Chapter 8 Collection and Transport

8. Collection and Transport

8.1 Time and Motion Survey Results

8.1.1 Summation of Results

The results of the survey are shown in the following table.

Truck	m3	Trip 1			Trip 2			waste dens. (t/m3)	remark
		time (min)	haul (ton)	min/ ton	time (min)	haul (ton)	min/ ton		
A) Boudheb									
Compactor (117202)	12	177	6.83	26	65	2.53	26	0.60	
Dump truck (73912)	3.5	231	3.07	75	NA	NA	NA	0.44	1.9 x volume
B) Zaouia									
Dump truck (117051)	4.0	236	3.53	67	NA	NA	NA	0.46	2.0 x volume
Dump truck (90381)	4.0	255	4.36	58	NA	NA	NA	0.55	2.0 x volume
C) Biada									
Dump truck (63956)	5.6	218	2.90	75	NA	NA	NA	0.37	1.4 x volume

8.1.2 Reports

A report was prepared for each survey based on a record kept during the survey. The reports are inserted hereafter.

(1) Time and Motion Survey
Urban Commune Boudheb
Compactor (12 m^3), License no.: 117202 G
November 19th, 1996

1. Two trips were done by the truck, starting from the garage at 06:36 and returning at 12:10.
2. The crew comprised, in addition to the driver three (3) workers.
3. There was an imbalance between both trips with the first trip serving 56 communal bins (36 large and 20 small) and the second trip serving 23 (22 large and 1 small).
4. The specifics of the trips are as follows;

	time	distance	communal bin	
	(min)	(km)	750 lit	360 lit
Garage to Trip 1, sta. 1	6	1	0	0
Trip 1, sta. 1 to last sta.	141	7.3	36	30
Breakfast break	36	0	0	0
Last sta. to Dump site	10	3.8	0	0
At dump site	12	0	0	0
Dump site to Trip 2, sta. 1	8	3.5	0	0
Trip 2, sta. 2 to last sta.	65	2.2	22	1
Last sta. to Dump site	12	3.9	0	0
At dump site	33	0	0	0
Dump site to Garage	10	3.1	0	0
Average of Shift	333	24.8	58	31

5. During the first trip most of the containers were 60 to 70% full. They appeared to be more full during the second trip. Only 2-3 containers were found to be overflowing with waste.
6. Although the previous day was a national holiday, the compactor worked here. Therefore the collected waste represents one day's waste.
7. All bins originally were numbered (but some numbers are worn out). In addition on some of the bin sides a poster was stuck urging citizens to discharge the waste inside the container.
8. The bins were brought to the truck by the worker, mechanically emptied and then returned to their original position. Although it is possible to empty two small bins at one time, this was not necessary because not more than one small bin was placed at one location. It was quicker to empty the smaller bins than the larger bins which required some maneuvering. Each bin serves a number of houses and this system has effectively replaced door-to-door system. A small fraction of the smaller bins were wheeled to the truck from distances of about 50 meters.
9. The small bins have two wheels while the larger ones have four. Four (4) of the larger containers had one of the wheels broken which made moving the bin difficult.
10. Sometimes the workers directly collected individual bins from houses. Total of such bins was 2 in the first trip, reaching 26 in the second, when the truck passed through one street collecting from all the houses.
11. In principle any wastes around the containers were not removed. Only the waste spilled from the container during emptying was cleaned up.
12. Two containers were reported to have been damaged by burning, but this was considered to be unintentional.
13. It was noted that mostly children bring out the waste and put it in to the containers.

14. A number of complaints were heard from the residents (4 in the first trip and 3 in the second) concerning the container location and the bad odor emitting from them. All requested that the containers be moved to a different location.
15. When the waste was discharged from the compactor at the disposal site a large amount of leachate was emitted from the truck.
16. The compactor was washed at the dump site after the second trip using a hose fixed to the truck and its water tank.
17. The compactor is said to use 40 liters daily.
18. From 9:03 to 9:39 the crew stopped for breakfast at a resident's house.
19. The waste of a medical center located in the urban commune was collected directly from their individual bin (about 40 liters) which they brought out when the truck arrived. They did not appear to use the nearby communal container.
20. Some general conditions of the area were as follows;

- land use was mainly residential
- inner streets (alleys) were largely paved with concrete
- much manure was noticed on the streets indicating animal movement
- open spaces were not so dirty but evidence of waste burning was observed there

Points to confirm with the Urban Commune municipal engineer;

- problems met and ways they were resolved in placing of the containers in front of residents houses or far from them
- what campaign was used to persuade the residents to shift from the door-to-door service to the communal container service
- responsibility for container maintenance (washing) is not defined
- countermeasures against damaging of stealing of containers
- relationship between compactor and sector (one sector served by one compactor?)
- compactor work load on Sundays

(2) Time and Motion Survey
Urban Commune Boudheb
Dump truck (3.5 m^3), License no.: 73912 G
November 20th, 1996 (Wednesday)

1. One trip was done by the truck, starting from the garage at 06:53 and returning at 11:31.
2. The crew comprised, in addition to the driver three (3) workers. Collectors uniforms were incomplete, one with gloves, a second overalls, and the third with boots.
3. Originally it was planned to follow another truck but that was out of order so we changed to this truck.
4. The truck is about 15 years old, and its age is showing. There were no stop lights, turning signals, only one side mirror and it was started by rolling down a slope in the park.
5. The specifics of the trips are as follows;

From	To	Time (min.)	Distance (km)	Bins number	ave. speed (kph)
Garage	Benzene sta.	3	1.3	0	26
Benzene sta.	Coffee shop	8	2.2	0	17
Coffee shop	1st Urban Sta.	1	0.7	0	42
1st Urban Sta.	last Urban St.	163	5	946	2
(Breakfast break for 16 minutes)					
last Urban Sta.	1st Village start	8	2.2	0	17
1st Village start	1st Village end	7	0.4	15	3
1st Village end	2nd Village start	2	0.4	0	12
2nd Village start	2nd Village end	47	1.5	170	2
2nd Village end	Dump site in	4	0.91	0	14
Dump site in	Dump site out	16	0	0	0
Dump site out	Garage	30	4	0	8
Total		289	18.6	1131	4

Assuming;
Volume actually transported = 1.9 time box volume = 6.7 m^3
Waste amount in tons = 3.07 t
Indicators are as follows;
Unit generation rate = 0.38 - 0.42 kg/cap
(based on number of bins (+ 5%) representing household number and 4.9 members per household according to 1994 census)

6. Only one trip was implemented. The truck spent 75% of the time in an urban area, where about 80% of the hauled waste was collected, and the remaining time and waste was from two villages.
7. Majority of individual bins were plastic or tin containers with no covers. Plastic bags accounted about 20% of the total. No liners in the bins were used
8. Majority of bins were already discharged prior to the truck arrival in the urban area. The truck driver also sounded his horn all the time (rather noisy) to inform the residents of his presence. In the villages most waste bins were discharged after hearing the truck arrive.
9. There is the problem of animals ripping open plastic bags. However, unlike other urban communes presence of human scavengers was not noted.
10. Collection was mostly door-to-door. A small number of open stations were found in

the case of inaccessible areas.

11. Waste collectors did not clean under or near the bins where there was scattered waste.
12. Some waste separation during the collection by the workers, but this did not seem to delay the work very much.
13. Mostly ladies and elderly persons were bringing out or taking back the bins. In most places bins were not guarded by their owners, due to early time of the day or no fear of theft.
14. In the urban area the route used by the truck contained narrow streets but there was no problem of roadside parking. Lack of parked cars was significant, and little access problem was noted. In the villages area, the roads were unpaved and badly leveled. It was not possible to use our passenger vehicle in this area.
15. No complaints were heard from the residents.
16. Not so much illegal household waste dumping in open spaces, but construction waste is frequently left there. Traces of waste burning in some vacant lots was observed.
17. Collection workers treated the bins properly and cooperation amongst the three appeared to be okay. There was some separation of waste by the crew member on the standing in the box.
18. The low sides of the truck helped in loading-unloading of the bins. However waste scattering was observed as the truck traveled to the villages. The waste was gradually loaded on from the rear end to the front with the waste build up in the rear side.
19. In the urban areas the driver explained that many of the households discharge their waste on alternate days.
20. Residents of the villages commented that their more important concern was for drinking water rather than SWM. Drinking water is not supplied in that village.

Points to confirm with the Urban Commune municipal engineer;

- maintenance problems related to the poor truck condition
- problems on controlling human scavengers
- design of routing (roughly 20 to 30% of time may be saved by eliminating rear movements and increasing open stations, etc.)
- in the same sense workers increased to 4 may also speed up the process (cheap labor costs?)
- door-to-door service in the villages using the dump truck is very unsuitable and armroll + communal container should be considered there.
- need to cover waste on the truck so as to eliminate waste scattering along the way

(3) Time and Motion Survey
Urban Commune Biada
Dump truck (sides elevated 5.6 m^3), License no.: 63956 G
November 21st, 1996 (Thursday)

1. One trip was done by the truck, starting from the garage at 06:55 and returning at 11:32.
2. The crew comprised, in addition to the driver three (3) workers. Collectors had no uniforms except one with gloves. The workers were picked up along the way. However one worker arrived at about 07:38, a little late.
3. The specifics of the trip are as follows;

From	To	Time (min.)	Distance (km)	Bins number	ave. speed (kph)
Garage	1st Sta.	7	3	0	26
1st Sta.	last Sta.	218	8	1,018	2
(Breakfast break for 30 minutes, and tea break 8 minutes)					
last Sta.	Dump site in	20	6	0	18
Dump site in	Dump site out	15	0	0	0
Dump site out	Garage	17	8	0	28
Total		277	25	1,018	5

Assuming;
Volume actually transported = 1.4 time box volume = 7.8 m^3
Waste amount in tons = 2.90 t
Unit generation rate = 0.43 - 0.48 kg/cap
(based on number of bins (+ 5%) representing household number and 5.7 members per household according to 1994 census)

4. Only one trip was implemented.
5. Majority of individual bins were plastic or tin containers with no covers. No liners in the bins were used.
6. Roughly 70% of bins were already discharged prior to the truck arrival in the urban area. The truck driver also sounded his horn all the time to inform the residents of his presence.
7. There is the problem of animals ripping open plastic bags and scattering waste. Presence of human scavengers was notable (6 encountered). Mostly old ladies and one man with a cart.
8. Collection was mostly door-to-door. A small number of open stations were found in the case of inaccessible areas.
9. Waste collectors did not clean under or near the bins where there was scattered waste. Consequently many places remained dirty even after truck passed.
10. Some waste separation during the collection by the workers, but this did not seem to delay the work very much.
11. Lack of roadside parking of cars was significant, and little access problem was noted.
12. Truck had to access many unpaved roads, causing slow down in movement.
13. Poor design in routing notable. probably with more rational routing 20 to 30% of the time can be reduced.
14. Vacant lots between buildings were in general dirty with mainly construction waste and some household waste. However green spaces were clean and no litter was observed there. Many "do not litter signs" were posted at open spaces or painted on

the walls surrounding such spaces.

