10.2.3 Financial Plan

The SWM cost, which is sum of the current SWM cost and Action Plan cost (increased cost), and total own revenue, which is sum of actual revenue and projected revenue increase, are summarized as shown in Table 10.2-7.

Table 10.2-7 Ratios of SWM Cost to Municipality Own Revenue (million Rs)

City	Items	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	Total
KMC	I. Own Revenue	559	595	633	661	693	694	684	673	663	652	6,505
	II. SWM Cost	174	209	180	174	209	183	173	183	179	172	1,835
	III. Ratio (= II/I)	31%	35%	28%	26%	30%	26%	25%	27%	27%	26%	28%
LSMC	I. Own Revenue	120	127	134	139	145	145	142	139	136	133	1,358
	II. SWM Cost	27	50	41	45	44	46	44	51	47	48	442
	III. Ratio (= II/I)	22%	39%	31%	32%	30%	31%	31%	37%	34%	36%	33%
BKM	I. Own Revenue	127	128	129	129	129	128	127	125	125	121	1,269
	II. SWM Cost	59	45	41	27	28	27	31	43	24	24	348
	III. Ratio (= II/I)	46%	35%	31%	21%	21%	21%	24%	34%	19%	20%	27%
MTM	I. Own Revenue	18	19	20	21	21	21	20	19	19	18	195
	II. SWM Cost	2	14	7	7	6	6	6	12	7	7	73
	III. Ratio (= II/I)	11%	73%	33%	34%	27%	28%	31%	64%	35%	39%	37%
KRM	I. Own Revenue	18	19	20	20	21	20	19	18	17	16	189
	II. SWM Cost	1	3	2	2	2	3	2	3	2	2	23
	III. Ratio (= II/I)	7%	16%	9%	11%	10%	12%	11%	17%	13%	15%	12%

Note: Own revenue of each municipality is projected based on revenue increase consists of Local Development Fee, Gov. subsidy and Property Tax
Source: JICA Study Team

The ratio of total SWM cost to total own revenue result is 28% for KMC, 33% for LSMC, 27% for BKM, 37% for MTM and 12% for KRM, respectively. These ratios are higher than current ratios in all municipalities. However, as SWM should be ranked as a priority service of the municipality, it is suggested that the municipalities are expected to bear entire Action Plan costs by taking all means available, for instance by reducing other expenditures, or applying for a subsidy from the Reserved Fund, in addition to revenue improvement, to cope with growing demand for SWM services delivery.

10.3 Action Plan of SWMRMC

10.3.1 Action Plan

In addition to each municipality, an A/P for SWMRMC has been prepared based on the suggestions by the JICA Study Team and discussions among the relevant organizations at the Board of SWMRMC as well as at the TWG meetings. Two kinds of A/Ps have been developed. One is for organizational and institutional arrangement so that SWMRMC could become a "Solid Waste Management Technical Center (tentative name)", and the other is for actual implementation of necessary activities under the umbrella concept (development of sanitary landfill sites and waste processing plant in the Kathmandu Valley). The developed A/Ps are summarized in Table 10.3-1 and -2.

Table 10.3-1 Action Plan of SWMRMC (for Organizational and Institutional Development)

Related main issues to be tackled	Necessary Activities		
	Short-term (2005/06-2007/08) (2062 Shrawana -2065 Ashadha)	Mid-term (2008/09-2010/11) (2065 Shrawana -2068 Ashadha)	Long-term (2011/12-2014/15) (2068 Shrawana -2072 Ashadha)
- Unclear demarcation of responsibilities between SWMRMC and Local Bodies (LBs) - Unclear relation with MOLD (status of SWMRMC) - Limited jurisdictional area (inside the Kathmandu Valley) - Lack of skilled manpower - Lack of equipment and facility	S1: Clarification of demarcation between SWMRMC and Local Bodies by issuing a new policy and amendment of the Solid Waste Act S2: Clarification of legal status and change of jurisdictional area by amendment of the Act S3: Establishment of a strategic plan for SWMRMC (future organizational and institutional development plan) S4: Chang of name and organization (such as setting up environmental section, training section, etc.) S5: Recruitment of skilled personnel and reservation of resource persons (inc. training) S6: Procurement of basic equipment (computer, software, etc.) and facility (including arrangement of office building, training room) S7: Implementation of Public Relations (PRs) activities (development of web-site and issues of newsletter, etc.) S8: Implementation of studies and research (waste minimization technology, final disposal sites selection) as part of training	M1: Continuous recruitment of skilled personnel and reservation of resource person (inc. training) M2: Continuous procurement of equipment and facility (mainly for training implementation) M3: Implementation of PRs activities (usage of web-site and issues of newsletter, etc.) M4: Starting training program to LBs and NGOs/CBOs M5: Preparation of a subsidy system to LBs (including setting up relevant section) M6: Preparation of public participation/community mobilization (including setting up relevant section) M7: Preparation of establishment of information network for SWM (including setting up relevant section) M8: Continuous implementation of study and research on waste minimization (as part of training) M9: Implementation of necessary support to LBs	L1: Continuous recruitment of skilled personnel and reservation of resource person (inc. training) L2: Continuous procurement of equipment and facility (mainly for information network) L3: Implementation of PRs activities (usage of web-site and issues of newsletter, etc.) L4: Implementation of training program to LBs and NGOs/CBOs L5: Implementation of a subsidy system L6: Implementation of public participation/community mobilization activities L7: Utilization of information network of SWM L8: Continuous implementation of study and research on waste minimization and final disposal L9: Implementation of necessary support to LBs

Table 10.3-2 Action Plan of SWMRMC (for SWM Facilities Development)

Related main issues to be tackled	Necessary Activities		
	Short-term (2005/06-2007/08) (2062 Shrawana -2065 Ashadha)	Mid-term (2008/09-2010/11) (2065 Shrawana -2068 Ashadha)	Long-term (2011/12-2014/15) (2068 Shrawana -2072 Ashadha)
- Need of long-term sanitary landfill sites - Need of large scale waste processing plant - Safety closure of existing dumping sites and used landfill site	S1: Development of Sisdol Short-term LF S1-1: Development of Sisdol LF Valley II (2005/06) S1-2: Handover Valley II to operator S1-3: Periodic environmental monitoring S2: Development of Waste Processing Facility (KMC. LSMC, KRM) S2-3: Land selection and assessment S2-4: Site investigation works S2-5: Land acquisition S2-6: Concept design and Feasibility study S2-7: EIA process S2-8: Detailed design S2-9: Landfill development of Phase I S2-10: Handover site to operator S2-11: Periodic environmental monitoring S3: Development of Long-term LF (KMC, LSMC, KRM) S3-1: Construction of the access road S3-2: Identification of the capacity S3-3: Site investigation works S3-4: Land acquisition S3-5: Concept design S3-6: EIA process S3-7: Detailed design S3-8: Landfill development of Phase 1 S3-9: Handover site to operator S3-10: Periodic environmental monitoring	M1-1: Receiving Sisdol site from operators M1-2: Regular environmental monitoring of closed Sisdol site M1-3: Maintenance and repairs for closed Sisdol site M2-1: Periodic environmental monitoring M2-2: Development of Phase II M3-1: Periodic environmental monitoring M3-2: Development of Phase II M4-1: Regular environmental monitoring	L1-1: Regular environmental monitoring L1-2: Maintenance and repairs for closed Sisdol site L2-1: Periodic environmental monitoring L2-2: Development of Phase III L3-1: Periodic environmental monitoring L3-2: Development of Phase III L4-1: Regular environmental monitoring

Related main issues to be tackled	Necessary Activities		
	Short-term (2005/06-2007/08) (2062 Shrawana -2065 Ashadha)	**Mid-term (2008/09-2010/11) (2065 Shrawana -2068 Ashadha)**	**Long-term (2011/12-2014/15) (2068 Shrawana -2072 Ashadha)**
	S4: Development of Long-term LF (BKM, MTM) S4-1: Site investigation works (EIA, Topography survey, Soil investigation) S4-2: Land acquisition S4-3: Detailed design S4-4: Development of Phase I S4-5: Handover Phase I to operator S4-6: Periodic environmental monitoring S5: Closure of Bagmati River dumping site S5-1: Design of Bagmati River dumping site closure plan S5-2: Implementation of Bagmati closure plan S5-3: Regular environmental monitoring		

10.3.2 Financial Plan

SWMRMC as the Central Government is expected to be required to be burdened with necessary costs for development of landfills, transfer stations, waste processing facility (WPF) and closures of landfills. On the other hand, in principle, municipalities should bear the rest of the costs from their own revenues, that is, equipment procurement and incremental O&M costs.

