to communicate with the Cleansing Department headquarters in *Colonia de 21 de Octobre*. A vehicle is necessary to quickly move about the site and to obtain necessary materials from the city.

Equipment operators are skilled and after only a few days of instruction and trials, sanitary landfilling methods were being carried out smoothly and in a professional manner.

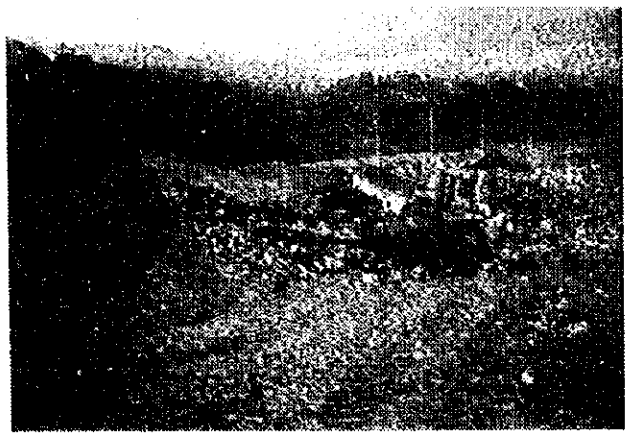
The installation of basic facilities was done without problems and all were operating as planned at the end of the pilot project stage.

Activity 3 to 7 were set in place. Scavengers cooperated and understood that the changes being made were also in their interests.

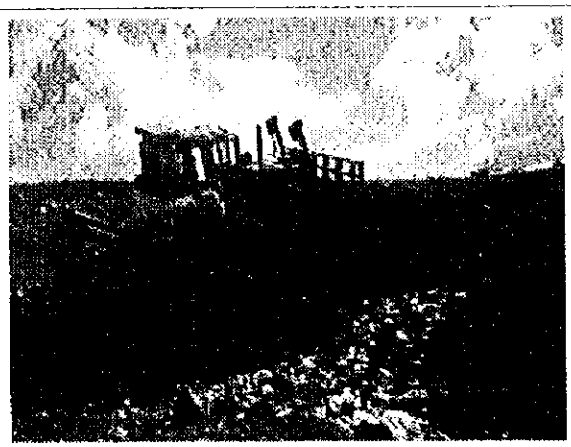
Even though every one was made clearly aware of the importance of sanitary landfilling methods and understood how to implement them. Once the experiment was over and the study team left, sanitary landfilling immediately ceased and the landfill staff reverted back to the previous landfilling methods. Because of institutional problems the AMDC administration is not supplying a sufficient amount of fuel for the bulldozers to continue applying the methods learnt.

Scavenging activities are again not being controlled. Frequent change is discouraging and confusing to them. Because constant supervision and assistance is necessary for the scavengers to gain confidence in the newly introduced methods.

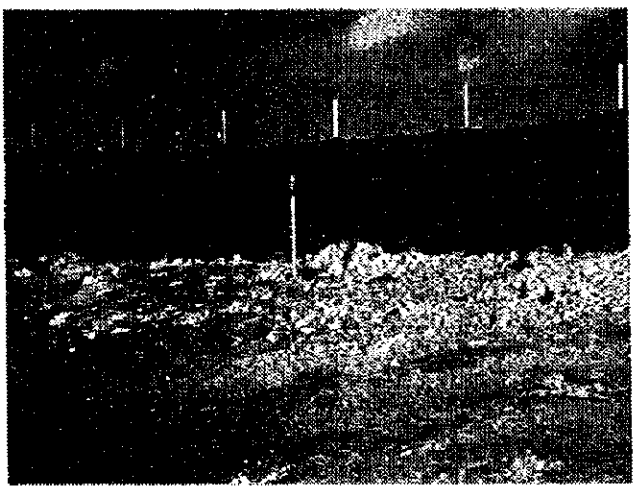
Even though the condition of the disposal site markedly improved through the implementation of this experiment, sustained improvement is vital. And sustained improvement can only occur with institutional reform thus ensuring the provision of spare parts and fuel, the coordinating the use of landfill equipment, support for the proper management of the site and scavengers, and planning of future disposal activities.



Compaction of Waste in Layers



Application of Cover Soil



Permanent Waste Fence

Paving of Access Road

Vaccination of Scavengers

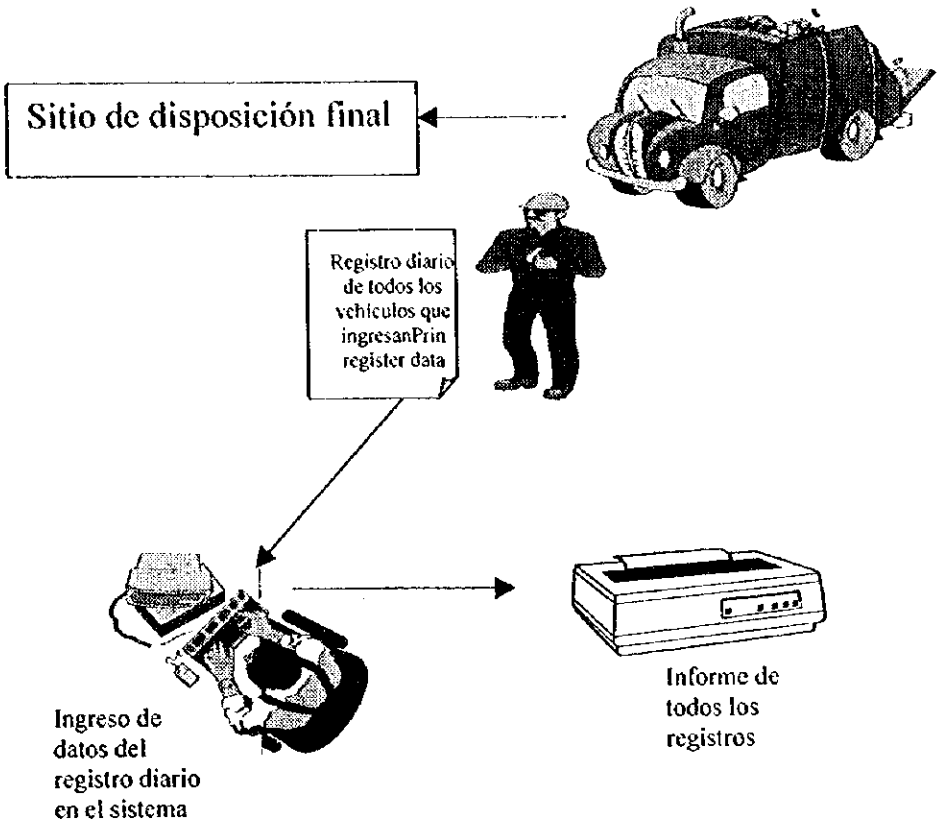
14.5 Improvement of the Managerial Capability of the Cleansing Section