15. The collection work was supervised from time to time by a corporal on a motor-bike.
16. Along the route there was a social club which discharged a 40 lit. plastic bin from its restaurant. The club official explained that the truck arrives every day on schedule. However he complained of a bad odor emitting from a nearby empty space.
17. Collection workers treated the bins properly and cooperation amongst the three appeared to be okay. There was some separation of waste by the crew member on the standing in the box.
18. Residents were observed sweeping in front of their houses.
19. Streets were littered with paper waste and in many cases streets remained dirty even after the passage of the trucks.
20. One resident complained of rats on the streets because of too many waste bins placed in front of his house (an open station). Indeed remains of a dead rat was seen.
21. Driver reported that he washes his truck about once a week, at the garage. He also informed that he fills up gasoline for his truck as follows; Monday 40 liters, Wednesday 40 liters and Friday 20 liters (i.e. 100 liters per week).

Points to confirm with the Urban Commune municipal engineer;

- problems on controlling human scavengers
- how to deal with construction waste
- design of routing (roughly 20 to 30% of time may be saved by eliminating rear movements and increasing open stations, etc.)
- need to cover waste on the truck so as to eliminate waste scattering along the way
- 30% of residents bring out waste only after hearing honking indicates they may not be aware of the truck arrival time
- elimination of stray dogs and cats
- dirty appearance of the area even after being served by the truck because of not removing scattered wastes on the road side

(4) Time and Motion Survey
Urban Commune Zaouia
Dump truck (4 m^3), License no.: 117051 G
November 22nd, 1996 (Friday)

1. One trip was done by the truck, starting from the garage at 7:07 and finishing at the dump site at 11:45 (the truck did not return to the garage, but was parked at the driver's house because he had to work in the evening).
2. The crew comprised, in addition to the driver three (3) workers. Collectors had blue overalls and gloves. The workers were waiting at the collection route.
3. The specifics of the trip are as follows;

From	To	Time (min.)	Distance (km)	Bins number	ave. speed (kph)
Garage	1st Sta.	12	2.0	0	10
1st Sta.	last Sta.	236	11.1	1,357	3
(Breakfast break for 9 minutes, and tea break 5 minutes)					
last Sta.	Dump site in	20	7.2	0	22
Dump site in	Dump site out	15	0.9	0	0
Total		297	21.2	1,357	4

Assuming;
Volume actually transported = 2.0 time box volume = 8.0 m^3
Waste amount in tons = 3.53 t
Unit generation rate = 0.34 - 0.42 kg/cap
(based on number of bins (+ 5%) representing household number and 5.2 members per household according to 1994 census)

4. Only one trip was implemented.
5. Majority of individual bins were plastic or tin containers with no covers. No liners in the bins were used. However plastic bags used in this route appear to be more than those used in the other two routes of Boudheb and Biada.
6. At the start of the trip, and up to about 10:00 most of the bins were already discharged prior to the truck arrival. The truck driver also sounded his horn all the time to inform the residents of his presence. However as the trip stretched on, more honking was needed to get the bins discharged. The driver explained that this route is usually implemented in two trips but he is doing it in one today because it is pay day and he wants to return early. Obviously the residents were not aware of this change.
7. There is a serious problem of animals ripping open plastic bags and scattering waste. Presence of human scavengers was most notable here (10 encountered, one of them a child not more than 12 years old). The kitchen waste is much sought after because of the breeding of cows and other farm animals in this area.
8. Collection was mostly door-to-door. A small number of open stations were found in the case of inaccessible areas.
9. Waste collectors did not clean under or near the bins where there was scattered waste. Consequently many places remained dirty even after truck passed.
10. Hardly any waste separation during collection by the workers, probably to impress us.
11. Lack of roadside parking of cars significant, and little access problem noted.
12. Poor design of routing. Driver explained that routing design is his responsibility.
13. Roughly half of the vacant lots between buildings were dirty with mainly

construction waste and some household waste. However green spaces were mostly dirty because they are being used as small pastures for the many animals in the area. Some "do not litter signs" were painted on the walls surrounding such spaces.

14. Bins brought out as the truck arrived were mostly carried by children. In many cases children made an effort to chase the truck to give them the waste, instead of giving up. Bins already brought out and those left at the small infrequent umber of open stations were not guarded by the residents.
15. In some instances the collection worker used a large sack to collect from bins in inaccessible areas and bring to the truck.
16. Observed some street sweeping activity in the area. Most street sweepings are dust with some litter paper. Sweeping in many of the unpaved streets is a big problem, because of the obvious difficulty of sweeping there.
17. Passed by market place along the route, but their waste was not collected. Cleansing chief explained that the market waste is collected every 4 - 5 days, in the evenings.
18. Collection workers treated the bins properly and cooperation amongst the three appeared to be okay. There was some separation of waste by the crew member on the standing in the box.
19. Driver informed that he uses 20 liters/day of gasoline for his truck.

Points to confirm with the Urban Commune municipal engineer;

- problems on controlling human scavengers
- how to deal with construction waste
- design of routing; wisdom of leaving the driver in charge of designing the route
- need to cover waste on the truck so as to eliminate waste scattering along the way
- sudden change of the truck arrival time without forewarning the residents may effect the extent of their cooperation
- elimination of stray dogs and cats
- dirty appearance of the area even after being served by the truck because of not removing scattered wastes on the road side

(5) Time and Motion Survey
Urban Commune Zaouia
Dump truck (4 m^3), License no.: 90381 G
November 25th, 1996 (Monday)

1. One trip was done by the truck, starting from the garage at 6:50 and finishing at the truck scale at 12:40, after measuring the empty weight. We left the truck at that point.
2. The crew comprised, in addition to the driver three (3) workers. Collectors had incomplete overalls and gloves. The workers were waiting at the collection route.
3. The specifics of the trip are as follows;

From	To	Time (min.)	Distance (km)	Bins number	ave. speed (kph)
Garage	1st Sta.	5	1.0	0	12
1st Sta.	last Sta.	255	7.0	1,389	2
(Breakfast break for 20 minutes)					
last Sta.	Weigbridge in	15	4.0	0	16
Weighbridge in	Weighbridge out	10	0.0	0	0
Weighbridge out	Dump site in	20	8.0	0	24
Dump site in	Dump site out	10	0.0	0	0
Total		335	20.0	1,389	4

Survey results;
Volume actually transported = 2.2 times box volume = 9.0 m^3
Waste amount in tons = 9.08 - 4.72 = 4.36 t
Density of hauled waste = 0.48 t/m^3
Indicators are as follows;
Loading time (min./ton) = 76.8 min./ton
Crew efficiency = 1.09 ton/crew
Unit generation rate = 0.55 - 0.68 kg/cap
(based on number of bins (+ 5%) representing household number and 5.2 members per household according to 1994 census)

4. Only one trip was implemented. The driver explained that he normally does two trips in this route but today he is trying to complete the route collection in one trip.
5. Majority of individual bins were plastic or tin containers with no covers. No liners in the bins were used. However plastic bags used in this route appear to be more than those used in the other two routes of Boudheb and Biada.
6. Most of the bins (roughly 90%) were already discharged prior to the truck arrival. The truck driver also sounded his horn at times to inform the residents of his presence. Due to the ongoing cleansing campaign this route was served yesterday, Sunday, so waste amount collected today was not as great as that usually collected on Mondays.
7. Route near airport and "illegal" market operated on the airport ground in front of the newly inaugurated school. Early in the morning, before the market opened cows were seen grazing on the land, in the green area, on grass and the remains of yesterday's market activity. Later on the market came into swing. However no waste was collected from the market.
8. There is the problem of animals ripping open plastic bags and scattering waste. Presence of human scavengers was also noted here (3 encountered). Some residents complained of the scavengers who scatter the waste.
9. Collection was mostly door-to-door. A small number of open stations were found in

the case of inaccessible areas. In some instances the collection worker used a large sack to collect from bins in inaccessible areas and bring to the truck. I measured one such area in steps, walking about 30 steps on average to the truck.

10. Waste collectors did not clean under or near the bins where there was scattered waste. Consequently many places remained dirty even after truck passed.
11. Waste separation ongoing during collection by the workers (mainly plastic).
12. Lack of roadside parking of cars significant. Many unpaved road stretches along the route and steep slopes.
13. Amount of shops served on this route greater than that observed in other surveys. However commercial waste still represents a very small share (less than 5%).
14. Poor design of routing. Too much backing in to alleys.
15. A clinic was served on the way. One bin was discharged with mostly household waste in it, although there were medicines. A bakery was also served and two large bags were discharged from there.
16. Collection workers treated the bins properly and cooperation amongst the three appeared to be okay. However one of the two collecting the bins as rather elderly, and the younger was working more than him. Towards 9:00 AM the workers began to tire and their effort decreased, with spilling of some waste while loading on to truck. One of the workers wounded his hand by a tin bin but the work had to continue. The worker on national promotion earns 27 DH/day.
17. Waste scattering due to the strong wind blowing that day was notable, on the street and from the truck.
18. Some residents were observed sweeping in front of their homes.
19. One resident complained that the truck (or collection worker) does not pick up the bin from in front of his house and that he walks to the corner of the street (about 3 meters).
20. Truck exhaust pipe in poor condition and amount of exhaust gas emitted was too much. Some residents complained of the truck smell, saying the waste smell was better.
21. Driver informed that he uses 120 liters/week of gasoline for his truck.

Points to confirm with the Urban Commune municipal engineer;

- problems on controlling human scavengers
- how to deal with construction waste
- design of routing; wisdom of leaving the driver in charge of designing the route
- need to cover waste on the truck so as to eliminate waste scattering along the way
- sudden change of the truck work schedule without forewarning the residents may effect the extent of their cooperation
- elimination of stray dogs and cats
- dirty appearance of the area even after being served by the truck because of not removing scattered wastes on the road side
- difficulty in sweeping unpaved roads
- instruction in case worker is injured
- residents unwillingness to cooperate with the collection crew

8.2 Collection and Transport Improvement Plan

The collection and transport improvement plan was developed using MS Excel spread sheet. The procedure is explained hereafter.