Consequently, SWMRMC's financial burden is estimated at Rs 1,419 million in total as shown in Table 10.3-3 that consists of Rs.65 million for transfer stations, Rs.242 million for WPF and Rs 1,112 for landfills.

Table 10.3-3 Projected Facilities Development Costs to be borne by SWMRMC (million Rs)

Area	Facility	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	Total
Zone A	T/S	65.8										65.8
	WPF	14.3	146.4		41.9				1.2			203.8
	LF	34.8	649.1	120.2	32.9	55.3						892.4
	Total	114.9	795.5	120.2	74.8	55.3	0	0	1.2	0	0	1,162.0
Zone B	T/S											0
	WPF	38.2										38.2
	LF	218.1	0.4	0.3								218.8
	Total	256.3	0.4	0.3	0	0	0	0	0	0	0	257.0
Total	T/S	65.8										**65.8**
	WPF	52.5	146.4		41.9				1.2			**242.0**
	LF	252.9	649.5	120.5	32.9	55.3						**1,111.2**
	Total	**371.2**	**795.9**	**120.5**	**74.8**	**55.3**	**0**	**0**	**1.2**	**0**	**0**	**1,419.0**

Source: JICA Study Team

10.4 Monitoring and Evaluation Plan for Action Plans

The A/P is a long-term strategic plan to be implemented starting fiscal year 2005/06 (2062/63) to 2014/15 (2071/2072). In order to ensure that the Action Plan is implemented in an effective and sustainable manner, monitoring and evaluation systems need to be put in place that bind together both individual and collective achievements of SWMRMC and the five municipalities. Such systems should be installed both at the municipal level, as well as the Valley level, in line with the institutional arrangements as discussed under the Umbrella Concept.

In the case of the A/Ps, OVIs were identified with target for the year 2015. Through the implementation of the A/Ps, collectively, the municipalities and SWMRMC will aim to increase the total solid waste management rate from existing 76% to 93%. Each municipality's target, solid waste management ratio, is as specified within the respective A/Ps.

Monitoring: Monitoring of A/P implementation should be conducted at two levels. First, the solid waste management ratio should be calculated at individual municipalities, to measure the effectiveness of SWM activities as indicated in the targets of the respective A/Ps. It is suggested that each municipality's benchmark the target solid waste management ratio that they should achieve by the end of short, medium and long term activities of the A/Ps.

Every three or four years, the actual percentage of the solid waste management rate should be measured against the benchmarked target ratio to assess progress.

The second level of monitoring of the A/Ps should be conducted when each municipality formulate their respective annual work plans, which in fact is a breakdown of activities as identified for short, medium, and long term. Based on the existing policy priorities, availability of resources, influences from external factors, and lessons learned from the past implementation of activities, the contents of A/Ps themselves should be reviewed and modified. This process should allow enough flexibility so that the activities stipulated in the A/Ps could be changed, dropped or added insofar as the overall effect of the SWM program would increase the solid waste management ratio. Furthermore, this exercise would serve to update the A/Ps so that it would enhance the relevance of the A/Ps for continued sustainability. The linkage between the Action Plan monitoring system and Annual Work Plan is as illustrated in Figure 10.4-1.

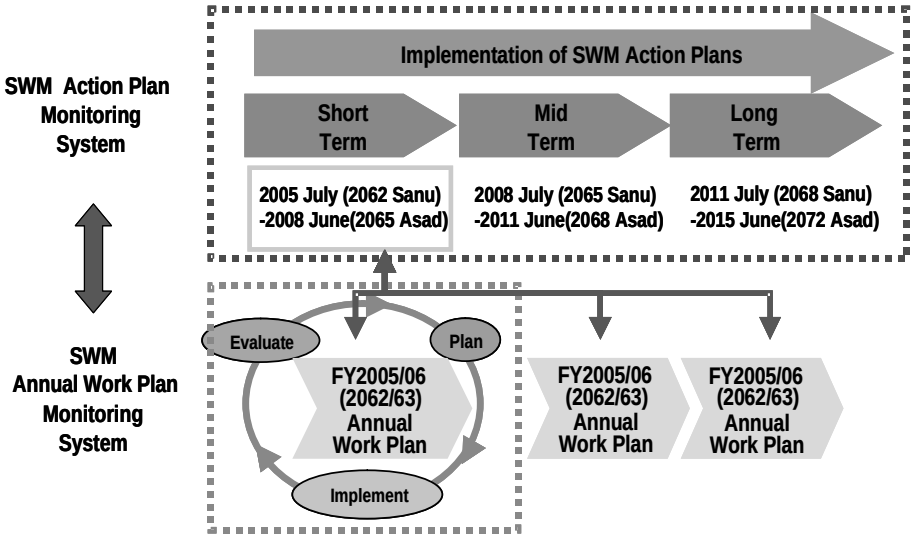


Figure 10.4-1 Linkage between Action Plan Monitoring System and Annual Work Plan

Source: JICA Study Team

Evaluation: During the benchmarked years of 2008 and 2011, which are also the final fiscal years within short and mid terms, respectively, end of term evaluations are recommended to holistically review the A/Ps implementation from the perspectives such as relevance, effectiveness, efficiency, impact and sustainability of municipal activities. In 2015, the final evaluation should be conducted to examine whether the ultimate target of 93% solid waste management ratio was achieved, and to draw best practices and lessons learned for future SWM programs.

For the end of term evaluations, it is envisaged that a joint evaluation team be formed for each municipality among the representatives from municipal T/Fs, SWMRMC, and MOLD. The results of the evaluations should be disclosed and shared with other municipalities at TWG and other forums so that the major lessons learned and recommendations could be shared with a wider audience.

CHAPTER 11 PRELIMINARY ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

11.1 EIA System of Nepal

The legal framework covering Environmental Impact Assessment (EIA) in Nepal is basically composed of the Environmental Protection Act and the Environmental Protection Rules, 1997 (Act/Rules), which stipulate the requirements for IEE/EIA in the SWM sector as shown Table 11.1-1.

Table 11.1-1 IEE/EIA Requirement in the SWM Sector in Nepal

Project type and activity		Size/capacity requiring IEE	Size/capacity requiring EIA
1	SWM activities[*1]	Population under service: 2,000~10,000	Population under service: More than 10,000
2	Landfill	Receiving waste: 100~1,000 ton/year	Receiving waste: More than 1,000 ton/year Population under service in urban area: More than 10,000
3	Transfer station and resource recovery	Area: Not more than 3 ha	Area: More than 3 ha
4	Facility for selecting, picking, disposing, and recycling through chemical, mechanical or biological techniques	Area: Not more than 2 ha	Area: More than 2 ha
5	Compost plant	Area: 1-5 ha	Area: More than 5 ha
6	Construction of waste plant, recovery plant, landfill site, storing facility and treatment facility for hazardous waste	-	Any scale
7	Final disposal of infectious waste	-	Hospital, health center, etc.: More than 25 beds
8	Incinerating or recycling any lethal substances	-	Area: More than 1 ha

Note: *1 Although there is no legal definition in EPA/EPR in terms of SWM-related activities, it can be technically said to include waste collection, transportation, processing, final disposal and any combination of them, according to the reply of MOEST to the inquiry from JICA Study Team.
Source: Environmental Protection Act, 1997, and Environmental Protection Rules, 1997, HMG Nepal

The project proponent should obtain the approval from the Ministry of Environment, Science and Technology (MOEST) in the case of EIA, and from the concerned agency (superior ministry) in the case of IEE. The IEE/EIA process including the public involvement is also provided in the Act/Rules.

Also, SWMRMC established EIA Guidelines for Solid Waste Management Projects in the Municipalities of Nepal (SWMRMC EIA Guidelines) in 2004, which cover the technical and procedural issues of IEE/EIA in the municipal SWM sector.

11.2 Overview of Land Acquisition and Resettlement System in Nepal

A legal framework for land acquisition and resettlement in Nepal is mainly formed by the Land Acquisition Act 1961 (amended in 1977) and Land Acquisition Rules 1969, which provide a formal procedure for acquisition of and compensation for privately owned property

acquired for public purposes and works. In the course of the procedure, a compensation determination committee is generally organized at the district level involving a land administration/revenue office, the project proponent, and a representative of the district from the public, in order to perform and supervise key activities or steps. Any resettlement or relocation is practically operated in the conceptual framework of land acquisition and compensation.