This pilot project focuses mainly on the improvement of record keeping, cost control, and cost analysis systems by using computers. It also includes training staff on management methods by using computers.

Manual de Usuario

Sistema de Control de AMDC

I. Especificaciones del sistema



En la entrada del sitio de disposición final el encargado, registra todos los vehículos que ingresan, en la siguiente planilla.

AMDC - Planilla de Control Diario de Vehículos en el Relleno Sanitario

Fecha								
Placa	**Marca**	**Modelo**	**Entrada**	**Salida**	**Peso**	**Clasif.**	**Zona**	**Resp.**
1			:	:				
2			:	:				
3			:	:				
4			:	:				

1. Se registra el numero de placa o el número de unidad que se utiliza, como identificador del vehículo.
2. La marca del vehículo.
3. El modelo del vehículo.
4. La hora de entrada.

5. La hora de salida.
6. Como en el sitio de disposición final no se cuenta con una bascula, los pesos se estiman de acuerdo la siguiente tabla:

Tipo de vehículo	Toneladas promediadas según el estudio
Fiat (Compactador 13m3)	5.7
Fiat (Volqueta 8m3)	2.9
Hino (Compactador 15m3)	6.4
Nissan (Volqueta 12m3)	3.9
Hino (Volqueta 8m3)	5.3
Mercedez Benz (Volqueta 8m3)	3.2
Hino (Contenedor 12m3)	2.8
Hino (Contenedor 5.5m3)	1.3
Vehículos privados (pequeños)	0.3
Vehículos privados (medianos)	0.7
Vehículos privados (grandes)	1.5

7. Se registran la clasificación del residuo según la siguiente tabla:

Tabla de Clasificación de Residuos

Cod.	Tipo	Cód.	Categoría		Residuo
A	Residuos	A1	Residencial	A101	Area Residencial
		A2		A201	Barrido de calles
				A202	Mercados
				A203	Hoteles y Restaurantes
				A204	Construcción
				A205	
				A206	
				A207	
		A3	Industriales	A301	Contaminantes
				A302	No-contaminantes
		A4	Otros	A401	
B	Tierra	B1	Tierra p/cobertura	B101	Tierra

8. La zona de donde provienen los residuos.
9. Se registra el responsable, quién trae el residuo.

Al final del de la jornada, la planilla se lleva en la oficina central en donde se ingresan todos los registros en la computadora, para su posterior análisis e informe.

Este sistema de control es desarrollado con los siguientes objetivos:

- Para crear una base de datos de todos los vehículos ingresados en el sitio de disposición final.
- Para conocer la cantidad de residuos depositados en el sitio de disposición final.
- Para obtener un análisis, la cual será de gran utilidad en la planificación futura del manejo de residuos sólidos.

II. Sistema

A. Para empezar

- Ejecute el icono AMDC, y luego aparecerá la siguiente pantalla

ESTUDIO SOBRE MANEJO DE RESIDUOS SOLIDOS
DEL AREA URBANA DE TEGUCIGALPA
DISTRITO CENTRAL DE HONDURAS

EARTHEON

Kokusai Kogyo., LTD.

JICA

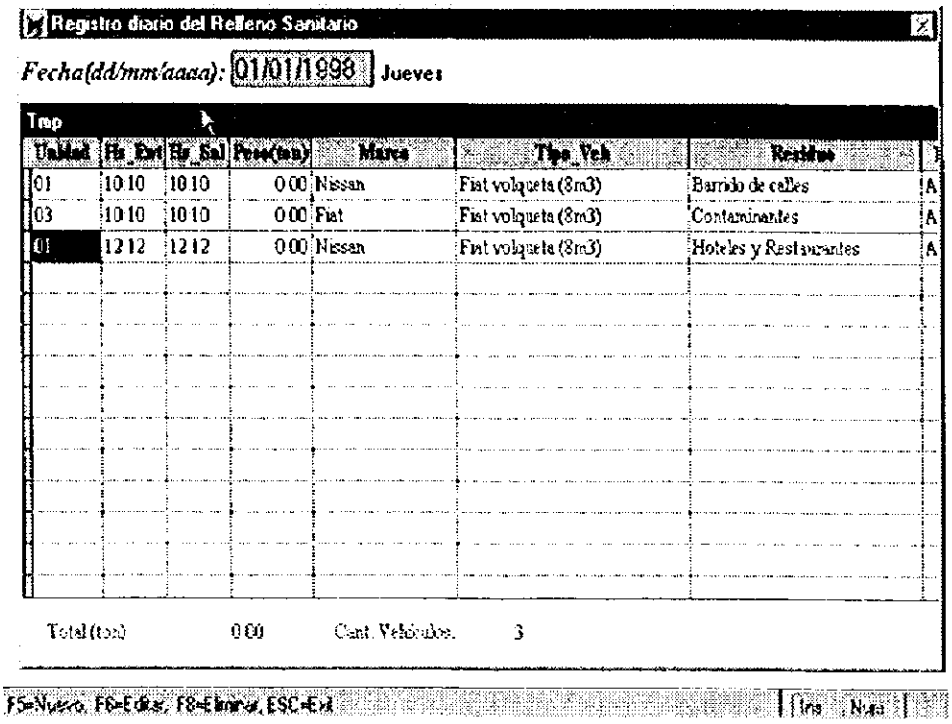
B. *Menú Principal*

Este es el menú principal del sistema, que tienen las diferentes opciones que se detallan a continuación