1. The population was projected up to the year 2010 applying the national growth rates with some modifications to suit the condition of Safi (Chapter 3 of the Progress Report 2)

Pn, where P: population and n: year

2. Present waste unit generation rate (grams/person/day) was projected up to the year 2010 taking into consideration annual growth

Un, where U: unit generation rate, n: year

3. The generated waste amount (G) by year (n) was calculated

Gn = Pn x Un x 365 days

4. A spread sheet (Spread sheet A) using MS Excel software application was prepared and the above figures inserted.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			

5. The present collection service coverage was identified and collection service coverage targets were set. The target of 100% was set for the year 2010.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			

6. The existing trucks capacities and useful life were determined.

Spread Sheet B

a. Truck no.	b. Age	c. Ave. haul/ trip (ton)	d. Ideal trips/ shift	e. Ideal haul/ trip (ton)	f. Ideal haul/ day	g. Replace-ment year
Obtained information from the workshop		Assumed based on truck scale survey	Both were assumed based on truck age and actual performance during truck scale survey		d x e	If more than 8 years the following year was selected

7. The existing truck fleet were placed in Spread Sheet A, and the deficit in waste collection "supply", compared to waste collection "amount" was estimated.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			
6. Existing truck fleet capacity	ton	f (Spread sheet B) x 365			
7. Required new trucks capacity	ton	5 - 6			

8. The potential truck types and collection systems from which the new trucks shall be selected were identified and inserted in Spread Sheet A as follows;

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			
6. Existing truck fleet capacity	ton	f (Spread sheet B) x 365			
7. Required new trucks capacity	ton	5 - 6			
8. New trucks					
8.a. Compactor (12m3) with container	ton				
8.b. Compactor (8 m3) with container	ton				
8.c Compactor (12m3) with door-to-door and collection point	ton				
8.d. Compactor (8m3) with door-to-door and collection point	ton				
8.e Dump truck (4m3) with door-to-door and collection point	ton				
8.f Multi-loader (3m3) with container	ton				

9. A new spread sheet C was prepared for the identified truck types and collection systems; as follows

Spread Sheet C-1 - Factors for the calculation

New Trucks	i. Cost	ii. Capacity	iii. Waste density	iv. Crew number	v. Ave. distance	vi. Loading time (min/ton)	g. Running speed (kmh)	viii. Discharge time at disposal site
Same as those in Spread sheet A	Checked with manufac-turers	Confirmed by measurement when possible	Based on truck scale survey	Driver + 3 workers (multi-loader 1 worker)	From time and motion surveys	From time and motion surveys	From time and motion surveys	From time and motion surveys

Spread Sheet C-2 - Operation indicators

ix. Time for one trip (minutes)	x. Time for two trips (minutes)	xi. Shift time (min)	xii. Number of trips in one shift	xiii. Waste hauled/ shift (ton)	xiv. Required container number
(ii. x iii. x vi) + (2 x v/vii) + viii	2 x ix.	8 x 60 min - 45 min	(xi) / (ix)	(xiii) x (ii) x (iii)	xiii/(container capacity x 0.38 kg/m3)

Spread Sheet C-3 - Operating Costs (per working day)

xv. Salaries	xvi. Fuel & lubricants	xvii. Maintenance and repairs	xviii. Depreciation	xix. Indirect cost & misc.	xx. Total cost	u. Unit cost (DH/ton)
Driver + Collection crew + factor for insurances, holidays, etc. divided by 26 days	Either by trip number x consumption/trip or Distance x consumption/km	Consulted manufactured, estimate at 40% of purchase cost divided by truck age	Purchase cost divided by truck age	to cover various not included costs; (20% of (xv + xvi. + xvii + xviii)	xv + xvi + xvii + xviii + xix	xx / xiii

The unit cost is used to determine the cost efficiency of the identified collection trucks and systems.

10. The waste haul per shift (Spread Sheet C-2, xiii) was inserted in Spread Sheet A in front of each truck type.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			
6. Existing truck fleet capacity	ton	f (Spread sheet B) x 365			
7. Required new trucks capacity	ton	5 - 6			
8. New trucks					
8.a. Compactor (12m3) with container	ton	Spread Sheet C-2, xiii			
8.b. Compactor (8 m3) with container	ton	Spread Sheet C-2, xiii			
8.c Compactor (12m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
8.d. Compactor (8m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
8.e Dump truck (4m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
8.f Multi-loader (3m3) with container	ton	Spread Sheet C-2, xiii			
8.g Communal container metallic	3 m3	8.f/(3m3 x 0.38t/m3)			
8.h Communal container plastic	0.36m3	(8.a or 8.b)/(0.36m3 x 0.38t/m3)			
8.i Communal container plastic	0.72m3	(8.a or 8.b)/(0.72m3 x 0.38t/m3)			

The suitable truck type was selected taking into consideration the unit cost (Spread Sheet C-3(xxi)) and characteristics of the commune (e.g. too many narrow streets, citizens cooperation in promoting communal container system, etc.) and waste types (e.g. commercial/institutional waste if generated by a small number of large generators can be better handled by multi-loader, etc.). The selected truck waste haul/shift was multiplied by the number of trucks to be introduced and the product was inserted under the year (and for 7 continuous years thereafter). An example is shown in Spread Sheet A, where 2 large compactors with communal containers and 1 multi-loader were selected in 1997.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			
6. Existing truck fleet capacity	ton	f (Spread sheet B) x 365			
7. Required new trucks capacity	ton	5 - 6			
8. New trucks					
8.a. Compactor (12m3) with container	ton	(Spread Sheet C-2, xiii) x 2 units	tot. haul/ shift	tot. haul/ shift	
	no.	number of units			
8.b. Compactor (8 m3) with container	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.c Compactor (12m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.d. Compactor (8m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.e Dump truck (4m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.f Multi-loader (3m3) with container	ton	(Spread Sheet C-2, xiii) x 1 unit	tot. haul/ shift	tot. haul/ shift	
	no.	number of units			
8.g Communal container metallic	3 m3	8.f/(3m3 x 0.38t/m3)	no.	no.	
8.h Communal container plastic	0.36m3	(8.a or 8.b)/(0.36m3 x 0.38t/m3)	no.	no.	
8.i Communal container plastic	0.72m3	(8.a or 8.b)/(0.72m3 x 0.38t/m3)	no.	no.	

As shown in the above table, and based on the truck type selection it was necessary to calculate the number of containers for the multi-loader (metallic 3m3) and compactors (mix of plastic 0.36m3 and 0.42m3 containers). The calculation was as follows;

Container number = (shift/haul)/(container volume x waste density x 0.8 filling)

The introduced metallic containers in one year are inserted in 4 more consecutive years, while the plastic containers are inserted in 2 more years.

11. For each year the capacity supply was recalculated based on the introduced trucks and the existing ones purchased in the previous years, as follows;

    Capacity of trucks introduced within the previous 8 years +
    Capacity of trucks introduced in that year =
    Total capacity

    The total capacity exceeded the waste collection demand by 10% in order to cover contingencies.

12. In Spread Sheet A the costs per one truck shift were included for each cost item, and multiplied by the number of trucks used in one year the total cost were obtained.

Spread Sheet A

	Unit	calculation	1997	1998	year n
1. Projected population	person				
2. Unit generation rate	gm/per/d				
3. Generated Waste amount	ton	1 x 2 x 365 d			
4. Waste collection targets	%				
5. Waste collection amount	ton	3 x 4			
6. Existing truck fleet capacity	ton	f (Spread sheet B) x 365			
7. Required new trucks capacity	ton	5 - 6			
8. New trucks					
8.a. Compactor (12m3) with container	ton	(Spread Sheet C-2, xiii) x 2 units	tot. haul/ shift	tot. haul/ shift	
a.1)	no.	number of units			
8.b. Compactor (8 m3) with container	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.c Compactor (12m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.d. Compactor (8m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.e Dump truck (4m3) with door-to-door and collection point	ton	Spread Sheet C-2, xiii			
	no.	number of units			
8.f Multi-loader (3m3) with container	ton	(Spread Sheet C-2, xiii) x 1 unit	tot. haul/ shift	tot. haul/ shift	
	no.	number of units			
8.g Communal container metallic	3 m3	8.f/(3m3 x 0.38t/m3)	no.	no.	
8.h Communal container plastic	0.36m3	(8.a or 8.b)/(0.36m3 x 0.38t/m3)	no.	no.	
8.i Communal container plastic	0.72m3	(8.a or 8.b)/(0.72m3 x 0.38t/m3)	no.	no.	
9. Cost by truck type					
9.a. Compactor (12m3) with container					
- Salaries	C-3, xv	8.a1) x C-3,xv			
- Fuel and lubricants	C-3, xvi	8.a1) x C-3,xvi			
- Maintenance and repairs	C-3, xvii	8.a1) x C-3,xvii			
- Depreciation	C-3, xviii	8.a1) x C-3,xviii			
- Indirect costs	C-3, xix	8.a1) x C-3,xix			
- Total cost	C-3, xx	8.a1) x C-3,xx			
etc.					

The total cost was then calculated for all the truck types and divided by the total waste collection amount for one year. If the unit cost was considered too high the truck selection was reconsidered. Other operation indicators per year were also evaluated;
waste amount collected/collection crew number
waste amount collected/number of trips
waste amount collected/truck/shift

Chapter 9 Public Education

SAFI DEMONSTRATION PROJECT OF PUBLIC AWARENESS

The present report appendix of the Safi demonstration project of public awareness and education constitutes a detailed report of the major activities. This report, which is a thematic summary of the principal axes of the program, completes and specifies the global summary presented in the second part of the Progress Report.

1 Summary of the Project: "Posters"

1.1 Description of the Project

1.1.1 Objectives

The objective of posters is to reach all types of social groups by a clear and artistic presentation of a series of messages. The basic idea of posters has been to pass on messages of awareness of problems, messages of formulation of objectives (clean cities, better think of one's waste for the future), and messages of positive action and attitude contributing to waste management.

In order to accomplish the targeted objectives to a larger extent, the posters should present the following advantages:

- The legibility of messages for all categories of the population;
- The artistic quality in order to arouse interest and, therefore, avoid the possibility that these posters can end up in being a visual nuisance in the landscape;
- A strong and lasting impact, especially by size and time of display as well as by the quality and choice of sites.

This is the reason why the "posters" project has had as the major activity the preparation and display of giant posters. More academic posters have permitted the completion of this project, especially the completion of the geographical and social coverage of the sites of display.

1.1.2 Giant Posters

There are 3 complementary series of giant posters with 2m x 2,5m format. Every series has 10 units.

The giant posters are intended for an outside and a long-term display. They are plasticized in both sides by using numerical printing through an electrostatic process with resistant pigments ink.

The principal characteristics of these posters are the following:

- An unusual dimension;
- A restricted printing compensated by a strategy of public questioning;
- A presentation of messages that privileges the graphic expression;
- A conception that is directly realized by local artists within the framework of a competition of drawing.