11.3 Consistency with the JICA Guidelines

Based on the requirements of the Guidelines for Environmental and Social Considerations of JICA (JICA Guidelines), Table 11.3-1 shows the consistency of the Nepalese IEE/EIA system and/or experiences in SWM-sector projects with the JICA Guidelines. It can be said that the Nepalese system and experiences on environmental and social considerations fulfill the JICA Guideline requirements more or less.

Table 11.3-1 Comparison between Nepalese EIA System and JICA Guidelines

Requirements/key points of JICA Guidelines	Nepalese system and experience in SWM-sector projects
Integration of environmental and social considerations into planning and decision-making process	- There is no system specific for the SWM sector. However, public involvement is provided by EPA/EPR in the scoping stage of EIA (15-day public notice) - SWMRMC EIA Guidelines point out the importance of stakeholder involvement from an early stage of project planning as much as possible.
Openness of EIA-related documents in understandable language	- EIA-related documents are basically prepared in English in order to make their contents clear technically. At a practical level, a summarized document in the local language (Nepali) is usually prepared for public notice/hearing.
Categorization of the proposed project	- EPA/EPR provides criteria for categorization of the project of various sectors including the SWM sector, based on the project type and scale.
Examination of various impacts and measures	- EPA/EPR provides the general scope for examination of impacts and measures, such as physical, biological and social-economic aspects. Alternative analysis is also considered in EPA/EPR. - SWMRMC EIA Guidelines cover the various environmental and social elements to be examined. Technical instruction for examining the impacts and measures is provided in line with the project type in the SWM sector.
Information disclosure and stakeholder consultation	- EPA/EPR stipulates that opportunities be provided to stakeholders especially for local communities/people (public notice, public hearing, etc.). - At a practical level, MOEST sometimes requests the project proponent to attach a letter from local communities or other key stakeholders, in order to show the general acceptance toward the project. - Recently there has been a tendency to organize a local coordination committee for LFS development in order not only to ensure the stakeholder involvement but also to have good mutual understanding.
Consideration for socially vulnerable groups, involuntary resettlement, etc.	- IEE/EIA covers the ethnicity, caste, poverty status, etc. as one of the socio-economic aspects. - There is no system specifically for involuntary resettlement. However, the legal system for land acquisition and compensation is enacted separately from the IEE/EIA system.
Monitoring after project implementation	- EPA/EPR stipulates that a monitoring plan be included in IEE/EIA. - SWMRMC EIA Guidelines provide technical instruction for establishing the monitoring plan.

Source: JICA Study Team, referring to Environmental Protection Act, 1997 and Rules, 1997 (HMG Nepal), and to EIA Guidelines for Solid Waste Management Project, SWMRMC, 2004.

11.4 Result of Preliminary Environmental and Social Considerations

Among various activities in A/Ps, the activities associated with facility development are selected as the projects necessary for preliminary IEE. Based on its result, the following are proposed for necessary actions to be performed by the Nepalese side.

- A official IEE or EIA stipulated in Nepalese legislation should be complied with according to the characteristics and scale of projects/activities.
- It is essential to have a continuous stakeholder involvement and discussion in the various stages of the A/Ps' activities in order to have mutual understanding and acceptance for achieving good practice using the capability and skills obtained in the course of the Study.
- Environmental pollution especially of water quality and odor should be reduced as much as possible through mitigation measures, which are to be examined in every project stage. Environmental monitoring is also essential.
- Every effort is to be made to avoid or minimize involuntary resettlement and land acquisition in the planning and designing stage wherever possible. If inevitable, appropriate compensation should be provided in line with Nepalese legal requirements.
- Due consideration should be given to the waste pickers, such as i) mitigation against probable reduction of the opportunities for waste picking activities due to the A/Ps implementation, ii) improvement of safety condition at the working areas, iii) reduction of risk of infectious health hazards due to the medical waste, and iv) improvement of social status e.g. employment of waste pickers as workers at the SWM-related facilities in the long run.

Table 11.4-1 depicts the key and suggested issues proposed specifically for each major facility under A/Ps.

Table 11.4-1 Suggestive Issues for Major Facilities Development

Facility	Key or suggested issues
Balaju T/S	- IEE will be prerequisite according to Nepalese legislation. - It is suggested that access road maintenance, speed limit and heavy equipment maintenance be provided to reduce the impact of air pollution and noise. - In order to reduce the impact of odor, it is proposed to examine i) the effective unloading/loading work of waste handling, and ii) platform cleaning and drainage management. Regular or ad hoc observation of the odor condition is also suggested in and around the site.
Waste Processing Facility (WPF)	- EIA will be prerequisite according to Nepalese legislation. - It is suggested that access road maintenance, speed limit and heavy equipment maintenance be provided to reduce the impact of air pollution and noise. - It is suggested to install a drainage system associated with small-scale treatment against water pollution. - In order to reduce the impact of odor, it is proposed to examine i) appropriate location in the site selection process, ii) the house-structural design of the working yard, iii) installation of buffer zone, and iv) yard cleaning and drainage management. Regular or ad hoc observation of the odor condition is also suggested in and around the site. - After the site is determined, the impact on the ecosystem is to be identified, and mitigation measures are to be examined if necessary. - It is proposed to avoid the cultural heritage or religious areas as much as possible in the site selection process.
Banchare Danda L/T-LFS	- EIA will be a prerequisite according to Nepalese legislation. - It is suggested that access road maintenance, speed limit and heavy equipment maintenance be provided to reduce the impact of air pollution and noise. - A gas ventilation system is to be planned and equipped in the landfill area for proper

Facility	Key or suggested issues
	release of landfill gas. Regular monitoring of gas is also suggested. - A leachate control system is essential in order not to flow the leachate to outside of the site. A retention and recirculation facility associated with aeration of the leachate, which is functioning at Sisdol S/T-LF, is applicable and recommended. - In order to reduce the percolation of the leachate to the groundwater, it is recommended to install a liner system on the bottom of the landfill area. Geo-membrane placing is preferable when applicable, but when inapplicable clay liner is to be employed at least in the same manner as at Sisdol S/T-LF. - A peripheral drainage system is to be designed and equipped for isolation of storm water runoff from the outside of the site. - Regular monitoring of river water, groundwater and leachate is essential. - In order to reduce the impact of odor, it is proposed to carry out soil cover regularly. Regular or ad hoc observation of the odor condition is also suggested in and around the site. - River diversion work is a prerequisite with considering the river morphology and topography, hydrological condition, geological condition, etc. River bank protection will also be essential to avoid damage on the site due to bank erosion and flood. - The role of the local committee as well as consultation among developer, operators, and local communities are important to achieve good understanding and mutual acceptance for the project.
Afadole T/S	- IEE will be a prerequisite according to Nepalese legislation. - It is suggested that access road maintenance, speed limit and heavy equipment maintenance be provided to reduce the impacts of air pollution and noise. - In order to reduce the negative impact of odor, it is proposed to examine the effective unloading/loading work of waste handling. Regular or ad hoc observation of odor condition is also suggested in and around the site.
Taikabu LFS	- EIA will be a prerequisite according to Nepalese legislation. - It is suggested that access road maintenance, speed limit and heavy equipment maintenance be provided to reduce the impacts of air pollution and noise. - A gas ventilation system is to be planned and equipped in the landfill area for proper release of landfill gas. Regular monitoring of gas is also suggested. - A leachate control system is essential in order not to flow the leachate to outside of the site. A retention and recirculation facility associated with aeration of the leachate, which is functioning at Sisdol S/T-LF, is applicable and recommended. - In order to reduce the percolation of the leachate to the groundwater, it is recommended to install a liner system on the bottom of the landfill area. Geo-membrane placing is preferable when applicable, but when inapplicable clay liner is to be employed at least in the same manner as Sisdol S/T-LF. - A peripheral drainage system is to be designed and equipped for isolation of storm water runoff from the outside of the site. - Regular monitoring of river water, groundwater and leachate is essential. - In the process of site boundary delineation and project design, installation of a buffer zone is to be examined where applicable. In order to reduce the impact of odor, it is proposed to carry out soil cover regularly. Regular or ad hoc observation of the odor condition is also suggested in and around the site.
MTM Temporary LFS	- It should be confirmed to comply with the legal IEE/EIA requirement according to the project scale and location. - In order to reduce pollution of the water bodies including groundwater as much as possible, it is proposed i) to have more enhancement of transportation of the collected wastes to Teku T/S under cooperation with KMC, and ii) to cooperate with BKM and central government for developing Taikabu LF as early as possible. - In order to reduce the impact of odor, the most applicable approach is to select the site where the distance from the residential areas can be secured, since the site is not yet determined. Regular or ad hoc observation of the odor condition is also suggested in and around the site. - It is proposed to avoid cultural heritage or religious areas as much as possible in the site selection process.