C. *Registros*

1. Para registrar los datos diarios.

Dentro del opción Registros, seleccione Diarios y aparecerá la siguiente pantalla.

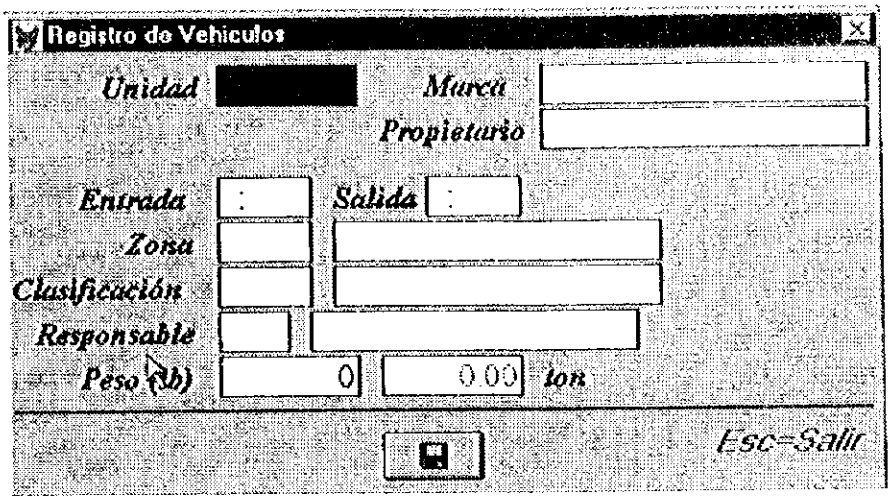


a) Para registrar los datos

Ingrese la fecha del registro, si la fecha de registro es nueva no aparecerá ningún datos, sino aparecerán los datos registrado de esa fecha.

b) Agregar un nuevo registro

Para agregar un nuevo registro presione **F5** y aparecerá la siguiente pantalla.



1. Ingrese la el código de la unidad, si el vehículo está registrado, aparecerán los datos correspondiente a esa unidad. Si el vehículo no se encuentra registrado, el sistema le preguntará si desea agregar, verifique bien los datos y luego proceda a confirmar.

> ∀ *Nota:* Cuando se agrega una nueva unidad, luego tendrá que ir al menú de **Vehículos**, para actualizar los datos correspondientes a esa unidad

2. Ingrese la hora de entrada al sitio de disposición fi nal.
3. Ingrese la hora de salida del sitio de disposición fi nal.
4. Ingrese la el código de zona de recolección de los residuos o presione μ, para buscar .
5. Ingrese el código de clasificación de residuo o presione μ, para buscar.
6. Ingrese el código del responsable del vehículo o Presione μ, para buscar.
7. Ingrese el peso de neto del residuo.

> ∀ *Nota:* El peso solamente se ingresará, de los vehículos que se hayan pesado en alguna bascula. Los que no se pesan se dejan en blanco

8. Presione el botón aceptar.

c) Modificar un registro existente

Para modificar un registro existente, con el cursor elija el registro y luego presione φ y aparecerá una pantalla similar a la de agregar un registro.

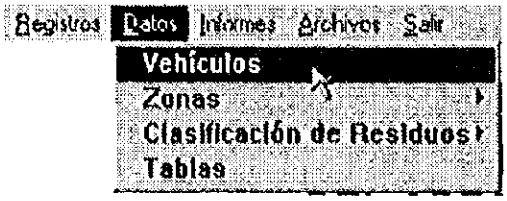
1. Seleccione los datos a modificar y realice las modificaciones correspondientes.
2. Luego de modificar, seleccione el botón aceptar y presione ρ.

d) Eliminar un registro

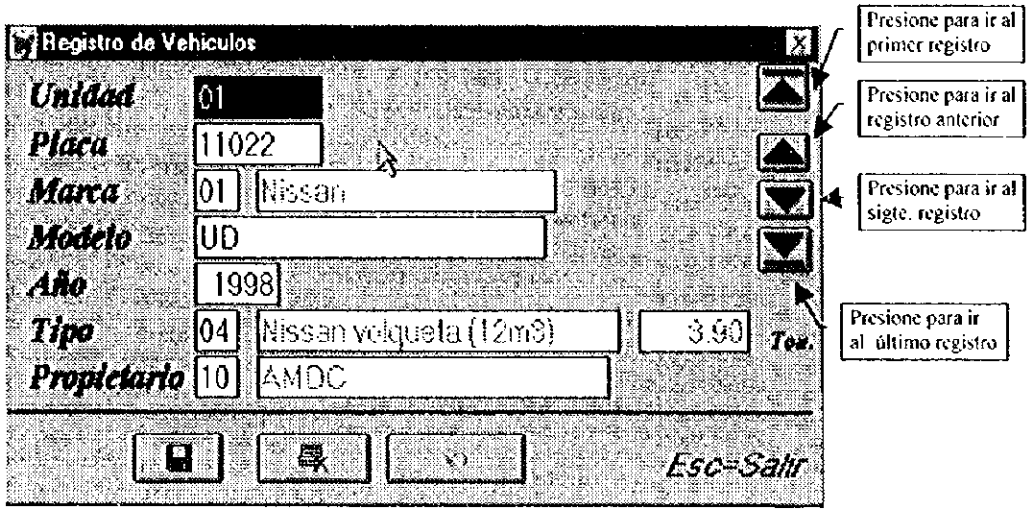
Para eliminar un registro existente, con el cursor elija el registro, verifique bien y asegúrese de que es el registro que desea eliminar, y luego presione ν.