1.1.3 Standard Posters

There are 2 complementary series of standard posters with a format of about 0,5 x 0,6m. Every series is printed in 700 units, which gives a total of 1400 units.

These posters are intended for inside media on a fixed or movable site (bus). The display on waste collection trucks has been added as an option. They are realized on 135g of art paper by the four-color printing.

The major characteristics of these posters are the following:

- A language that is at the same time textual and full of imagery
- An expression that is more intellectual than that concerning the giant posters
- A conception that is directly realized by local artists through drawings.

1.2 The Activity of Preparation of the Drawings of Posters

1.2.1 Drawing Competition

1) Preparation of the Competition

A drawing competition has been launched on November 15th, 1996 for local artists to be achieved on December 9th. This competition has aimed at the creation of the drawings of posters, on the hand, and at the creation of the mascot of Safi on the other hand.

The local artists who have participated are especially teachers of plastic art and most of them are members of a local plastic art association, namely the Ra association. There have been 17 registrations for this competition. Among the participants, 12 persons have submitted their drawings before the competition deadline, December 9th.

The artists have met 2 times with the representatives of work committee in order to determine what has been expected from them. The first meeting (November 15th) has permitted us to launch the competition, explain the project, and explain the drawings and the types of messages expected. The second meeting (November 26th) has ended in new adjustments and complementary explanations concerning the messages and the different drawings.

2) Competition Rules

The rules of competition have been the following:

- Produce either a drawing of mascot or a set of 3 drawings of posters, or both at the same time.
- Formulate messages within the limits of 3 themes having different bases, with 1 theme per poster. Examples of messages have been given and the "main-topics" have been explained. This approach has allowed a certain freedom of expression of messages by trying to maintain them in well defined frames. The approach is explained further on.
- The drawing of the mascot is presented in the form of logo accompanied with a written message that summarizes a philosophy, an attitude, or ethic. Some examples have been discussed such as "Me, I keep my city clean" or "Me, I'm concerned with the waste in my city".

3) The Problem of the Mascot

The problem of whether to include or not the mascot in the drawings of posters has been well. The ideal step would have rather been to precede the competition of the drawings of posters by that of mascots. Such a step has been unrealizable with respect to time schedule of the study team. The 2 competitions have, therefore, been launched at the same time by allowing the artists to include, if they want, typical character in their drawings of posters. Concerning the mascot, it should be presented in the form of a logo in such a way that it can be used freely in the different media of information and increase of awareness concerning this program or, if necessary, the later programs.

1.2.2 Proposed Messages

1) Identification Method of Messages

Every series of drawings should, as far as possible, answer the following questions:

- What is the problem (report on the situation)?
- What do we aim at (objectives)?
- What should be done (ethic, action)?

Every one of these questions represents a major and basic topic that can serve as a frame for the definition of a message. These "main topics" have been presented in a way that is quite theoretical and they have taken shape by some precise examples. The "main topics" have been presented in the form of diagrams and discussed with artists (Fig. 1, 2 et 3). For instance, a message concerning the maintenance of the beauty and the cleanliness of the city makes part of the topic "objective" (to have a clean city). A message concerning the cooperation between waste collectors and residents is part of "ethic / attitude". Similarly, there is a message about the duty to "think of one's waste".

These diagrams show that the messages concerning waste are in keeping with the problems of improvement of waste management and with the problems of protection of urban environment and environment. These messages can have different degrees of materialization that are illustrated by using the circles in the diagrams according to the axes of arrows. Concerning the levels of messages, the drawing can represent many levels at the general level (the squares in figures) as well as at a large level (the circles in figures).

2) Examples of Messages

The topics and types of messages expected have been explained in such a way to leave a relative freedom for the artists to express themselves. However, artists have been asked to keep in mind the fact that:

- Posters should be a communication movement that concerns waste (and not the protection of nature or the urban environment, for instance);
- The message is aimed at the general public and it deals with the everyday life waste of this public (in the city).

An example of the use of the theoretical plans of the identification of messages and of their frame has been presented for the precise case of a poster about the cooperation between the Commune and residents for the better manage of waste. Two cases concerning this topic have been discussed:

- 1st case / general plan: a charter of actions between the Commune and resident for a better collection of waste. On the one hand, the Commune is represented through a drawing of what it does and things it likes to improve. On the other hand, the resident is represented through a drawing of what he should do. In the poster, references to environment plan as ecocitizenship occur.
- 2nd case / large plan: The waste collector near his truck with a positive and jovial speed, ready to communicate with residents and help them improve his service. The resident is represented as being ready for a discussion to act usefully and showing a sense of curiosity ("think of waste").

3) Examples of Slogans

In addition to the examples of messages, some slogan examples have been presented during these meetings:

- For posters:
  - "React and think of "waste""
  - "The right of a clean city"
  - "In Safi, we react against waste, we think of the future"
- For the mascot:
  - "Me, I think of protecting my city"
  - "I react for the cleanliness and beauty of my city"

1.2.3 Drawings Selection

1) The Jury

The jury of the drawings competition has had a meeting in the premises of the Urban Community of Safi on Dec. 11th and 12th, 96 in order to initiate the selection of drawings. The jury's work has been preceded by a meeting to officially launch the selection. The meeting has been presided over by the President of the Urban Community and the First Khalifat (deputy) of the Governor, in the presence of the Presidents of Communes of Boudheb, Zaouia and Biada, the Heads of District and also the members of the jury, namely:

- Urban Community (1)
- Urban Communes (3)
- Province (1),
- Delegation of the Ministry of Youth and Sports (1),
- Delegation of the Ministry of Public Health (1),
- Delegation of the Ministry of National Education (1)
- Delegation of the Ministry of Cultural Affairs
- Culture and Leisure Association (ACL) (1),
- Environment and Development Association (1)

2) Selection Procedure

The procedure of selection has been divided into 3 stages:

- Discussion with artists: Artists can express themselves and give their opinions concerning all the drawings presented. This session has turned out to be difficult and not decisive;

- Pre-selection by the jury that has taken into consideration the possible remarks of artists and has made a decision concerning the deserving persons;
- Final selection made by the decision of the First Khalifat, Presidents, and the Representatives of authorities.

The jury has, therefore, initiated the following selections:

- The drawing of the mascot;
- The first 3 sets of drawings of posters;
- The drawings reserved for the 5 series of posters descended, in principle, from the first 3 sets of drawings and complementary of one another according to the method of choice of messages.

3) Selection Criteria

The criteria of selection are presented in the table below (Table 1). Each criterion has been endowed with a maximal grade. It is the total of grades that has permitted us to decide the participants in the competition. Concerning the drawings of posters, every one of them has been marked on the basis of these criteria in a way to take into consideration the series of 3 drawings that have been required from every participant.

Table 1. Criteria for Selection of Posters Drawings

	Marked out of
1. Respect of the conditions of competition: number of drawings, topics, objectives	6
2. Visual message responding to the question and clearly expressed	8
3. Textual message responding to the question and expressed clearly	8
4. Harmony of colors	2
5. Harmony of forms	2
6. Dynamism, optimism, "positivity" of the message	8
7. General aspect: increase of awareness and comprehension	6
TOTAL	40

1.2.4 Competition Results

The series of drawings that have been sent to the Urban Community at the end of the competition constituted the object of a public display from February 20th to March 2nd in relation to the itinerary display about the urban environment of the Ministry of Environment.

During the selection of drawings meant to be published as posters, the jury has been faced with the problem of dissociating the drawings that clearly constitute part of the general logic of every set. It has, therefore, been aware of the importance of not dissociating the drawings in every set, especially in the set of the 1st prize.

It has been advisable to modify the conditions of display in order to take into consideration these problems. It has been decided to preserve the 3 drawings of the first set for the giant posters and 2 drawings of the second set for the standard posters.

It is this step that has permitted the redefinition and finalization of a certain number of points as the number of series and the final size of posters. The number of the series of

posters has been raised to 5 rather than 3 at first. An initially planned series of 1000 posters has been transformed to a double series of 700 posters. The double series of 12 giant posters each has been transformed to a triple series of 10 posters each. Besides, the size of posters has also been modified so that the mascot can be inserted appropriately. The size of the giant posters has been raised to 2m x 2.50m instead of 2 x 2m initially. That of standard posters has been raised to 0.5m x 0.625m instead of 0,5 x 0,5 at the beginning.

In short, the 3 drawings reserved for the giant posters belong to the same set (1st set). The same thing for the 2 drawings of standard posters (2nd set). This easiness has been possible thanks to the quality of these 2 series of drawings.

Once selection is made, a certain number of adjustments proved to be essential, following the discussion by the group of the jury and the coordination with all local authorities, especially the Governor. The modifications has dealt with the vocabulary used, certain drawings themselves and with adjustment between drawings and the mascot.

1.2.5 Recompense Prizes

The prizes meant to recompense the competition prize winners are granted within the framework of JICA budget intended for this project. An official ceremony for the awarding of prizes has also been organized within the framework of the opening ceremony of the campaign expected on February 27th, 1997. Concerning the prize giving, it has been made by the Urban Community of Safi.

The prizes have been awarded per sets of 3 drawings on the basis of one prize per set. The 3 prizes thus correspond to 3 sets, i.e. to a total of 9 drawings.

Following the discussions with the artists and by considering the importance of their contribution to the working out of these posters, an amount of 30000DH has been devoted to these prizes in a priority manner in the budget allowed by JICA. The prize giving has been made in the following way:

1st mascot prize: 8000DH
1st poster prize: 9000DH
2nd prize: 5000DH
3rd prize: 3000DH
5 participation prizes for 5 persons: 1000DH x 5 = 5000DH

The Urban Community decided, later on, to grant a participation prize to other contributors as well, which it should do from its own budget.

1.3 Posters Description

1.3.1 Giant Posters

The first poster represents a street scene that shows the state of damage of the urban environment due to the presence of a black point. The leachate is flowing out in the manholes of sewers and dustbins are full of waste. The mascot constitutes a part of the scene and it points out the responsibility of the resident, represented by a woman character having an expression of guilt.

The second poster poses the question, in the form of a big question mark, of the way of dumping of waste. All the elements of the preceding poster are found in this poster. Yet, these elements become the centers of questions: the collection means in contrast to the black point and the action of the woman who throws her waste in the street in contrast to the mascot that poses the question.

The third poster provides the answer: waste is stocked and disposed of appropriately and, consequently, cleanliness and beauty are found again. The mascot is delighted.

These 3 posters will be reproduced in the final report by using color and providing a translation of the terms used.

1.3.2 Standard Posters Description

The 2 standard posters first give guide marks: the silhouette of the city together with the greenery and the presence of the sea. The link that is made in these posters between waste, city and sea is ingenious and very interesting.