Facility	Key or suggested issues
KRM Community Composting Facility	- It should be confirmed to comply with the legal IEE/EIA requirement according to the project scale and location. - Concrete placing on the working area will be suggested for reduction of groundwater pollution. A drainage system associated with small-scale treatment against water pollution is also to be considered as required. - In order to reduce the impact of odor, the most applicable approach is to select the site where the distance from the residential areas can be secured, since the site is not yet determined. Regular or ad hoc observation of the odor condition is also suggested in and around the site. - It is proposed to avoid cultural heritage or religious areas as much as possible in the site selection process.

Source: JICA Study Team

CHAPTER 12 EVALUATION OF CAPACITY DEVELOPMENT OF THE STUDY

Since the Study is a 'Capacity Development Type Study' of which an important aim is to assist the capacity development for solid waste management (SWM) of the five municipalities and the Solid Waste Management and Resource Mobilization Center (SWMRMC), the study process, i.e. development process of the Action Plans (A/Ps) as well as pilot projects activities, has been emphasized. In this connection, the activities during the whole study period have been evaluated in terms of the capacity development.

12.1 Overall Evaluation of Capacity Development of the Study

Before the Study, the mutual cooperation toward an appropriate solid waste management among the five municipalities and SWMRMC could not always function well because of a lack of common crisis consciousness, infrequent communication and lack of technical knowledge and skills in addition to the existence of a kind of territorial imperative. However, through the Study, it can be set a highly valued that all concerned, especially the Technical Working Group (TWG) and Task Force (T/F) members, could stand up and work together under the Umbrella Concept. Such activities were not always carried out in a friendly atmosphere and sometimes participants worked themselves into a frenzy of passionate argument. This can show that the organizational capacity was developed in that more serious and essential communication was made because the points were clarified from the technical, financial, social and environmental aspects, though there is still something held back in their respective positions.

As an acronym of "CKV" has become quite popular among the five municipalities, SWMRMC/MOLD and other organizations concerned as it has been contributing to create a sense of unity towards "Clean City (*Sapha Sahar*)". Not only TWG members or T/F members, but also other related organizations like NGOs, CBOs or private sector organizations, including local consultants, especially those involved in the Study, have been recognizing more and more about the "CKV Study: Clean Kathmandu Valley Study". This is also the result of development of the social capacity that understands what solid waste management is and what we should do for solid waste management. A mascot, Asakaji, has also contributed to crate this sense, although he faced some controversy problems in the initial stage.

For the technical aspect, the most developed part is the theoretical and practical experience with sanitary landfill together with semi-aerobic landfill. It can be said that all engineering staff amongst the TWG members now surely understand the concept and mechanism of a semi-aerobic landfill system. As participating in the waste quantity and quality and time and motion surveys and in the sold waste database establishment was able to improve the basic knowledge of SWM, some of the municipalities have started their own such surveys spontaneously.

In terms of human resource development, A/P formulation and a training series under the Pilot Projects have provided development. Also, presentation opportunities at a series of Public Hearings, Seminars and workshops have contributed to develop presentation and communication skills as well as to improve the understanding on technical aspects of SWM

for the members of TWG and T/F. Both domestic and overseas training including JICA Country Focus Training in Japan were quite effective for Nepalese counterparts to get to have new or different experiences through the training sessions and to keep the motivation for solid waste management. Furthermore, through those training tours, a sense of solidarity has arisen among the participants like members who share the same food bowl together.

By and large, capacity development for SWM of the relevant staff of the five municipalities and SWMRMC/MOLD has emerged through all of the activities under the Study, and is recognized as still progressing.

12.2 Evaluation of Individual Municipalities

12.2.1 Kathmandu Metropolitan City

As the largest municipality among the five, and with the most experience in SWM fields, KMC took the lead in many of the activities under the Study for other municipalities to follow. Similarly, individual capacities of its senior staff were the highest especially in terms of technical capacities, and many served as resource persons to other municipalities. With that in mind, it has been observed that the second-tier staff in the Environment Department of KMC, have not really developed their capacities to the extent that they could substitute for the senior staff in case of emergencies. For future capacity development programs, KMC should prioritize on providing second-tier staff with opportunities for training, which in turn will facilitate some delegation of responsibilities.

The technical capacity of KMC can be considered to be developed regarding the SWM-related facilities from the viewpoints of planning, design, and operation of a semi-aerobic landfill. Commencement of relatively long distance transportation to Sisdol S/T-LF as well as operation of the site and Teku T/S is providing the opportunities for KMC staff to examine their knowledge, which was only theoretical when learned through the workshops and the JICA Country Focused Training. Skills for teaching other staff regarding what has been learned/experienced have also been developed. The most remarkable point is that KMC has been changing its position from the leading municipality against SWMRMC to a municipality that positively struggles against the SWM problems in cooperation with SWMRMC and that other municipalities are recognizing giving its well experienced capacity. The quantitative data from weighbridges as the database is developed could dramatically change the existing solid waste data management system including the vehicle control.

The Community Mobilization Unit (CMU) of KMC has played a leading role in implementation of the areas of local level waste minimization activities as well as mass communication and education and community mobilization. Since it has sufficient experience through the Kathmandu Valley Mapping Project (KVMP) and USAID program, it was significantly useful for other municipalities to learn a variety of innovative activities and views from CMU. It is expected that CMU could take a lead in promoting a network for community mobilization even after the completion of the Study.

12.2.2 Lalitpur Sub-Metropolitan City

LSMC was considered to be the municipality with the greatest challenges in regards to coordinating their SWM related sections. From the beginning, LSMC T/F appeared to have struggled to get mobilized for activities implemented under the Study as well as in Pilot Projects. It was only after the Study started that it was discovered that the Community Development Section (CDS) had had substantial experience in conducting SWM related training.

To date, many changes have taken place. A genuine rapport appears to have developed among the three main key sections, Environment Section, Public Works Division and CDS, and more activities are being jointly implemented by the Environment Section and CDS. The T/F itself, after the definition of its Terms of Reference (TOR), has been the most systematically functioning among all five municipalities. The T/F was usually convened about once in every two weeks, and the member secretary maintains records of discussion for every meetings. The CEO also seems to be present in most of the sessions and actual decisions are taken related to the matter of SWM at the T/F and it has been acknowledged as such.

In LSMC, human resources in the Environment Section were developed well through the Study. However, at the municipality level as an organization, it might be said that the sense of municipality concern with SWM still needs to be developed because LSMC tends to depend on KMC for decision making related to the activities under the Umbrella Concept. In the case of facility operation, although technical knowledge and clear understanding of planning of SWM facilities and semi-aerobic sanitary landfill has been evaluated to be sufficient, it is suggested that LSMC should take a greater share of the Sisdol S/T-LF operation in close coordination with KMC.

It was observed that CDS has, during the Study, improved the level of knowledge and skills to organize the waste minimization by community mobilization as well as mass communication and education activities for SWM. Although it had limited activities related to SWM at the beginning of the Study, it has been able to carry out a number of SWM activities such as trainings, rallies, interactive meetings among women's groups, and sharing meetings among compost bin users, in addition to the Pilot Projects. The network with various NGOs, CBOs and schools has been gradually strengthened. The relatively high level of motivation among staff is attributed to the support provided by the Municipality.

12.2.3 Bhaktapur Municipality

Bhaktapur Municipality (BKM) was one of the municipalities where very high expectations existed with motivated staff, adequate financial and human resources, and strong leadership under a CEO with very high interest in SWM and the Study. However during the Pilot Projects implementation, it was observed that sometimes progress with activities was delayed due to various bottlenecks within the municipality and influences from outside the municipality. Although strong leadership like the current CEO is essential to the success of SWM Programs, the T/F must also be strengthened so that under any leadership, the municipality is systematically capable of carrying out its SWM services effectively.