D. Datos

1. Vehículos



Dentro de la opción **Datos**, seleccione **Vehículo** y aparecerá la siguiente pantalla.



a) Registro de vehículo nuevo

1. Ingrese código del vehículo nuevo, el sistema verificará si existe y le indicará que es nuevo.
2. Ingrese la placa.
3. Ingrese la marca o presione µ para buscar.
4. Ingrese el modelo que identifique al vehículo.
5. Ingrese el año de fabricación.
6. Ingrese el tipo de vehículo o presione µ buscar.

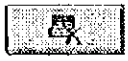
> ∀*Nota:* El tipo de vehículo es imprescindible, porque de acuerdo a esto se calcula el peso de cada vehículo. Verifique que todos los vehículos tengan sus correspondientes tipos, para que todos los informes posteriores sean correctos.

7. Ingrese el código de propietario o responsable del vehículo.
8. Presione el botón guardar, para actualizar los datos del vehículo.

9. Presione el botón cancelar, si desea cancelar y no modificar nada.

b) Eliminar el registro de un vehículo

1. Ingrese código del vehículo que desea eliminar, si es que está registrado aparecerán los datos correspondientes.
2. Seleccione el botón eliminar y presione ρ

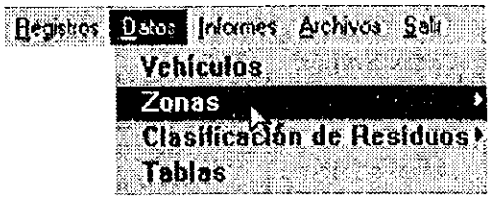


> ∀*Nota:* No se pueden eliminar los vehículos que se encuentran registrado y tienen algún registro de entrada en el sitio de disposición final.

c) Consultas

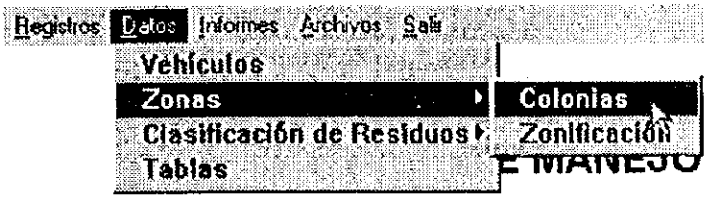
1. Presione los botones de consultas que se encuentran en el lado derecho de la pantalla.

2. *Zonas*



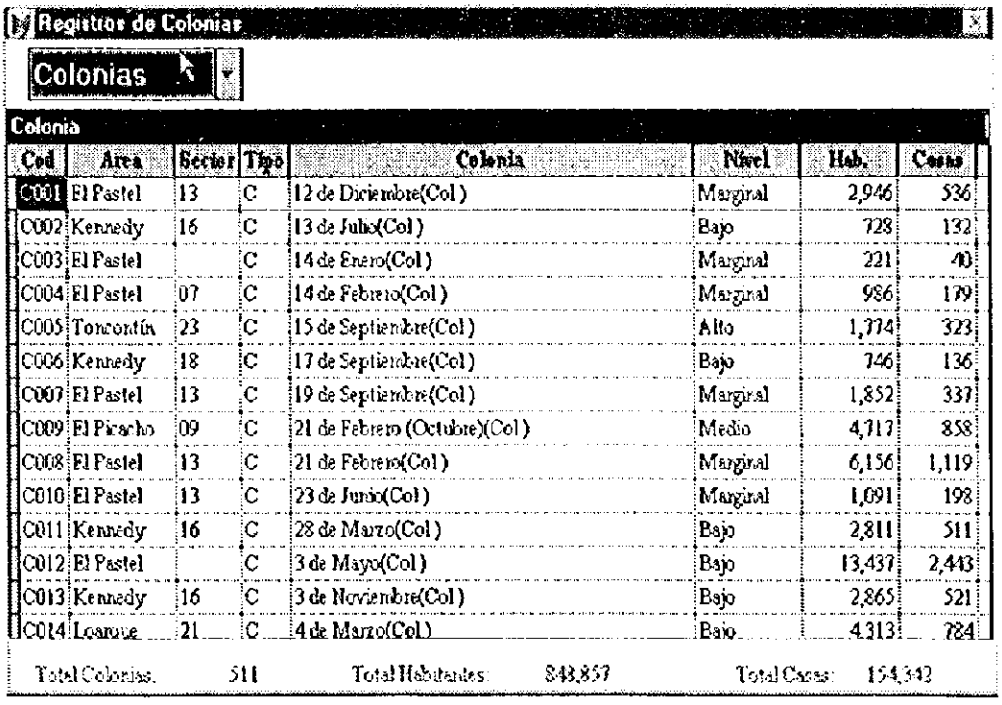
a) Colonias

Dentro de esta opción se definen las colonias y lugares especiales que integran las zonas de recolección.



Dentro de la opción zona elija colonias y aparecerá la siguiente pantalla.