A first poster expresses the advantage of a clean and elegant city as a result of the good control of waste. The mascot presents the message together with a personified dustbin that expresses satisfaction.

A second poster illustrates, also in a symbolic way, the cooperation between collection services and residents.

These 2 posters will be reproduced with colors in the final report together with the translation of the terms used. The second poster has also been used as an illustration in the folder.

1.4 Display Sites

1.4.1 Giant Posters Sites

The problem of display sites has been related especially to the giant posters. The problem of the giant posters is that they require possibilities of display that have not been anticipated in Safi city. Every one of the 3 communes of Safi has got the job of setting 10 posters covering the 3 series.

The list of display sites has been drawn up on the basis of the following criteria:

- Strategic places, i.e. at great visibility and great frequency by the public;
- Places that have to be public so as to avoid the problems of authorization;
- Places that are highly secured in order to avoid the problems of vandalism.

On this basis, the possibilities of display have been listed:

- Display by direct pasting on a wall;
- Display by hanging up a board on a wall;
- Display by presentation on a trestle structure.

The result of this evaluation has been the choice of 12 sites per Commune, all requiring a stand structure per wall board or per raised board (Table 2). The list of the places of display as well as their location on map will be presented in the final report. Some photos have been taken in sites to show some examples of the result. These will be available in the final report.

2) Sites for Standard Posters

The display sites for the standard posters have been identified as follows:

- Premises of ministerial delegations;
- Premises of associations;
- Communal and Provincial premises;
- Hospitals;
- The city buses;
- Collection trucks.

1.5 Giant Posters Setting Up

1.5.1 Choice of Stands

The choice of materials to realize the stands and finalize their characteristics have posed serious problems of finalization. A order of 2 series of wood and metal samples has been made before the final choice.

The advantages of metal stands are numerous:

- Limitation of the risks of materials theft;
- Limitation of the possible effects of vandalism;
- Good resistance of the local climate;
- Good stability and good esthetic.

The principal disadvantage is the weight of the equipment. For instance, there are no carrier walls that can hold up appropriately and with security the weight of wall boards that are made of iron. This disadvantage has been behind the delay in setting up the boards; 2 of 3 communes have not taken this problem into consideration during the choice of sites and the order of boards.

The major disadvantages of wood are:

- High risk of theft;
- Weak resistance of plywood to the effects of the local climate;
- Great weakness of fixing to the ground.

To sum up, only metal stands have been realized with the exception of 2 wood stands.

1.5.2 Public Security Problem

In addition, the question of the minimal norms of security against the risks of accidents has been raised. Having given the dimensions of these equipments, their location in a much visited place as well as the long duration of display, it has been necessary to give a special care to stability and to fixing.

Thus, solid fixing has been planned for wall boards as well as for trestle boards. And the quality of posture has constituted the concern of communes.

1.5.3 Vandalism Problem

The problem of the high risk of vandalism, that regards the display stands or posters themselves, has been a persistent subject of concern for the durability of display. The prevention of vandalism has taken different forms:

- By the choice of sites;
- By the choice of boards that are anchored to the ground;
- By fixing closing sticks around posters by screwing on boards.

1.5.4 Accomplishment of Stands

The displaying of giant posters has been planned to last for more than 6 months, from January to September 1997. In fact, the start has been on February 27th, the date of the official launching. This display has required the accomplishment of wall and raised boards in order to make up for the non-existence of such stands on desirable sites.

These boards have been financed by JICA except for a part that has been taken charge of by Boudheb in its territory. In general, the communes have not been enthusiastic with respect to the matter of being responsible for a part of the costs of the boards making. That is why the total number of display stands, that had been at first 30 posters, has been reduced to 25 units in total. The final distribution of display stands has been as described in Table 2.

Concerning the setting up, the communes have been in charge of the preparation of the necessary foundations for trestle boards and of fixing the boards.

Table 2: Display Boards Final Distribution per Commune

Urban Communes of	Wall Board	Trestle Board	Total
Zaouia	5	3	8
Biada	3	5	8
Boudheb	0	9	9
TOTAL	8	17	25

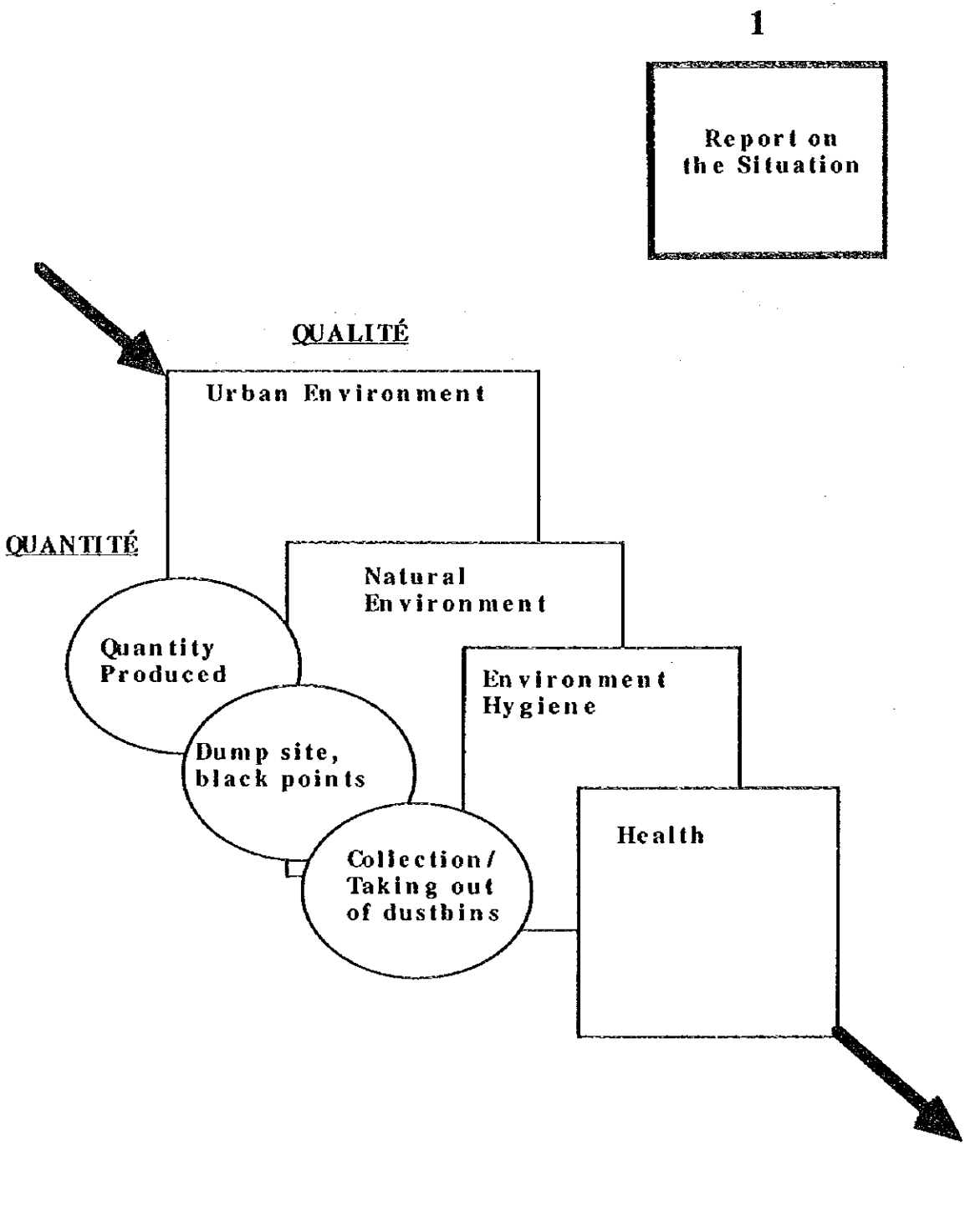

Fig. 1. Diagram Illustrating the Different Messages of Posters (1)

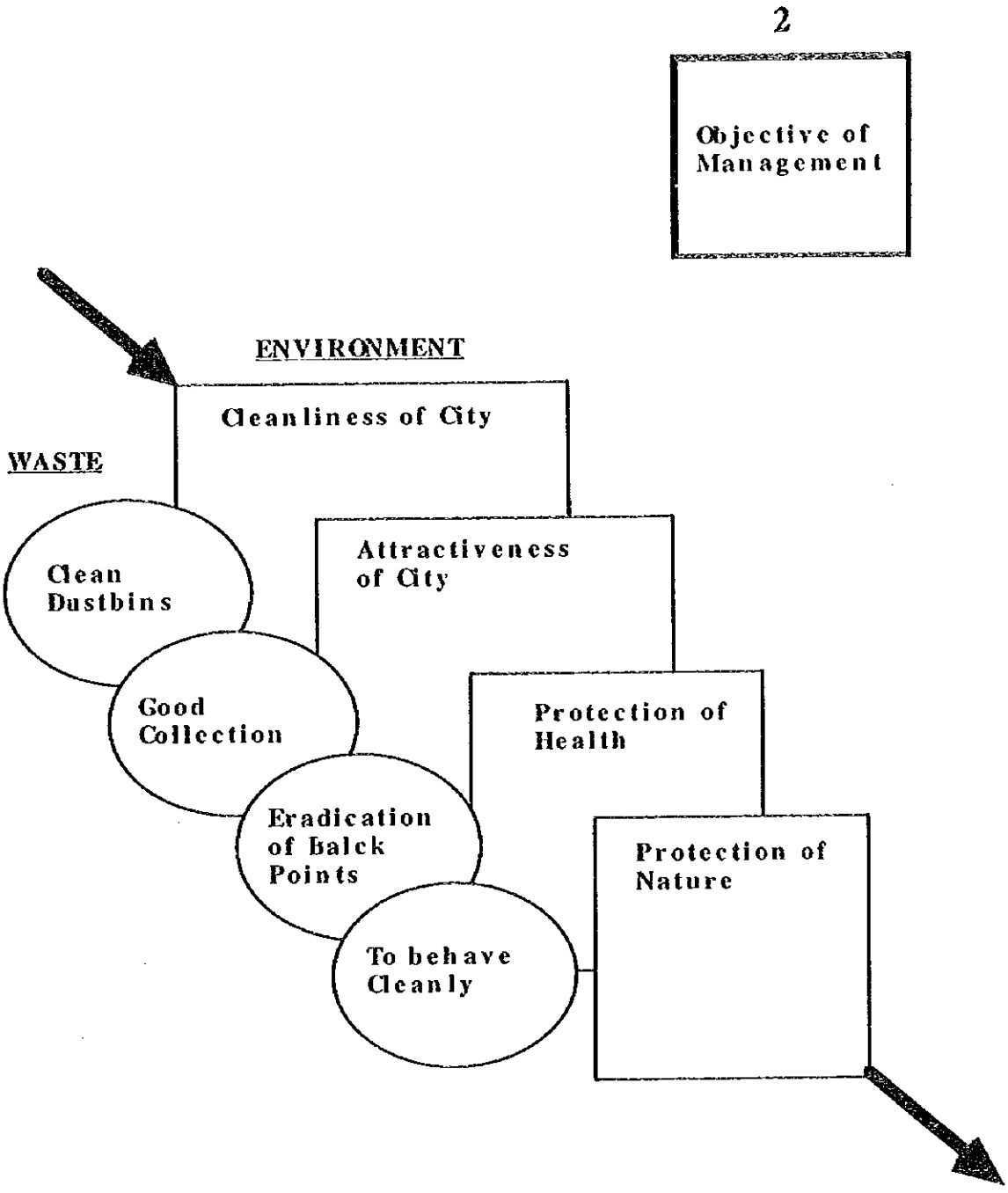

Fig. 2. Diagram Illustrating the Different Messages of Posters (2)