The municipality had developed an organizational structure and staffing framework, which included recommendations on the restructuring of the solid waste management related

sections and sub-sections. This can be thought of a sign of capacity development. This restructuring exercise is expected to take precedence overall activities in FY2005/06 (2062[1]) so that capacity development activities are able to target the appropriate staff and sections in a more effective manner.

In terms of collection and transportation, although the importance of source-separated collection for more efficient operation of the existing composting facility was recognized, it took time for BKM to introduce and implement this system with a very intimate but disclosed relationship with the public. This experience can be utilized when BKM extends the source-separated collection areas or introduces a new collection system in the municipality. In addition, BKM has been evaluated as having a clear understanding of a semi-aerobic landfill system. This is clear from that fact that is has a keen desire to apply this system to Taikabu LFS. BKM has recently encountered the situation of receiving opposition from local communities against Taikabu LFS development. However, this event was turned around to be a rather good opportunity for BKM to help the concentration and intensification toward acceptable planning of a LFS.

Although it took time to build a good relationship and share a common understanding of SWM among BKM, NGO and the target communities that did neither participate in community-based activities nor get used to working with external organizations, they have been able to facilitate acceptance by the people of the community and coordinate with other stakeholders.

12.2.4 Madhyapur Thimi Municipality

Madhyapur Thimi Municipality (MTM), at the beginning of the Study, appeared to have had very limited capacity with only two active members from the municipal staff in regards to SWM. Their strategy was dependent on composting chambers, and it was already evident from existing practice that it had low sustainability. Organizationally, SWM was a secondary function managed by the Community Development and Sanitation Section (CDSS), and aside from mobilization of CBOs for SWM, not much activity took place. However, the core group responsible for SWM has steadily grown, and participation from non-Task Force members has shown very positive results.

MTM is another municipality in which capacities appear to have increased substantially. First, under the Study, MTM initiated its first waste collection and transportation system. MTM, which had not had any waste transportation before, is now gaining some capacity for those SWM activities through harder work on their preparation. Second, since May 2005, MTM has embarked on Public Private Partnership (PPP) arrangements with four organizations, on a pilot basis. Third, MTM has still included community composting chambers within the A/P, however before the activities begin, the T/F is scheduled to conduct a study to analyze what the conditions for operation would be. What is meaningful here is that MTM, despite its limited resources, has diversified its approach to SWM, and this broader spectrum allows for the municipality to gain exposure and options to select an approach which is most effective and sustainable. As reflection of its higher prioritization of SWM, MTM also now has a SWM Sub-Section with a staff who was previously deputed to the ward office.

[1] Nepalese Year

In terms of technical aspects, MTM staff actively participated in the workshops on environmental and social considerations and discussed the benefits associated with the Taikabu LFS and MTM has finally decided to go to Taikabu to dispose of its waste together with BKM. However, MTM has not yet been involved sufficiently in the actual development activities of Taikabu LFS. Although the human resources of MTM are still unable to be shared for the development, it is necessary for MTM to participate in the Taikabu project by degrees through coordination with BKM as well as SWMRMC.

12.2.5 Kirtipur Municipality

Kirtipur Municipality (KRM) had been very strategic in the fact that it had adopted PPP arrangements with UNIQUE and NEPCO for its municipal SWM. In other words, KRM itself did not have to be burdened with any SWM matters as long as the partnership with the private sector organizations (PSOs) went smoothly.

With the start of operation at Sisdol S/T-LF and subsequent expected closure of Bagmati River dumping site, KRM needed to develop a new waste collection and transportation plan. Since the municipality has had little operational experience in SWM, there is hesitancy on its part to try to address this problem within its own resources, in spite of the fact that i) KRM had understood the benefits associated with semi-aerobic sanitary landfill, and ii) a decision to send the waste to Teku T/S for disposal had already been made under the coordination with KMC. However, it was a great outcome that KRM had officially set up a new SWM Unit under the Planning and Technical Section during the study period and effective activities of SWM by KRM themselves are expected through the new SWM Unit.

In terms of waste minimization, KRM has improved their capacity through participation in related workshops and study tour to composting facility in India, OJTs under the Pilot Project practice. As evidence, plastic separation collection activity is being done very well. KRM also has shown high interest in training and mass communication and education activities. Considering the time when KRM had no specific community-based SWM, it was a sign of progress that it organized the two-day exhibition, formed women's groups and mobilized youth groups for plastic separation. However, it was sometimes observed that it took time to make a decision, even for small-scale activities, and as a result, the implementation of these activities was behind the schedule. It is expected that KRM put the planned activities in AWP into the practice without such delay.

12.2.6 SWMRMC

The technical capacity of SWMRMC can be considered to be developed regarding the SWM-related facilities from the viewpoints of:

- Planning of SWM facilities especially on semi-aerobic sanitary landfill
- Addressing community concerns
- Coordination with other municipalities for planning and developing facilities

In the course of Sisdol S/T-LF development, SWMRMC has put much effort into sorting out the various interests and concerns of stakeholders, and finally it has successfully coordinated the Sisdol development and operation commencement, accompanied with understanding and cooperation from Okharpauwa Sanitary Landfill Site Main Coordination Committee

(OSLSMCC) as well as beneficiary municipalities. The experiences of this mutual agreement between not only municipalities and SWMRMC but also this OSLSMCC can be a very precious case for any local government in the world that is facing same troubles to manage a landfill site. SWMRMC has now become, an example, displaying its technical ability and experience in assisting BKM for development of Taikabu LFS. It should also be noted that besides the Study, SWMRMC developed EIA Guidelines for Solid Waste Management Projects and distributed it to 58 municipalities in the whole of Nepal by mobilizing university students.

Based on these understandings, SWMRMC has been evaluated to have an enough potential to play the role of a national center for providing technical skills and support in LFS development field. However, participation of SWMRMC in operation of the facilities has been found to be less significant, especially in the Sisdol landfill. Since SWMRMC has much technical knowledge and experience on LFS development, it is preferable that its leadership continues to be developed even after the facilities' development.

Other than landfill facilities, SWMRMC has also improved its capacity on waste minimization through participation in related workshops, study tour and OJTs in the Pilot Project practices. SWMRMC has actively participated in several training sessions and a series of sharing meetings as an advisor, although SWMRMC is not an implementing agency for public awareness and community mobilization. The basis for crossing border to conduct various activities including solid waste data management other than facility planning and development has been established.

CHAPTER 13 RECOMMENDATIONS

13.1 Recommendations on Implementation of Action Plans

For effective and steady implementation of the Action Plans (A/Ps), the following are recommended from the technical and operational and managerial aspects.

13.1.1 Recommendations on Technical Aspects

(1) Improvement of Collection and Transportation

- A ward-wised or route-wised detail improvement plan for effective solid waste collection should be developed by utilizing GIS maps and time and motion surveys.
- Especially in BKM, MTM and KRM where collection rates are relatively lower, clear maps should be prepare for extension of solid waste collection service areas in order to minimize unserviced and insufficiently serviced areas.
- Appropriate operational time frame should be considered for unloading and loading practices at Teku T/S and transportation of waste to the Sisdol S/T-LFS by using arrival secondary transportation vehicles.
- For development of effective waste transportation, collection points and transfer station(s) should be located strategically. For this, an urban plan or urban traffic plan should be developed taking into consideration of the solid waste collection system.
- Collection zones should be defined clearly for private sectors collection in order to avoid any confusion among private sector operators and people.

(2) Promotion of Waste Minimization

- An authorized active working group (WG) should be organized to proceed with development of a WPF including private sector participation.
- Quality standards for compost products should be developed to secure the quality.
- Cooperation and information exchanges with farmers, District Agriculture Development Offices (DADOs) and relevant agricultural officers of VDCs should be continued to help increase of the demand for compost products.
- A social market should be promoted so that more recycled products are able to be sold at shops.
- Motivators should be appointed for effective monitoring and follow-up of home composting and recycling activities.
- The existing activities of recyclable waste pickers should be carefully secured when the A/Ps are going to be implemented.

(3) Improvement of Final Disposal System

- A regular coordination meeting among the concerned organizations should be held to discuss various issues of operation and management of the Sisdol S/T-LFS including sharing of responsibilities and costs and environmental protection.
- Through maintaining of a record of the operation of Sisdol S/T-LFS, further landfill technical skills should be examined and the knowledge gained from running the site and effects of semi-aerobic landfill should be spread widely.

