

Chapter 9

Conclusions and Recommendations

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9.1 Conclusions

This Study covers 14 municipalities in the San Salvador Metropolitan Area (AMSS) that constitute the COAMSS/OPAMSS. Whereas dimensions of respective municipalities such as population, municipal budget are diverse, for example the average household income ranges from Tonacatepeque's 32,000 colons/household/year to San Salvador's 150,000 colons/household/year. Municipal financial capability for SWM services also widely different among 14 municipalities, accordingly SWM service coverage also differs among them from only about 52% coverage to 95% coverage.

In face of diversely different status quo of respective municipalities, the M/P attempted to sort out outstanding problems into "metropolitan focus" issues and "individual municipal focus" issues, and accordingly formulated workable plans and projects in order to solve respective issues.

With respect to environmental requirements, since the Special Regulation on Integral Solid Waste Management (Reglamento Especial sobre el Manejo Integral de los Desechos Sólidos) was published on 1st June 2000, its compliance becomes necessary in formulating the M/P. Namely, it is required for final disposal sites to equip impermeable liner, to drain and treat leachate and to implement sanitary landfill.

As for the status quo of the collection and transport, municipalities whose final disposal site is at distant place carry out direct transport by collection vehicles. Which consequently lowers efficiency of collection/transport activities and shortens the service life of the vehicles. Furthermore, collection routes are mostly decided by drivers' experience. Namely they are not technically assessed. Hence, generally speaking, it resulted in low efficiency of cleansing activities in AMSS.

Great majority of collection vehicles working in AMSS is what donated by Japanese government in 1989 and 1996 whose service lives are ending in a near future. As the El Salvador makes stable economic growth recently, it will not be expected that another Japanese donation of vehicles take place. Therefore, it is required that the Salvadoran side by themselves should procure collection vehicles to replace old ones by their own efforts.

Hurdles necessary to get over such as compliance with the newly published environmental legislation and self-procurement of collection vehicles would have to be considered as a proof that El Salvador is growing to a middle income country. Therefore, it still more requires self-help efforts by the Salvadoran authorities and officials concerned with SWM services and citizens, in order to continue advancing and solve these problems.

Under such circumstances, the Study analyzes the current situation of SWM in 14 municipalities in AMSS and formulated the M/P that aims to:

- promote the citizens' well-being and public health;
- implement sustainable SWM; and

- contribute to environmental conservation.

Now, it is awaited to solve a set of problems by executing the SWM services in line with the M/P (namely to execute plans and implement projects proposed in the M/P).

In view of the financial aspects, to expand service coverage and to implement sanitary landfill will inevitably increase the cost burden of municipalities even though series of improvement in cleansing works efficiency takes place. However, if fee collection efficiency is raised and the specific duty system is applied for large dischargers, several municipalities can make the total balance (2001-2010) of SWM revenue/expenditure positive. On the other hand some municipalities are required to raise the fees to be paid by dischargers in addition to the above measures in order to make the total balance (2001-2010) of SWM revenue/expenditure not negative.

As a consequence, if the M/P is implemented, in realizing efficient collection and transport by operating T/S&T, in solving the problems of vehicle replacement and sanitary landfills, total saving of 96million colons expenditure can be made during 2001 to 2010 as a whole (i.e. 14 municipalities).

Apart from financial aspects, Salvadoran side should accomplish important missions such as technical institutional and administrative strengthening. In practice, human resource development and administrative consolidation for SWM (not only individual municipal consolidation but also collective improvement through UE-COAMSS) now become indispensable.

El Salvador, having steady growth of its economy, now can not expect the grant-aid scheme of Japanese government. However, technical cooperation scheme of Japanese government (e.g., dispatch of JICA expert) or of other international agencies are available to support the above mentioned missions such as human resource development.