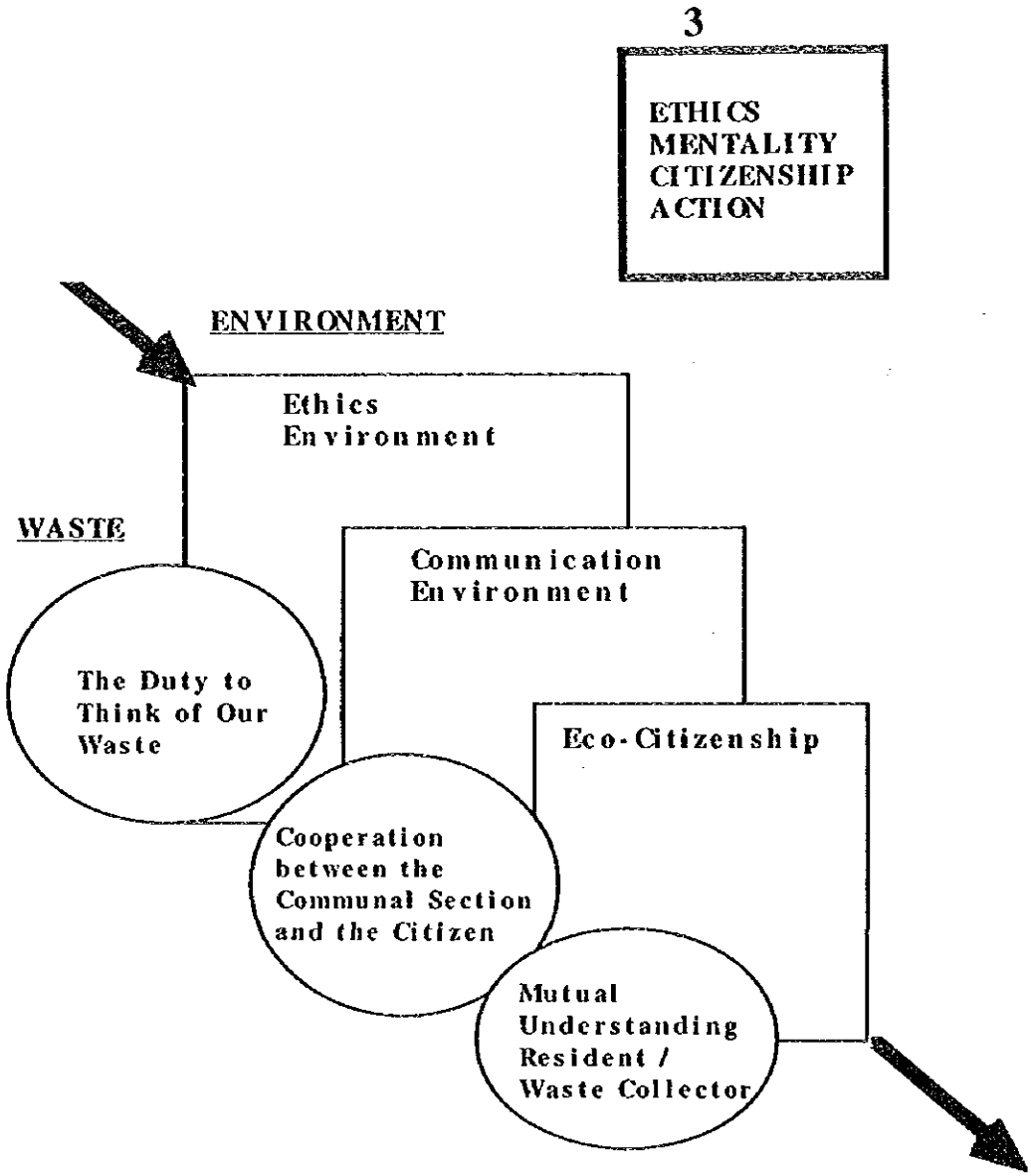

Fig. 3. Diagram Illustrating the Different Messages of Posters (3)

2 Summary of "Folder and Postcard" Project

2.1 Folder and Postcard Objectives

2.1.1 Folder

A periodic information about the efforts made to better manage the waste and control the nuisances is useful for communication between communes and residents. The folder is situated in this long-term prospect of a better communication between the population and communes. The aim of the folder is, in principle, the educated public, adults and children. It is this public that can profit better from the information presented in the folder.

The folder aims to:

- Be attached to a continuity procedure to keep the resident informed; this folder should be considered as the first element of a sequence;
- Complete the other awareness means by specified information; and more particularly to complete the posters messages;
- Inform residents in a synthetic way (multiple entries);
- Reinforce the coordination of the different parties concerned at the level of the necessary organization for conception, realization and distribution;
- Make the members of the committee contribute as far as possible to the accomplishment of the product, and the communes representatives as a priority.

2.1.2 Postcard

The importance of the postcard is to give a strong message, through the picture, that is within all the population's reach, whether wee-read, illiterate, adult or infantile. It is equivalent to the poster and has in addition a personal appropriation and a durability by "adoption" in the house. The aim is therefore the family unity.

The durability of this means and its periodic consultation are favored by the following factors:

- Insertion in a collection of picture and conservation in a box or a drawer;
- Possibility of being archived with letters;
- Wall decoration or on a desk.

2.2 Folder and Postcard Description

2.2.1 Folder Content and Format

The folder is a sheet of paper with a format of A4 wide and B4 long. It is folded into 3 parts according the Moroccan standard model (opening from the part on the right side). Printing is made on 170 g of glazed paper, by four-color printing of both sides. It is a format which is pleasing to the eye and practical, offering an appropriate communication space for quite detailed information.

The slogan that personalizes the folder on the first page is: "In Safi, we think of waste, we act against waste, we prepare for the future". The idea is to mobilize residents against the nuisances caused by waste not only to improve the present urban environment but also to ensure the quality of the future life. The awareness of this

principal dimension of the future has been considered as a additional motive for the dynamics against waste and for the great responsibility of residents.

2.2.2 Graphic and Textual Elements of the Folder

The folder includes different elements and tools of communication that are capable of affecting the awareness of the public:

- The drawing that already makes part of the 2nd series of standard posters;
- The messages carrying drawings: A series of eloquent drawings that complete the text by giving clear messages and balance the whole folder;
- Calligraphy: Some slogans have been prepared by a calligrapher;
- Text and data: This concerns the specific data to Safi in most cases. These data are generally derived from the study of JICA Study Team in Safi;
- Quotations and slogans of a religious, royal or political origin.

2.2.3 Technical Organization of the Folder

The 6 pages of the folder are used in the following way:

Recto:

- The presentation page: the drawing of the poster; the logo of the mascot; the slogan that gives the general tone of the folder;
- A reference page: A small glossary of waste;
- An information page in the form of an answer to 3 questions.

Verso:

- A page devoted to the role Communes and Urban Community with respect to waste management and the corresponding activities;
- A reflection page on the role that the resident can play in order to improve SWM;
- A central page concerning the basic principles of cleanliness and waste management according to sources that constitute an authority (religious judgments, extract from HM. the King's Letter addressed to the communes in 1996 and extracts from the National Strategy for Environment Protection and Sustainable Development).

A reduced copy of the folder will be proposed in the final report.

2.2.4 Postcard

The postcard presents a strong picture showing the city damaged by waste, which no one likes. It, therefore, concerns a very negative message that expects from the user a positive reaction by refusing such a situation and thus a reflection. The very artistic side of the drawing gives value to this product and expresses well the negative aspects of the message. A reduced illustration of the recto / verso postcard will be provided in the final report.

2.3 Materials Preparation

A work group has been constituted in order to prepare these materials. This concerned the direct involvement of the communes in the preparation of folders with an awareness objective. This objective has not been considered and the intervening parties of the work group have finally been the following:

- The National Education Delegation;
- The Youth and Sports Delegation;
- The Public Health Delegation;
- The ACL Association
- JICA.

The mounting of the folder has been presented as and when it is drawn up with the intervening parties in the program during the general meetings. Remarks have been taken into consideration in such a way to improve the mounting. The mounting has been presented to the Presidents and to the First Khalifat of the Governor for its finalization.

The postcard has been realized by combining the mascot of Safi and a child's drawing, realized within the framework of a competition of drawing at school. It has recompensed the best drawing among the 3 ones reserved for the realization of awareness materials.

2.4 Materials Distribution

2.4.1 Distributed Quantities

The number of folders has been evaluated by taking into consideration 2 factors:

- The higher rate of illiteracy in Safi;
- The time of distribution that rests on many years possibly.

The folder has been produced in 20.000 copies. The postcard has made the object of 50.000 copies. The quantities distributed are specified in Table 3.

Table 3 Inventory of Quantities for the Distribution of Folders and Postcards (as of February 21st)

	Folders (20000)	Postcards (50000)
Urban Community and Communes	2900	19800
Province	100	500
National Education Delegation	7000	10000
Public Health Delegation	5000	5000
Youth and Sports Delegation	1000	2000
Cultural Affairs Delegation	200	500
National Mutual Aid	1000	1000
ACL (Culture/Leisure Association)	2000	10000
Environment and Development Association	600	1000
JICA / ME	200	200
TOTAL	20000	50000

2.4.2 Distribution Means

The means of distribution have been made diversified in such a way to ensure an extended broadcasting. The following means have been considered:

- Distribution during the awareness activities such as the opening ceremony, the public display and video showing;
- Distribution in the different networks taken charge of by the provincial delegations; For example, the Delegation of Public Health ensures the distribution in health centers and hospitals. The Provincial Delegation of National Mutual Aid has joined with the committee of planning and execution of the program during the execution stage and on the committee members' request.
- Distribution in the different networks taken charge of by the associations.