- National technical standards for sanitary landfill to cover design requirements, appropriate local materials and resources for construction and facilities, landfill levels, acceptable leachate treatment standards, EIA study including environmental monitoring protocol, etc. should be prepared.
- SWMRMC EIA Guidelines should be carefully taken into consideration when facilities are planned and implemented.
- Illegal dumping practices should be minimized as soon as possible. For the temporary inevitable waste dumping, at least soil covering should be conduced in order to reduce environmental impact.

(4) Promotion of Public Participation and Behavior Change

- For Behavior Change Communication (BCC) approach, a mix use of mass communication, interpersonal communication and community mobilization should be applied in order to deliver and reinforce messages, information and skills regarding SWM.
- Public or environmental education for SWM should be regularly provided to a diversity of people as per the stages of behavior change. For this, it is recommended that "CKV week" be established on and around the environmental day, June 5, the memorial day of the first waste transportation to Sisdol S/T-LF so that each municipality can organize various public involvement activities.
- Community Mobilization Network (CoMoN) should be organized in order to provide interactive learning and sharing opportunities on the regular basis.
- It is recommended that various ways of partnership with qualified NGOs and CBOs be explored in the areas of public education and community mobilization in each municipality.

(5) Environmental and Social Considerations

- Official IEEs or EIAs stipulated in Nepalese legislation should be conducted with according to the characteristics and scale of projects or activities.
- There should be continuous stakeholder involvement in the various stages of the A/Ps' implementation should be made in order to have mutual understandings and acceptance for achieving good practices.
- Environmental pollution especially of water quality and odor should be reduced as much as possible through mitigation measures, which are to be examined in every project stage. Environmental monitoring is also essential.
- Every effort is to be made to avoid or minimize involuntary resettlement and land acquisition in the planning and design stage wherever possible. If inevitable, appropriate compensation should be provided in line with Nepalese legal requirements.
- In order i) to prevent the increment of risk of health hazard in SWM-related activities, and ii) to reduce the risk of infectious health hazard on the waste pickers, systems to manage hazardous and medical wastes are to be established as soon as possible.

13.1.2 Recommendations on Operational and Managerial Aspects

(1) Organizational and Institutional Arrangement

1) Rationalization of Institutional and Organizational Arrangement

- Institutional and organizational arrangement should be designed in a way that is in alignment with the various strategies and activities of the Action Plans.
- All municipalities, by the Mid-Term (FY2008/09 (2065/66[1])-FY2010/11 (2068/69)), should establish separately an independent SWM/Sanitation Section with appropriate staffing.
- Revised organizational structures that were supported by the Study should be processed for approval immediately by the Municipal Council.
- A monitoring and evaluation focal point should be appointed so that regular data collection and analysis could be conducted systematically and utilized for effective operational management.

2) Strengthening of Operation and Management Practices

- Operational management practice of planning, implementation, and monitoring and evaluation should be systematized to effectively carry out the planned activities of the A/Ps.
- From the respective A/Ps, activities should be broken down into Annual Work Plans (AWPs) every year with enough budget and responsible staff assigned.
- Program-based budgeting and expenditure monitoring should be introduced for more effective financial management and efficient use of resources.
- Strengthening of information management systems (both paper-based and electronic based), should be activated so that relevant data is upstreamed to the managing officers for informed decision-making and planning.
- Vertical and horizontal information and knowledge sharing through regular staff meetings and formal/informal seminars would be a key to garner a culture of transparency as well as to raise staff morale.

3) Promotion of Building Partnerships with Private Sectors and Communities

- Municipalities with less experience should increase their exposure to ongoing activities of various civil society actors (both private sector, NGOs and CBOs) to enhance understanding of the potential and limitations of approaches adopted by those actors.
- A partnership strategy should be formulated with the Private Sector/Communities in the context of each municipality by examining areas where these actors have a comparative advantage vis-à-vis direct implementation by the municipality.
- Municipalities should promote a culture of transparency and accountability that would encourage participation of private sector/communities in various stages of SWM program planning, implementation and evaluation.

[1] Nepalese Year

4) Establishment of Applicable Mechanisms for Sustainable Human Resource Management and Development

- A learning manager, who develops and maintains an inventory of existing skills and knowledge, training history and job responsibilities of all staff within the section, should be appointed.
- A sustainable amount of annual budget should be allocated to staff development programs for those who do not have access to external training opportunities.
- Knowledge sharing of training experiences should be made mandatory to institutionalize the impact of training for the organization. For this, various training programs and materials on SWM should be compiled by each municipality.
- Each municipality should make further efforts to ensure an enabling environment for trained staff through organizational strengthening and institutional development.

(2) Establishment of Sustainable SWM-related Data Management System

- By using weighbridges, the quantity of solid waste including transported waste to Teku T/S and Sisdol S/T-LF should be measured and recorded to manage both facilities effectively and to monitor the target of the A/Ps.
- Solid waste quantity and quality survey should be conducted periodically, twice a year in dry and wet seasons, every year in small scale and every three years in large-scale area.
- The database on solid waste management should be maintained appropriately as it will be utilized and the compiled data should be opened to the public.

13.1.3 Recommendations on Stakeholder Network

TWG meetings should be held regularly under the coordination of SWMRMC so that the five municipalities are able to cooperate for realizing the Umbrella Concept including sharing of responsibilities and costs for an Overall Facility Plan (OFP) and Overall Equipment Plan (OEP).

The good initiatives and best practices for SWM activities should be collected, complied and published by SWMRMC together with the five municipalities so that the five municipalities are able to refer these practices each others.

As there is a need for strengthening the network with and among other stakeholders, including NGOs/CBOs, local consultants, colleges/universities, schools, local clubs and groups, line agencies and the mass media, regular sharing meetings among them should be organized for better and sustainable SWM.

Synergetic effects from the partnership with donors and international organizations including international NGOs working in the fields relating not only to solid waste management but also to organizational and institutional development of local bodies should be fully utilized.

13.2 Recommendations to Specific Solid Wastes

The amount of discharge of industrial waste seems to be minimal and issues of hazardous waste hardly exist. For the improvement of industrial waste management in the Kathmandu Valley, the following measures are recommended.

- Development of practical guidelines for industrial waste management
- Establishment of an official definition of hazardous and non-hazardous industrial wastes
- Promotion of proper handling of industrial waste
- Promotion of cleaner production to factories
- Implementation of awareness and training programs to factories

Although several guidelines have been issued for proper management and handling of medical waste, especially infectious waste, limited numbers of health care institutions are following the guidelines. The infectious waste or dangerous/sharp waste are mixed with municipal solid waste. In particular, as the infectious medial waste is not allowed to be dispose of in the Sisdol S/T-LF, the treatment of it is an unguent issues to be solved. For improvement of these conditions, it is recommended that the following measures should be taken urgently.

- Promotion of obedience to National Health Care Waste Management Guidelines
- Establishment of a centralized system for treatment of infectious waste
- Implementation of awareness and training programs in hospitals and clinics
- Promotion of source segregation of infectious waste
- Establishment of relevant act and regulations

13.3 Monitoring and Follow-up Activities Planned in Phase 4

It is proposed that monitoring of the activities planned in the respective Annual Work Plans of FY2005/2006 (2062/63) of the five municipalities and SWMRMC and evaluate of its' progress be implemented in Phase 4 of the Study. It is also recommended that the follow-up of the activities, including environmental and social considerations, be implemented for its effective and steady implementation.