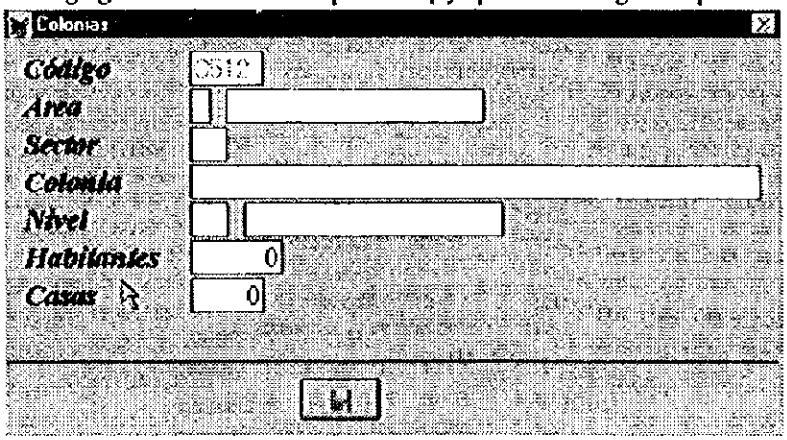
Para definir las colonias , elija la opción Colonias y luego aparecerá la siguiente pantalla.



Cod	Area	Sector	Tipo	Colonia	Nivel	Hab.	Casas
C001	El Pastel	13	C	12 de Diciembre(Col)	Marginal	2,946	536
C002	Kennedy	16	C	13 de Julio(Col)	Bajo	728	132
C003	El Pastel		C	14 de Enero(Col)	Marginal	221	40
C004	El Pastel	07	C	14 de Febrero(Col)	Marginal	986	179
C005	Tonconitín	23	C	15 de Septiembre(Col)	Alto	1,774	323
C006	Kennedy	18	C	17 de Septiembre(Col)	Bajo	746	136
C007	El Pastel	13	C	19 de Septiembre(Col)	Marginal	1,852	337
C009	El Pinacho	09	C	21 de Febrero (Octubre)(Col)	Medio	4,717	858
C008	El Pastel	13	C	21 de Febrero(Col)	Marginal	6,156	1,119
C010	El Pastel	13	C	23 de Junio(Col)	Marginal	1,091	198
C011	Kennedy	16	C	28 de Marzo(Col)	Bajo	2,811	511
C012	El Pastel		C	3 de Mayo(Col)	Bajo	13,437	2,443
C013	Kennedy	16	C	3 de Noviembre(Col)	Bajo	2,865	521
C014	Loarque	21	C	4 de Marzo(Col)	Bajo	4,313	784

Total Colonias: 511 Total Habitantes: 848,857 Total Casas: 154,342

1. Para agregar una nueva colonia presione φ y aparecerá la siguiente pantalla.



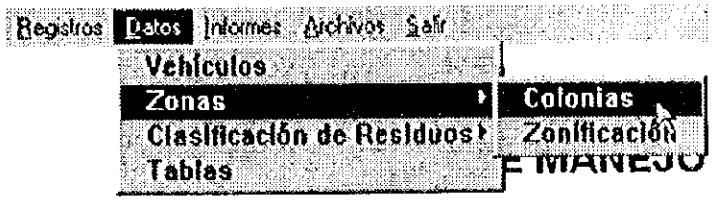
- El código de colonia se generará automaticamente
- Ingrese el código de área, que comprende la colonia o presione μ para buscar.
- Ingrese el sector en que se encuentra la colonia.
- Ingrese el código de nivel de vida de la colonia o presione μ para buscar.
- Ingrese la cantidad de habitantes de la colonia.
- Ingrese la cantidad de casas de la colonia.
- Seleccione el botón guardar y presione ρ

2. Para modificar los datos de las colonias presione κ y aparecerá una pantalla similar al de agregar.
   - Dentro de la pantalla realice todos los cambios correspondientes
   - Seleccione el botón guardar y presione ρ

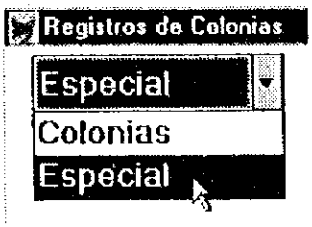
3. Para eliminar los datos de las colonias, seleccione la colonia que desea eliminar y luego presione ν.

b) Zonas Especiales

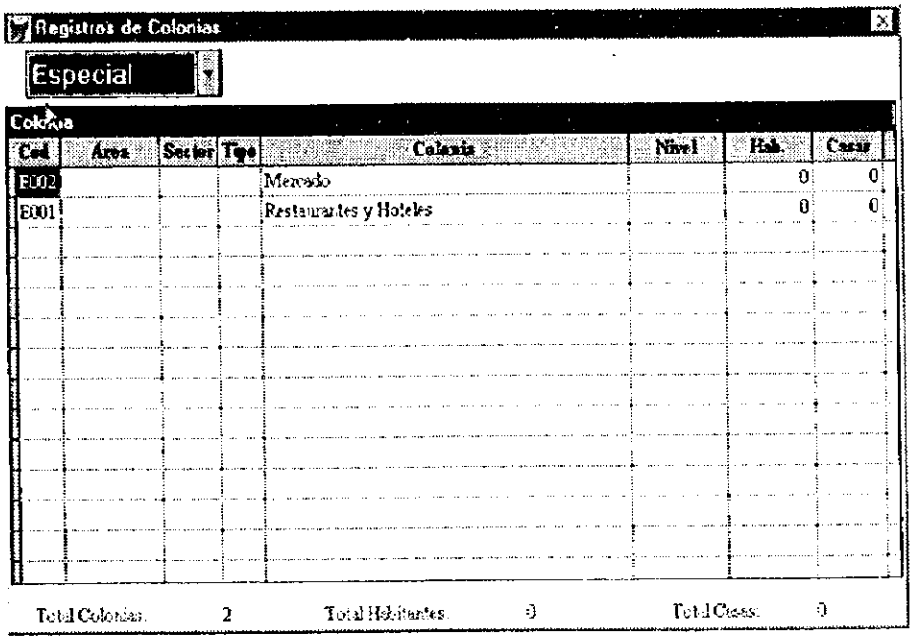
Dentro de esta opción se definen las colonias y lugares especiales que integran las zonas de recolección.