9.2 Recommendations

9.2.1 Study Continuity

This development study (The Study on Regional Solid Waste Management for San Salvador Metropolitan Area in the Republic of El Salvador), under the JICA's technical cooperation program, will be finalized and ended when the Final Report of the Study is submitted to the Salvadoran side around November 2000. The solid waste management M/P is to be implemented by the Salvadoran side. If the M/P is not implemented, it means that all time and resources devoted to the study result in vain. Furthermore, benefits such as "promotions of citizens' well-being and public health", "implementation of sustainable SWM" and "contribution to environmental conservation" expected in the M/P will not be attained. Therefore, the study team strongly recommends that the M/P and its plans and projects should be implemented.

From now, it is necessary for the Salvadoran side to procure technical and financial resources etc. in order to implement the M/P. The M/P is formulated in due consideration of the Salvadoran's technical capability and financial affordability for the SWM, therefore, they can be considered to be ready for implementation.

In order to avoid this study suffering from an unproductive ending of non-implementation of the M/P, efforts should be made by the Salvadoran side to

create such circumstances that the plans and projects recommended in the M/P can be continuously followed and promoted. In practice, it is recommended that the Salvadoran side should make a request of technical cooperation to JICA and/or other international cooperation agency for the follow-up and implementation of M/P projects.

Dispatch of JICA expert, which is another JICA's technical cooperation scheme, is opportune to provide such an expert with least to none cost burden on the counterpart institution.

9.2.2 Compilation and Utilization of Data

It is recommended that data and information regarding such as "waste stream" should be systematically be measured, compiled and utilized every year in order to follow and verify what are assumed and planned in the M/P. Such compiled data and information will be extremely important to review and modify the M/P when in future it becomes necessary. At the same time, annual trends in respective SWM particulars can then be actually understood. Such data will possibly suggest a key for upgrading the SWM system of the AMSS.

9.2.3 Collection Route Improvement

Collection routes in most municipalities are decided based on the empirical judgement of collection vehicle drivers or they are not reviewed carefully. Therefore, under-capacity or over-capacity waste loading is usual and chronic in AMSS. It consequently introduces lowered collection efficiency and service life shortened by unnecessary breakdowns of collection vehicles (mainly by overload).

The Study's pilot project of collection route improvement verified that the efficiency of collection works can be improved by appropriate vehicle allocation that should be brought out by collection route improvement practices. Since the Study produced the Manual for Collection Route Improvement, this should like to be utilized fully for such improvement practices by respective municipal officers by themselves.

9.2.4 Transfer Stations and Trailer Transport

All 14 municipalities currently carry out the direct transport by collection vehicle that is for a fairly long distance for many municipalities. It is recommended to have T/S and trailer transport system in order to realize efficient collection and transport activities and to prolong the service life of collection vehicles. Transfer stations should be localized at optimum locations to attain the cost-effective SWM activities and environmental benefits.

9.2.5 Administration of SWM Services

The Study recommends institutional improvement measures for the administration of SWM service. It recommends for the San Salvador municipality to create the San Salvador Municipal Public Company of Urban Cleansing (EMAUSS), in order to provide SWM services that are more competitive and efficient.

The Study also proposes that Execution Unit of SWM of OPAMSS (UE-OPAMMS) in order to support other 13 municipalities in technical and administrative improvement of respective SWM services.

9.2.6 Independent Accounting

All municipalities other than San Salvador municipality do not make clear distinction between SWM accounting and other accountings of municipality. Therefore, the revenue/expenditure balance of SWM services remains unclear and its feedback to operational activity improvement does not take place. In order to execute sustainable and competitive SWM services, it is recommended that accounting of SWM services should make independent of the municipal general accounting.

9.2.7 SWM Fees Collection

It is appreciable that the current joint billing of SWM fees with electricity charge for households is an effective collection system, however, it is anticipated that reasonable fee rates are not charged for large commercial/institutions dischargers.

In order to realize the sustainable SWM services, it is necessary to establish and facilitate such a fee structure and collection system that fee fairly corresponding as a consideration of the service provided is to be charged and collected.

Therefore, it is recommended to improve the fee collection efficiency for household users and to apply the specific duty system (fee in proportion to waste quantity) for large-scale dischargers.