APPENDICES

- APPENDIX 1 Member of the CKV Study and Committees
- APPENDIX 2 Project Design Matrixes (PDMs)
- APPENDIX 3 Solid Waste Flow of Five Municipalities (Current, Future)
- APPENDIX 4 Selected Photo

APPENDIX 1

Member of the CKV Study and Committees

APPENDIX 1 MEMBER OF THE STUDY AND COMMITTEES

CKV Study Team

Technical Working Group (Total 18 members) *As of July 20, 2005*

Organizations	Name	Designation / Organizational Position
MOLD	Mr. Babu Ram Gautam (Mr. Prem Raj Giri up to Nov, 2004)	Under Secretary
SWMRMC	Mr. Surya Man Shakya (Chairperson up to June 23, 2005)	Former General Manager
	Mr. Ashok Shahi (Chair person after June 24, 2005)	Acting General Manager
	Mr. Ram Sharan Maharjan	Civil Engineer
	Mr. Nirmal Darshan Acharya	Civil Engineer
KMC	Mr. Rajesh Manandhar	Chief, Solid Waste Management Section
	Mr. Kiran Ulak	Engineer, Solid Waste Management Section
	Mr. Purusotam Shakya	Chief, Mechanical Section
LSMC	Mr. Rudra Prasad Gautam	Chief, Public Works Division
	Mr. Pradeep Amatya	Chief, Environment and Sanitation Section
BKM	Mr. Laxman Kisiju	Chief, Planning and Technical Section
	Mr. Moti Bhakta Shrestha	Chief, Social Welfare & Sanitation Section
	Mr. Dinesh Rajbhandari	Sanitation Engineer, Planning and Technical Section
MTM	Mr. Satya Narayan Shah	Chief, Planning and Technical Section
	Ms. Krishna Kumari Shrestha	Assistant, Community Development and Sanitation Section
	Mr. Surendra Shrestha	Junior Engineer, Planning and Technical Section
KRM	Mr. Anuj Pradhan	Chief, Solid Waste Management Unit
	Mr. Gyan Bazra Maharjan	Assistant, Solid Waste Management Unit/Accounting

Task Force (Total 54 members) *As of July 20, 2005*

Organizations	Name	Designation / Organizational Position
SWMRMC (8)	Mr. Surya Man Shakya (Up to June 23, 2005)	Former General Manager
	Mr. Ashok Shahi	Acting General Manager
	Mr. Ram Sharan Maharjan	Civil Engineer
	Mr. Nirmal Darshan Acharya	Civil Engineer
	Mr. Lal Bahadur Karki	Account Officer
	Mr. Topa Ram Acharya	Administration Officer
	Mr. Ashok Ratna Tuladhar	Consultant Engineer
	Dr. Nawa Raj Khatiwada	Environmental Engineer, SchEMS
KMC (15)	Mr. Indra Man Suwal	Head, Environment Department
	Mr. Rajesh Manandhar	Chief, Solid Waste Management Section
	Mr. Kiran Ulak	Engineer, Solid Waste Management Section
	Mr. Purusotam Shakya	Chief, Mechanical Section
	Ms. Shriju Pradhan	Community Mobilization Unit
	Ms. Sanu Maiya Maharjan	Community Mobilization Unit
	Mr. Deepak Kansakar	Engineer, Solid Waste Management Section
	Mr. Krishna P. Kafle	Department of Mines and Geology
	Mr. Puskar L. Shrestha	LIUD (NGO)
	Mr. Basu Upreti	Kathmandu Mahanagar SWM Services
	Mr. Padma S. Joshi	IOE/TU
	Mr. Shirish Singh	ENPHO (NGO)
	Mr. Prakash M. Sharma	PROPUBLIC
	Mr. Drona Raj Ghimire	Nefeej
	Mr. Shankar Raj Kandel	Head, International Cooperation and Coordination Department

Organizations	Name	Designation / Organizational Position
LSMC (8)	Mr. Komal Prashad Kafle	CEO
	Mr. Rudra Prasad Gautam	Chief, Public Works Division
	Mr. Pradeep Amatya	Section Chief, Environment and Sanitation Section
	Mr. Prabin Shrestha	Division Chief, Town Development Division
	Mr. Mukunda Ranjit	Overseer, Environment Section
	Mr. Ashok Shrestha	Division Chief, Administrative Division
	Ms. Laxmi Prasad Rajbhandari	Section Chief, Community Development Section
	Ms. Sabina Maharjan	Community Development Section
BKM (9)	Mr. Badrinath Ghimire	CEO
	Mr. Laxman Kisiju	Chief, Planning and Technical Section
	Mr. Moti Bhakta Shrestha	Chief, Social Welfare & Sanitation Section
	Mr. Dinesh Rajbhandari	Sanitation Engineer, Planning and Technical Section
	Mr. Dilip Kumar Suwal	Chief, Sanitation Sub-section
	Mr. Krishna Prashad Suwal	Assistant, Social Welfare & Sanitation Section
	Mr. Revid Kusma	Chief, Store Sub-section
	Ms. Ambika Dhauvadel	Chief, Administration Section
	Ms. Ratnamaya Shrestha	Chief, Financial Section
MTM (8)	Mr. Satya Narayan Shah	Chief, Planning and Technical Section
	Ms. Krishna Kumari Shrestha	Assistant, Community Development and Sanitation Section
	Mr. Tulsi Bhakta Tako	Section Chief, Community Development and Sanitation Section
	Mr. Surendra Shrestha	Junior Engineer, Planning and Technical Section
	Mr. Shiva Man Shrestha	Policy Management / Lawyer
	Mr. Kai Prashad Waije	Architect/ Urban Planner
	Ms. Shanti Karanjit	Environmentalist
	Mr. Krishna Sundar Thapamagar	Sub Accountant, Account Section
KRM (6)	Mr. Bal Krishna Maharjan	Chief, Planning and Technical Section
	Mr. Anuj Pradhan	Assistant, Planning and Technical Section
	Mr. Gyan Bazra Maharjan	Assistant, Solid Waste Management/Accounting
	Mr. Krishna Bhola Maharjan	Junior Engineer, Planning and Technical Section
	Mr. Sanu Babu Pariyar	Account Officer, Administration Section
	Mr. Swodesh Maharjan	Unique Group (NGO)

JICA Study Team (Total 10 members) *As of July 20, 2005*

Name	Assignment
Mr. Toshiyuki Ujiie	Team Leader / Solid Waste Management Policy
Mr. Mahmoud Riad	Facility Plan
Mr. Shungo Soeda	Collection & Transportation / Recycling System (1)
Mr. Kiyoshi Shimizu	Recycling System (2) / Hazardous Waste
Mr. Satoshi Higashinakagawa	Equipment Procurement Plan
Mr. Norihiko Inoue	Environment
Ms. Toshiko Shimada	Public Participation / Social Consideration (Public Relations (1))
Ms. Minako Nakatani	Institutional and Organizational Strengthening/ Human Resources Development
Mr. Noboru Osakabe	Financial Analysis
Ms. Sachiko Suswa	Public Participation / Social Consideration (2) / Coordinator (Public Relations (2))

Committee

Steering Committee Members *As of July 20, 2005*

Organizations	Name	Position
MOLD	Mr. Som Lal Subedi	Joint Secretary
MOLD, Environmental Management Section of Municipal Management Division (as member secretary)	Mr. Babu Ram Gautam	Under Secretary, Chief of Environmental Management Section
SWMRMC	Mr. Surya Man Shakya	General Manager
KMC	Mr. Hem Sharma Pokharel	CEO
LSMC	Mr. Komal P. Kafle	CEO
BKM	Mr. Badri Nath Ghimire	CEO
MTM	Mr. Bhuwan Prasad Bista	CEO
KRM	Mr. Naresh Regmi	CEO
Ministry of Environment, Science and Technology	*	
Ministry of Physical Planning and Works	Mr. Hari Ram Koirala	Joint Secretary
Ministry of Industry, Commerce and Supplies	Mr. Baikuntha Bd. Adhikari	Department of Industry, director
Ministry of Education and Sports	Mr. Narayan Pd. Kafle	Under Secretary
Ministry of Agriculture and Cooperative	Ms. Bidya Pandey	Horticulture Development Officer
Ministry of Health and Population	Dr. Bishnu Prasad Pandit	Chief Specialist, Curative Division

Note:*Because of restructuring of Ministry of Population and Environment, this position is now vacant.