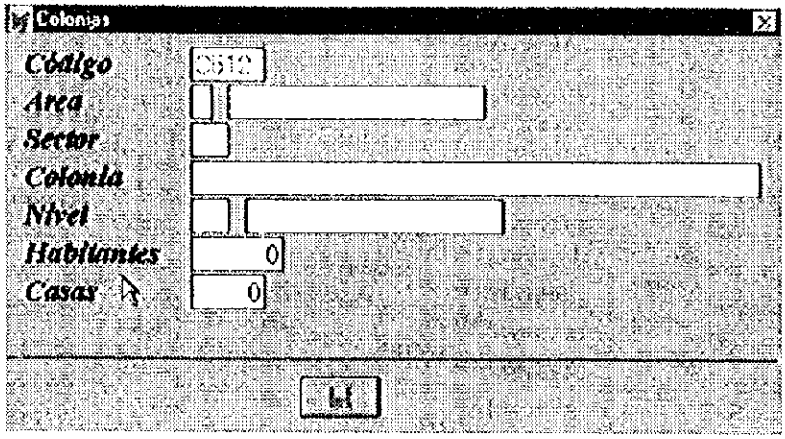
Dentro de la opción zona elija colonias y aparecerá la siguiente pantalla.



Para definir los lugares especiales, elija **Especial** y luego aparecerá la siguiente pantalla.



1. Para agregar un nuevo lugar especial presione φ y aparecerá la siguiente pantalla.



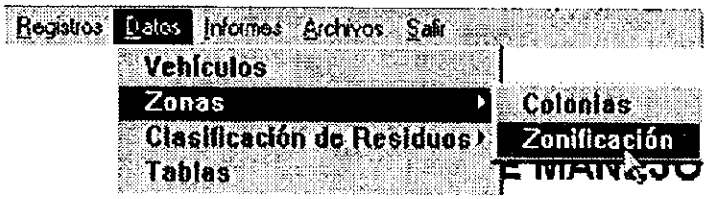
- Los código de los lugares especiales se generará automáticamente
- Ingrese el código de área, que comprende el lugar o presione μ para buscar.
- Ingrese el sector en que se encuentra.
- Ingrese el código de nivel de vida del lugar o presione μ para buscar.
- Ingrese la cantidad de habitantes.
- Ingrese la cantidad de casas.
- Seleccione el botón guardar y presione ρ

2. Para modificar los datos de los lugares especiales presione κ y aparecerá una pantalla similar al de agregar.
   - Dentro de la pantalla realice todos los cambios correspondientes
   - Seleccione el botón guardar y presione ρ

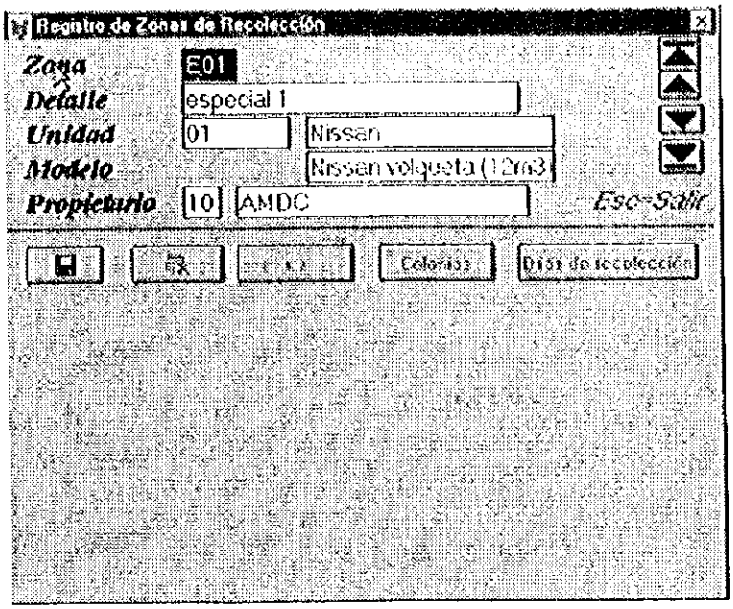
3. Para eliminar los datos de las colonias, seleccione la colonia que desea eliminar y luego presione ν.

c) Zonificación

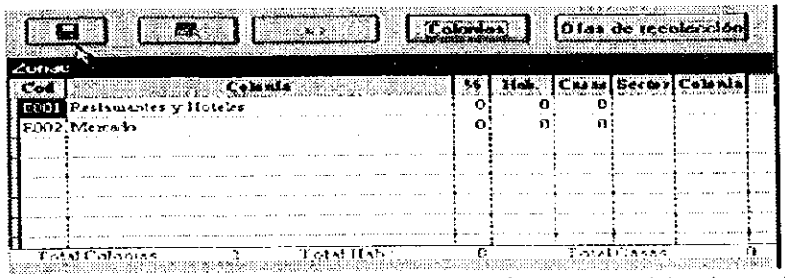
Dentro de esta opción se definen las zona de recolección.



Dentro de la opción zona elija **Zonificación** y aparecerá la siguiente pantalla.