The distribution network is presented in Table 4.

Table 4 Distribution System of Awareness Materials

	Distribution Network Elements
During awareness activities	Urban transportation, waste collection trucks, launching ceremony
Province	The Province center
National Education Delegation	The delegation center Primary and secondary schools (the 5th and 8th years)
Public Health Delegation	20 sanitary groups
Youth and Sports Delegation	The delegation center, 5 women's centers, 3 nursery schools, 4 youth club and arts centers, professional groups (hairdressing salons, typing, sewing, computer science, parties in power)
National Mutual Aid Delegation	7 centers of work education, 5 centers of social education, 1 Islamic Charitable Association, 1 children's home.
Cultural Affairs Delegation	The delegation center
ACL (Culture and Leisure Association)	The association center, EST, ISTA, maritime school, private schools, social service of the OCP
Environment and Development Association	The association activities

3. "School Activities" Project

3.1 Context and Objectives

The role of awareness at schools is very important thanks to the following reasons:

- To educate the society residents' mentality and attitude for the coming generation;
- To ensure the continuity of long-term education;
- To increase the awareness of adults through children.

Within the framework of the project, the school activities are those that are organized by the Provincial Delegation of National Education in coordination with the Urban Community. The objectives of the project of the increase of awareness at schools are the following:

- To make students and secondary schools participate in the preparation of awareness materials that are the educational notebook and the postcard;
- To create an appreciable relation with students between the public part and the academic part of the awareness project, especially by through materials (postcard), the public display of children's drawings and during the official ceremony of prize giving;
- To make students think of the problems of solid waste by a special lesson about the subject organized by teachers, on the one hand, and video showing, on the other;
- To make the chemistry course students of the technical secondary school participate in the activity of thinking about the scattered quantities of toxic waste.

The realization of these objectives is based on the preparation and the execution of the following steps:

- The competition of drawings;
- The preparation of the academic notebook;
- The pre-awareness of teachers;
- The video showing together with the distribution of postcards and folders.

3.2 Target Groups

The target groups are the following:

- Primary schools, 5th and 6th years (10 years old students);
- Secondary schools (11 secondary schools in Safi), 7th year (12 to 14 years old students);
- Technical secondary school, 3 classes of chemistry, about 40 students who are 16 years old.

The target groups that are classified according to the types of activities are the following:

- The competition of drawing : 7th years classes;
- The distribution of the educational notebook: 5th to 7th years classes;
- The distribution of postcards: 5th to 7th years classes;
- The video showing: 5th to 7th years classes;
- The increase of awareness concerning the toxic waste: chemistry class students.

3.3 Drawings Competition

The drawings competition has been aimed at students of the 7th classes representing 7 secondary schools in Safi city. The secondary schools, that have participated, are classified per secondary schools per commune in Table 5. In total, 380 children have participated in the competition and 336 drawings have been sent to the delegation.

The preparation of the competition has been made thanks to coordinating teachers who depend on the Office of Socio-Pedagogical, Cultural and Educational Activities. These teachers have organized awareness sessions for voluntary students in the competition. Each teacher has taken the initiative in increasing the awareness of students in his own way. The sessions have taken place at the beginning of December. They have been preceded by a meeting of the increase of awareness of teachers in the presence of JICA.

To make the competition easier and prepare the best conditions for the displaying of drawings with lesser price, pre-imprinted sheets of drawing paper with frame and identifying elements have been distributed to students.

Competition of Drawing, per Commune

Boudheb	Biada	Zaouia
1. Oued Eddahals 2. Idriss II	1. Al Fihriya 2. Moulay Youssef 3. A. Tayeb Benhima	1. Sidi Ouassel 2. Bir Inezarane

3.4 Drawings Selection and Prize Giving

The objective of the competition has been to select 3 drawings intended to serve as a fully-qualified means of communication (postcard) or to be integrated into one means (the students' notebook). The selection has been made by coordinating teachers, Socio-Pedagogical, Cultural and Educational Activities Office, and the JICA Study Team.

The recompense prize have been divided in the following way:

- 1st prize: Postcard (50.000 units);
- 2nd prize: Folder (20.000 units);
- 3rd prize: Educational notebook (10.000 units).

In addition to the awarded prizes, some fifty drawings have been reserved to be displayed in public and at schools.

The recompense prizes have been given to students with a double participation of JICA and the Delegation of National Education with the aim to recompense the first 3 prizes as well as a certain number of participants. Prizes giving has been organized within the delegation on January 29th, 1997 in the presence of the representative of the delegate of National Education, of the head of the Socio-Pedagogical, Cultural and Educational Activities Office, the coordinating teachers and of JICA Study Team. This has concerned the temporary prize giving for the first 3 prizes, having given that fact that the official prize giving had been planned according the activities starting ceremony.

3.5 Educational Notebook

3.5.1 Characteristics of the Notebook as a Means of Awareness

The point of the school notebook is to provide the student with a useful means that he can consult constantly in his daily life. The notebook cover constitutes the means used to pass on messages, pieces of information and data of reflection.

The advantages of the notebook as a means of communication are numerous:

- The student finds himself with a familiar material that makes part of his daily life and to which he can get used to easily;
- The fact of devoting the cover pages to printed drawings permits us to personalize the notebook, motivate the students and give them a very strong feeling of

appropriation. The play aspect of the cover of the notebook facilitates a personal use;

- The notebook has a certain durability in the student's life especially if it has a personalized use. The choice of classes for the distribution of notebooks has, moreover, been made by taking into consideration this criterion;
- The notebook does not go unnoticed at home. This, it is going to be aimed at the parents as well, either directly or through the dialogue between the child and adult.

3.5.2 Notebook Objectives

The objectives of the notebook are the following:

- To constitute an information tool about the municipal waste, in general;
- To arouse the interest of children under the control of teachers by giving them comparative data. The role of teachers is essential for the quality and significance of reflection;
- To provide behavior messages in a pleasing way.

3.5.3 Notebook Description

The educational notebook is meant to be used by children at schools. Its cover has been used as an awareness and information means. The cover recto pages are illustrated by using color and they propose visual messages on waste. The children's drawings have been printed on them. The verso pages are purely textual and they constitute the means of information to be used during the awareness lessons.

The notebook cover pages will be reproduced and translated in the final report. The verso pages are presented in the following way:

- A page of comparative data between 4 countries, namely Morocco, Tunisia, Japan and France;
- A reflection page on the problem of municipal waste in the form of questions. Messages of attitude are added.

The pieces of information give the required knowledge to take interest in these data. The international comparative approach permits us to better situate the case of Morocco, arouse curiosity and at the same time to show the situations diversity.

3.6 Increase of Secondary School Students' Awareness

3.6.1 Context

The secondary school students, who belong to scientific classes, use chemical products in loboratories. The waste of these products constitute problems of stocking, disposal and even of treatment since a part is put in containers before being collected by the commune to be disposed of in the dump site. The 3 chemical classes of the technical secondary school are the most directly concerned.

The Provincial Delegation of National Education has decided to take off from the demonstration project of public education in order to develop a project of the increase of awareness of secondary schools students of the topic of toxic waste.

This project permits the completion of other household waste awareness activities at schools in the following way:

- It aims at secondary schools at first;
- It has as an objective the increase of the students' awareness of toxic waste;
- It is an advisability to continue the awareness actions already undertaken;
- At long-term, this type of project create favorable conditions to consider an action of education.

This project can give the impression of the example of continuity of awareness actions that are developed at school thanks to the willingness of coordinators of the National Education Delegation. It can snowball and have a training effect in Safi or in relation to other communes of Morocco.

3.6.2 Objectives

The objective is to increase the students' awareness of the following aspects:

- The dangers and harmfulness associated with the substances used in the laboratory;
- The methods of security stocking;
- The risks related to the methods of discharge, especially the throwing of substances at sink or the collection of waste by the communes in order to discharge it in the disposal site;
- The sanitary and environmental problems posed by the waste of such substances.

3.6.3 Method

The point of the project is to increase the students' awareness in a series process by starting from chemistry, classes that come first, in the following way:

- The increase of the students' awareness of the problem of waste in general in the 3 chemistry classes of the technical secondary school by using the educational materials that are the folder, the notebook and the postcard;
- The increase of the students' awareness of specific problems of toxic waste in the 3 chemistry classes of the technical secondary school by using a pre-existent document described in section 3.6.6;
- The increase of the students' awareness of the specific problem of toxic waste in the other classes of secondary schools by using a document realized by the chemistry class students.

3.6.4 Project Stages

The project should be spread over many months on the initiative of National Education Delegation. It comprises the following stages:

- Planning and coordination in agreement with the teachers concerned and the administration (end of February 1997)
- Selection and the increase of awareness of the chemistry classes students interested in the project (Mach 1997);
- Animation of a research activity lead by students (March / April 1997);
- Preparation by students of a document or folder by taking into consideration the results of the their survey (April 1997);
- Increase of the awareness of students of general teaching secondary schools by using the folder prepared by students (May 1997).

3.6.5 Research/Survey Activity

The coordinators and teachers will guide students in order to make them realize a survey work. This will concern an inventory of the substances used, the state of stocking, the potential dangers related to stocking and to the method of discharge of substances.

3.6.6 Awareness Document

The document that will be used at first in the 3 chemistry classes of the technical secondary school is a document that has been created by the Regional Directorate of Energy and Environment, Rhone-Alpes region. It has been published for the secondary schools of the Rhone-Alpes region. This directorate has accepted to put at the students' disposal copies of this document within the framework of the awareness project of Safi..

The document gives a general and good presentation of the scattered quantities of toxic waste such as the case in one secondary school. The information provided by the document includes a glossary, a classification of substances, an illustration of the labeling of dangers and the harmfulness of substances, and recommendations of collection and stocking.

Beyond some general quantitative data that are specific to France, the document, in general, is well adapted to usage without particular geographical re-attachment. It corresponds perfectly to the objectives that the project coordinators devote themselves to.

4 "Video" Project

4.1 "Video" Project Context and Objectives

4.1.1 Video Cassette

The video cassette is not dependent of the public education demonstration project in Safi, but it completes it. The objective of the project is to have at the national level a modern and popular tool of awareness of solid waste. The video is co-produced by the Ministry of Environment and JICA.

The importance of producing a video can be explained by the following reasons:

- The video is a popular and effective means of awareness;
- It is a tool had been lacking in the existing set of means of awareness of solid waste topic in Morocco.