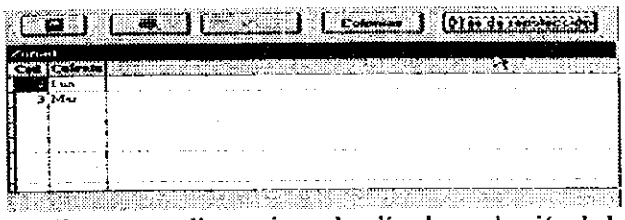


1. Para agregar una nueva zona de recolección, ingrese el código de la zona.
2. Ingrese el detalle de la zona.
3. Ingrese la unidad encargada de recolección.
4. Ingrese el responsable de la recolección de la zona.
5. Seleccione el botón guardar y presione ρ para guardar los datos de la zona.
6. Seleccione el botón colonias y presione ρ y aparecerá la siguiente pantalla.



- En esta pantalla se asignan las colonias y lugares especiales de recolección que comprende la zona definida.
- Para agregar una nueva zona o lugar especial de recolección presione φ, y aparecerá una lista de las zonas o de los lugares especiales de recolección.
- Seleccione uno y presione ρ.
- Ingrese el porcentaje de cobertura de la colonia o del lugar especial de recolección.
- Presione ε para salir.

7. Seleccione el botón días de recolección y aparecerá la siguiente pantalla.



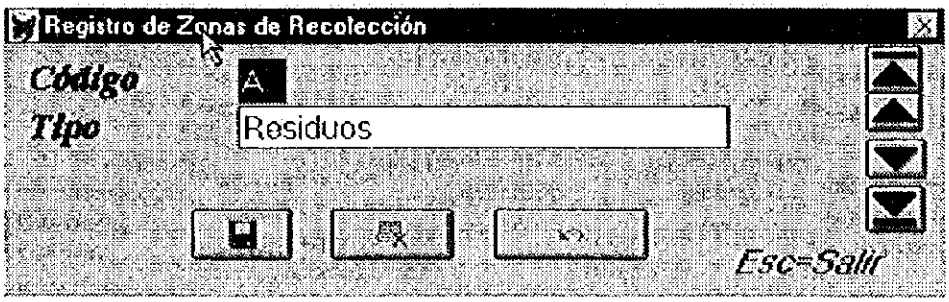
- En esta pantalla se asignan los días de recolección de las distintas zonas.
- Para agregar un nuevo día de recolección presione φ, y aparecerá una lista de los días.
- Seleccione el día correspondiente y presione ρ.

3. Clasificación de residuos

Esta opción le permite definir la tabla de clasificación de residuos. Siga los siguientes pasos

a) Tipos

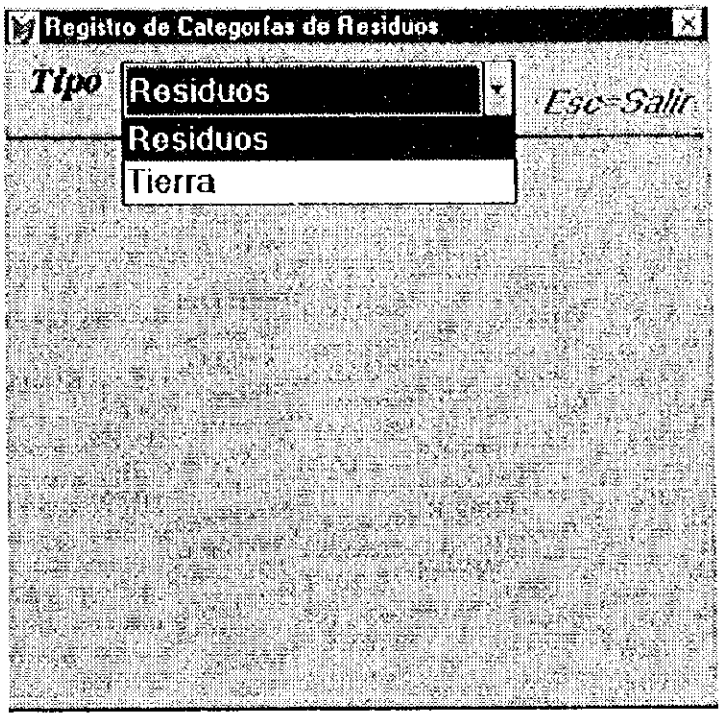
Primeramente defina los tipos, para la cual dentro de la opción **Clasificación de Residuos** , elija la opción **Tipos** y aparecerá la siguiente pantalla.



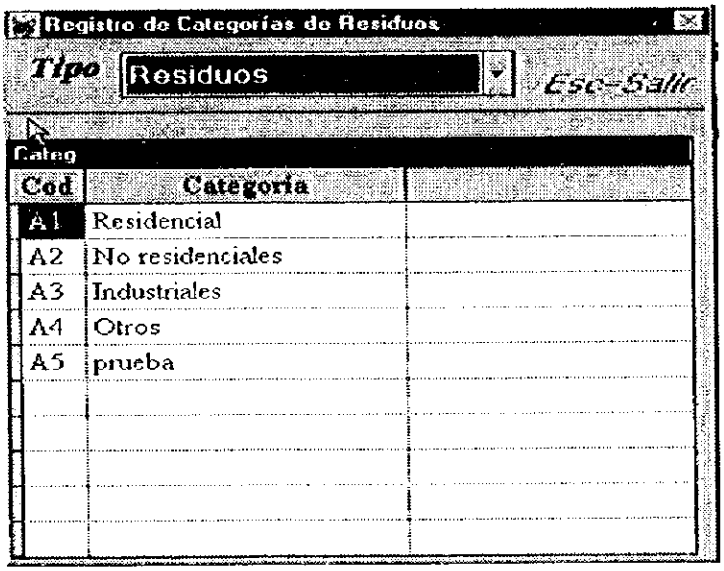
1. Para agregar
   - Ingrese el código de tipo, si el código no existe le aparecerá un mensaje que es nuevo.
   - Ingrese el detalle del tipo.
   - Seleccione el botón guardar y presione ρ para actualizar los datos o seleccione el botón cancelar, para cancelar.
2. Para eliminar
   - Ingrese el código de tipo, que desea eliminar, si el código existe le aparecerá los detalles del tipo.
   - Seleccione el botón eliminar y presione ρ.
3. Para consultas
   - Elija los botones de consulta que aparecen en la parte derecha de la pantalla.