At first, the idea was to produce a video cassette to increase the public awareness of the problems of solid waste and its management. The project of making a film on public awareness has developed gradually and has extended to cover also the awareness of the municipal actors, namely engineers, technicians, and elected representatives. As a result, two films have been accomplished with different usages:

- A film for the general public use;
- A film for the communes use.

4.1.2 Video Projection

The projection of the video film is the basic activity for the organization of meetings between the communes and the public on the topic of waste. The video is therefore a medium that can directly induce the participation of the public, in the sense of the direct dialogue with the commune and other residents with a view to understand and solve certain problems of waste. This form of participation of important for making mentality and attitudes develop.

4.2 Video Film Accomplishment

The accomplishment of the video film has been made by a communication agency in Casablanca, which works regularly with the Ministry of Environment. The financing has been ensured by JICA budget.

4.3 Video Film Description

4.3.1 *General Description*

The style of the video film is documentary and pedagogical. The documentary is structured of many parts. It is accompanied by written information or explaining diagrams. The types of messages aimed at the target public are the following:

- Awareness messages about the problems of waste such as the public health or the potential environmental effects;
- Messages concerning the residents' behavior towards household waste;
- Recommendations concerning management, especially in terms of the control of disposal sites.

The information points are the following:

- What is solid waste;
- Who generates it;
- What is made of it (collection, recycling, treatment);
- Problems;
- What has been made to solve these problems;
- To present the difficulties with respect to the complexity of the intervening parties concerned;
- What can be improved if every one holds his responsibilities;
- The good actions by means of cleanliness.

4.3.2 Video Film for the General Public Use

The film which is meant to be used by the general public last for about 10 to 15 mn and it is composed of the following parts:

- Urban waste in Morocco;
- Waste collection;
- Recommendations concerning the residents' behavior.

4.3.3 Video Film for Municipalities Use

The time of this film is about 20 to 25 mn. It includes identical parts to those of the film aimed at the general public without recommendations about the residents' behavior. A great part of the film is devoted to the problems of waste disposal and to the technical recommendations for the improvement of disposal.

4.4 Video Films Showing

4.4.1 Showing Method

The video film showing is an essential stage for making out of the video a tool of communication and participation between the audience and the actors of awareness. The video can reach all the categories of the public and it has the advantage of making a connection between the different persons. The showing, however, should be animated and accompanied.

The animation of the video sessions has been ensured by the stimulating persons or coordinators of provincial delegations and by those of BMH in the case of communes. The available resources have been the following:

- National Education Delegation;
- Public Health Delegation;
- Municipal Hygiene Office (BMH);
- Youth and Sports Delegation;
- National Mutual Aid Delegation;
- Associations.

The accompaniment means the presence of waste actors, officials or elected representatives, during the projection. If the role of the stimulating person is to start and maintain the debate, that of the accompanist is to give precise information and favor the step of dialogue between the commune and residents. The accompanist is a cleanliness engineer, a collector, a technician of waste sector, or an elected representative.

4.4.2 Showing Places

The projection places of the video film during the awareness campaign have been the following:

- Enclosure of itinerary display on urban environment;
- Premises of the ACL association;
- Centers of Youth and Sports Delegation (women's centers, youth club and arts centers);
- Centers of Public Health Delegation;
- Centers of National Mutual Aid Delegation;
- Schools;
- Municipal libraries.

4.4.3 Showing Plans

The plans of showing include the dates and time of projections, places, the topics of discussion considered, the types of public expected, the names of stimulating persons and accompanists.

The plans of showing should be prepared by communes in coordination with delegations. These plans have finally been accomplished and then executed by delegations. The communes have brought their resource persons as accompanists. Pre-awareness of stimulating persons and accompanists as well as coordinators in the case of schools has been necessary.

The showing sessions, that have been planned, include different types of target public:

- Internal showing: Elected representatives, technicians, collectors;
- Intermediate showing: Stimulating persons, co-ordinators;
- External showing: The general public.

POSTERS

	NOVEMBER				DECEMBER				JANUARY				FEBRUARY				MARCH			
	1			15	1			15	1			15	1			15	1			15
HOLIDAYS																				
RAMADAN										10			10							
JICA TEAM	3					17						26					11			

Design

Competition of artists			18													9				
Registration time				20																
Mascot delivery time								9												
Delivery time of drawings for posters								9												
Formation of the jury					27															
Preselection by the artists																				
Selection of the mascot prize							12													
Selection of drawing prizes for posters							12													

Edition, printing, delivery

First meeting with printer				28																
Preparation of TOR			25				7													
Finalization of TOR								9												
Contract								10												
First payment / contract								10												
Order for printer									13											
Test for Urban Community and JICA										18										
Remarks of Urban Community and JICA											19									
Deadline for delivery												3								
Last payment															27	30				

Billposting

Selection and list of of sites					1			6												
Reservation of sites								7												
Order of easels (contract)									11											
Delivery of panels and easels												20								
Team and billposting material										16			20							
Billposting in 3 communes														10		17				
Billposting time															17					

FOLDERS

	NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	1	15	1	15	1	15	1	15	1	15
HOLIDAYS										
RAMADAN						10		10		
JICA TEAM	3			17			26		11	

Design

Preparation of messages / texts 25____3
Preparation of drawings 25____3
Selection of school drawing 13
Selection of the mascot 10
Preparation of mounting 25____6
Deadline for Remarks 11
Integration of drawings + mascot 13
Sample of complete mounting 16

Edition, printing, delivery

First meeting with printer 28
Preparation of TOR 25____7
Finalization of TOR 9
Contract 10
First payment / contract 10
Order for printer 16
Test for Urban Community and JICA 19
Remarks of Urban Community and JICA 19
Deadline for delivery 3
Last payment 27__30

Delivery

Delivery planning 25____29
Organisation of delivery 13
Delivery to distributors 15__17
Delivery to public 17_____

Appendix 1

SCHEDULE OF EDUCATION MATERIAL

POSTCARDS

	NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	1	15	1	15	1	15	1	15	1	15
HOLIDAYS										
RAMADAN					10		10			
JICA TEAM	3		17			26			11	

Design

Preparation of messages / texts 25____3
Preparation of drawings 25____3
Selection of school drawing 13
Selection of the mascot 10
Preparation of mounting 25____6
Integration of potential messages 13
Sample of complete mounting 16

Edition, printing, delivery

First meeting with printer 28
Preparation of TOR 25____7
Finalization of TOR 9
Contract 10
First payment / contract 10
Order for printer 16
Test for Urban Community and JICA 19
Remarks of Urban Community and JICA 19
Deadline for delivery 3
Last payment 27__30

Delivery

Delivery planning 25___29
Organization of delivery 15_____10
Delivery to distributors 15__17
Delivery to public 17_____

SCHOOL NOTEBOOKS

	NOVEMBER				DECEMBER				JANUARY				FEBRUARY				MARCH			
	1			15	1			15	1			15	1			15	1			15
HOLIDAYS																				
RAMADAN										10			10							
JICA TEAM	3					17						26						11		

Design

Preparation of messages / texts	25			3																
Preparation of drawings	25			3																
Selection of school drawing					13															
Selection of the mascot					10															
Preparation of mounting	25			6																
Deadline for remarks					9															
Integration of drawings + mascot					13															
Sample of complete mounting						16														

Edition, printing, delivery

First meeting with printer	28																			
Preparation of TOR	25			7																
Finalization of TOR					9															
Contract					10															
First payment / contract					10															
Order for printer						16														
Test for Urban Community and JICA						19														
Remarks of Urban Community and JICA						19														
Deadline for delivery									3											
Last payment												27	30							

Delivery / use

Delivery planning	25			29																
Organization of delivery									2			10								
Delivery to pupils												15				20				
Animation meeting of notebooks												15				20				

Appendix 1

SCHOOL ACTIVITIES

(Delegation of Education)

	NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	1	15	1	15	1	15	1	15	1	15
HOLIDAYS										
RAMADAN					10		10			
JICA TEAM	3		17			26			11	

Education of school teachers
Presentation of the video 29

Education of pupils
Presentation of the video to pupils / drawing 5/6
Presentation of the video to representatives of the classes 18___20
Education day with notebooks 15___20
Presentation of the video to pupils 20_____7

Drawing competition
Launching the competition 5/6
Competition time 5/6___12
Handing out of drawings and meeting of the jury 12
Selection of drawing 13

Exhibition of drawings
Public exhibition 17_____3
School exhibition 4_____18

Prizes awarding
Prize awarding ceremony 17/18

Delivery of notebooks 15___20

EXHIBITIONS AND CEREMONIES

	NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	1	15	1	15	1	15	1	15	1	15
HOLIDAYS										
RAMADAN					10		10			
JICA TEAM	3			17		26			11	

Opening ceremony of exhibition

Organisation with MOE	2___6
Preparation of the ceremony	2___6
Selection of the site	5/6
Ceremony	17/18

Public exhibition

Organisation with MOE	20___2
Preparation of itinerant exhibition	20_____6
Preparation of drawing exhibition	6_____13
Selection of the site	6
Exhibition time	17_____3

School exhibition

Preparation of exhibition place	20___24
School exhibition	4_____18

Appendix 1

VIEWING OF VIDEO FILM

	NOVEMBER				DECEMBER				JANUARY				FEBRUARY				MARCH			
	1			15	1			15	1			15	1			15	1			15
HOLIDAYS																				
RAMADAN										10			10							
JICA TEAM	3					17						26					11			

Internal video viewing
(Elected representatives, technicians, waste collectors)
Viewing plan 25___6
Education of the technicians 7__9
Education of the Municipal councillors 7__9
Education of waste collectors 7__9

Intermediate video viewing
(Education of animators)
Viewing plan 25___6
Viewing in favor of BMH doctors 13___17
Viewing in favor of Health animators 13___17
Viewing in favor of Youth and Sports animators 13___17

External video viewing
(Education of the general public)
Viewing plan 25___6
Planning of places and dates of presentation 25___6
Programme definition 9___13
Meetings / viewing 18_____4

Video viewing in school activity
(see school activities)

ACTIVITIES EVALUATION

	NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	1	15	1	15	1	15	1	15	1	15
HOLIDAYS										
RAMADAN					10		10			
JICA TEAM	3		17			26			11	

Preparation
Questionnaire 25__30
(a) results of the questionnaire 2___6

Participation rate
Control of entry to exhibition 18_____3
Participation in competitions (results) 11___13

Opinion survey in exhibition
Questionnaire 10_____16
Formation of interviewing team 28/29
survey 1__3
(c) Survey results 4

Opinion survey for inhabitants
Questionnaire 10_____16
Interviewing team 28/29
Survey 10___14
(b) Results 17

Interpretation of results
Comparison of (a) and (b) 17__20
Comparison with (c) 17__20
Participation results 17__20
Participation rate 17__20

Appendix 1