b) Categorías

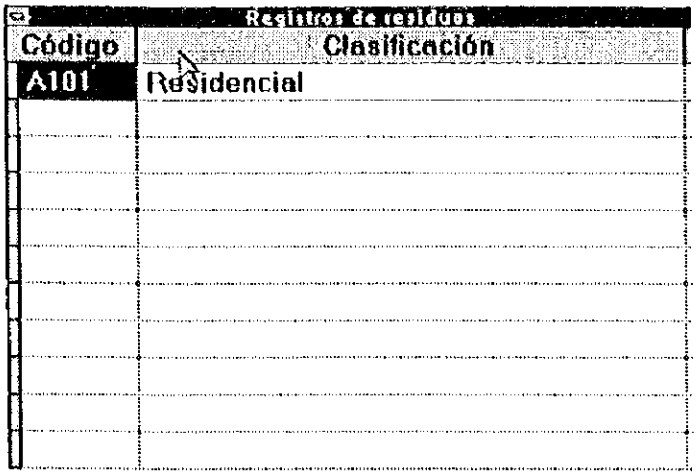
Luego defina las categorías, para la cual dentro de la opción **Clasificación de Residuos** , elija la opción **Categorías** y aparecerá la siguiente pantalla.



1. Elija le tipo del cual se van a definir las categorías.
2. Si existen algunas categorías definidas aparecerán en la siguiente pantalla.



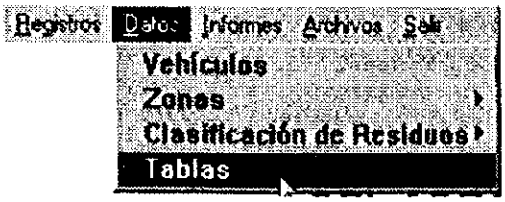
3. Para agregar nueva categoría
   - Presione φ y le habilitará una nueva fila para ingresar los detalles correspondientes de la categoría.
   - El código nuevo se generará automáticamente.
4. Para eliminar una categoría.
   - Seleccione la categoría que desea eliminar y presione v
5. Para agregar una sub-división de la categoría presione ρ y le aparecerá la siguiente pantalla.



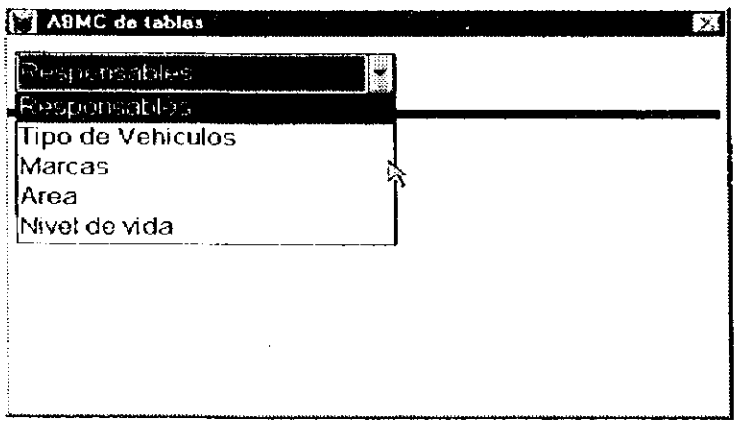
- Para agregar una sub-división presione φ, y el código se generará automáticamente y luego le habilitará para cargar los detalles.
- Presione ε, para volver a la pantalla anterior.

6. Para imprimir la tabla de clasificación de residuos presione 0.

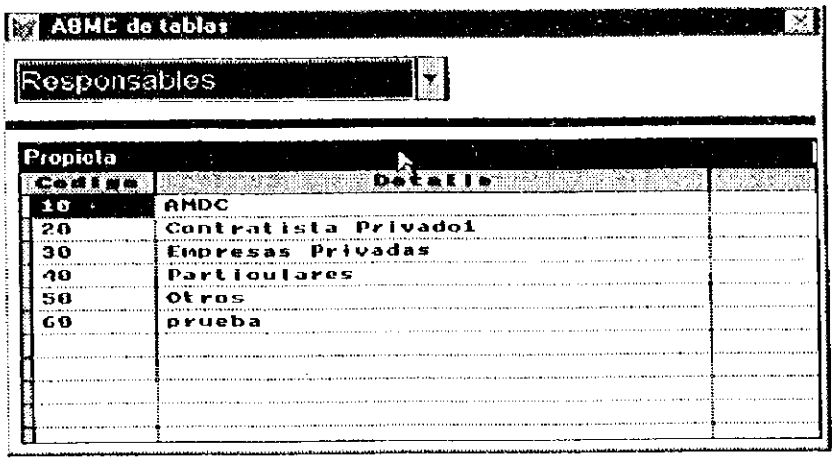
4. Tablas



Para actualizar todas las tablas utilizadas por el sistema, dentro del menú **Datos**, seleccione la opción **Tablas** y le aparecerá la siguiente pantalla.



Seleccione la tabla deseada y presione ρ. Y le aparecerá una pantalla similar a la siguiente de acuerdo a la tabla elegida. Todos los procedimiento de manejo de los datos de las tablas son similares.



1. Para agregar.
   - Presione φ y le aparecerá una ventana en donde debe ingresar el código.
   - Ingrese el detalle y presione ρ.
2. Para Eliminar
   - Seleccione la fila que desea eliminar y luego presione ν.Ingrese el detalle y presione ρ.
3. Para imprimir presione 0