JICA Advisory Committee *As of July 20, 2005*

Name	Position
Dr. Isamu Yokota	Professor, Graduate School of Nutritional and Environmental Sciences, University of Shizuoka
Dr. Ayako Tanaka	Professor, Pharmacist, Department of Civil Engineering, Faculty of Engineering, Fukuoka University
Mr. Akio Kubota	Assistant Chief, Environmental Development Section, Citizen and Environment Department, Matsumoto City Corporation, Nagano Prefecture

APPENDIX 2

Project Design Matrixes (PDMs)

APPENDIX 2 (1) PROJECT DESIGN MATRIX (PDM_2)

Project name: Improvement of Collection and Transportation — Duration: July, 2004 to June, 2005

Project areas: KMC, LSMC, BKM, MTM, KRM — Target groups: Staff of the five Municipalities and SWMRMC — Date: March 21, 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
【Overall Goal】 • SWM service of respective municipalities is improved through capacity development (solid waste management ratio is increase)	1. The consolidated waste management ratio of the five municipalities reaches 93% (or 718 ton/day) by the end of 2015 from the current level of 76 % (or 331 ton/day).	1 Consolidated waste management ratio and quantity of the five municipalities	• Political stability • No drastic change in the availability of financial resources. • Decentralization of SWM responsibilities is not reversed by HMG/N.
【Project Purpose】 • Capabilities of relevant staff of the five municipalities and SWMRMC regarding waste collection and transportation are strengthened.	• By the end of June 2005, the amount of transported waste to the designated landfill site(s) is increased.	1. Pilot Project report 2. Daily record of collected waste quantity or volume 3. Daily record of transported and disposed of waste quantity or volume	• Budget allocation is ensured to implement waste data management based on Action Plan on SWM.
【Outputs】 1. Basic knowledge and experience about efficient primary collection with measures such as source-separated collection are obtained among the relevant officials in municipalities. 2. Practical guideline for public private partnership for SWM is prepared. 3. Basic knowledge and experience regarding transfer station are obtained	1-1. By the end of the Pilot Project, separated collection is implemented at 500 households at the specified areas in BKM 1-2. By the end of the Pilot Project, households at the specified areas in MTM receive collection service 2. By the end of the Pilot Project, a set of contract/agreement forms is prepared as guideline 3. By the end of the Pilot Project, Teku T/S is improved and tentative transfer haul practices are started	1-1. Pilot Project report 1-2. Pilot Project report 2. Pilot Project report 3. Project document/report (including as built document of Teku T/S)	• Each municipality transports collected waste to the designated final disposal site

【Activities】	【Inputs】	【Inputs】	• Trained staff continue working in municipalities and SWMRMC
1. Practices of Solid Waste Collection at Model Areas 1-1. Practice of source-separated collection in BKM 1-2. Practice of collection and transportation in MTM 2. Training for Public Private Partnership (PPP) for Solid Waste Management 2-1. Review of the existing PPP activities 2-2. Study of an appropriate contract/agreement forms between municipality and private sectors 2-3. Preparation of handbook for Public Private Partnership 3. Training/Practice of Transfer Station (Teku T/S) 3-1. Training for planning of T/S 3-2. Training for designing T/S 3-3. Training for construction and supervision of improvement of T/S 3-4. Practice of operation of T/S	Japan (1) Personnel • Members of the JICA Study Team - Collection and Transportation - Public Involvement/ Social Consideration - Organizational and Institution Strengthening - Facility Plan • Local consultants (2) Equipment - Waste bins for source-separation (BKM) - Waste collection vehicle (3.5m^3) (MTM) (3) Improvement works of Teku T/S	Nepal (1) Personnel • Counterparts and other relevant staff - SWMRMC - KMC - LSMC - BKM - MTM - KRM (2) Site arrangement in Teku T/S and O&M of Teku T/S	**【Preconditions】** • Political and security conditions are not worsen. • Stakeholders do not oppose the Pilot Project

APPENDIX 2 (2) PROJECT DESIGN MATRIX (PDM_2)

Project name: Promotion of Waste Minimization — Duration : June, 2004 to June, 2005

Project areas: KMC, LSMC, BKM, MTM, KRM — Target groups : Staff of the five Municipalities and SWMRMC — Date: March 21, 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
【Overall Goal】 • SWM service of respective municipalities is improved through capacity development (solid waste management ratio is increase)	1. The consolidated waste management ratio of the five municipalities reaches 93% (or 718 ton/day) by the end of 2015 from the current level of 76 % (or 331 ton/day).	1 Consolidated waste management ratio and quantity of the five municipalities	• Political stability • No drastic change in the availability of financial resources. • Decentralization of SWM responsibilities is not reversed by HMG/N.
【Project Purpose】 • Capabilities of relevant staff of the five municipalities and SWMRMC regarding waste minimization are strengthened.	• By the end of June 2005, more than 1,200 households are newly involved waste minimization activities	1. Pilot Project report	• Each municipality continues and distribute pilot activities
【Outputs】 1. The waste minimization facility is planned 2. Local level waste minimization activities are strengthened	1. By the end of Pilot Project, a new waste minimization facility is planned. 2. By the end of Pilot Project, local level waste minimization activities (home composting, separation collection of plastic) are implemented	1. Planning report for waste minimization facility 2. Pilot Project report	• Waste management conditions (collection, transportation and disposal) in the Katmandu Valley do not become worse than actual conditions.

【Activities】	【Inputs】	【Inputs】	• Trained staff continue working in municipalities and SWMRMC
1. Training for Waste Minimization Facility 1-1 Verification of existing technology for waste minimization 1-2 Data collection at BKM waste processing facility 1-3 Marketing survey of compost product 1-4 Development of basic plan of a large scale waste processing facility 1-5 Pre-feasibility examination on a large scale waste processing facility 1-6 Study tour in India 2. Practice of Local Level Waste Minimization Activities 2-1 Practice of community-based waste minimization activities in a model area (in KMC) 2-2 Practice of medium-scale vermi composting (in KMC) 2-3 Practice of promotion of home composting (in LSMC) 2-4 Practice of plastic separation and home composting (in KRM)	Japan (1) Personnel • Members of the JICA Study Team - Recycling system - Public involvement/Social consideration • Local consultants • Local NGOs, resource persons and assistants (2) Study tour (3) Recycling center, vermin-composting shed, home compost bins, suiro and cotton bag, manuals, plastic store house and stationeries for training	Nepal (1) Personnel • Counterparts and other relevant staff - SWMRMC - KMC - LSMC - BKM - MTM - KRM • Existing composting facility operators in Bhaktapur (2) Facilities Necessary land, buildings and equipment	**【Preconditions】** • The policy of the Nepalese Government remains same regarding the solid waste management • Stakeholders do not oppose the Pilot Project.

APPENDIX 2 (3) PROJECT DESIGN MATRIX (PDM_2)

Project name: Improvement of Final Disposal Planning and Operation — Duration : June, 2004 to June, 2005

Project areas: KMC, LSMC, BKM, MTM, KRM — Target groups : Staff of the five Municipalities and SWMRMC — Date: March 21, 2005

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
【Overall Goal】 • SWM service of respective municipalities is improved through capacity development (solid waste management ratio is increase)	1. The consolidated solid waste disposal ratio to sanitary landfill site(s) of the five municipalities reaches 100% of the colleted waste by the end of 2015 from the current level of 0%.	1. Consolidated waste management ratio and quantity of the five municipalities	• •Political stability No drastic change in the availability of financial resources. Decentralization of SWM responsibilities is not reversed by HMG/N.
【Project Purpose】 • Capabilities of relevant staff of the five municipalities and SWMRMC regarding final disposal planning and operation are strengthened.	• By the end of June 2005, sanitary landfilling activities (soil covering, leachate control, environmental monitoring) are implemented at Sisdol Valley I	1. Pilot Project repot	• Budget allocation is ensured to develop sanitary landfill sites
【Outputs】 1. Basic knowledge for planning of final disposal is obtained. 2. Basic knowledge and experiences are obtained on planning, designing, construction and O&M of semi-aerobic sanitary landfilling manners.	1-1. By the end of Pilot Project, the candidates for L/T-LFS are selected 1-2. By the end of Pilot Project, environmental and social consideration for landfill site is compiled 2-2. By the end of Pilot Project, sanitary landfill site with semi aerobic system is developed at Sisdol Valley I	1. Pilot Project report 2. Pilot Project repot (including as built document of Sisdol)	• Staff is assigned to Sisdol S/T-LF Valley I by KMC and LSMC • KMC and LSMC together with SWMRMC transport the collected solid waste to Sisdol S/T-LF

【Activities】	【Inputs】	【Inputs】	• Trained staff continue working in municipalities and SWMRMC
1. Training for Final Disposal Planning 1-1. Training for site selection 1-2. Training for environmental/social consideration on landfill site 2. Training/Practice for Semi-aerobic Sanitary Landfill (Sisdol S/T-LFS) 2-1. Training for planning (1) Site visit to Pokhara (2) Site visit to Malaysia 2-2. Training for design 2-3. Training for construction supervision (1) Joint site visit to Sisdol 2-4 Practice of O&M including environmental monitoring (1) OJT on O&M (2) Environmental monitoring and monitoring committee	Japan (1) Personnel • Members of the JICA Study Team - Facility plan - Environment - Public Involvement/ Social Consideration - Organizational and Institutional Strengthening - Human Resource Development • Local consultants, local contractor, local resource persons (training, facilities design, construction, environmental monitoring) (2) Study tour (3) Improvement waste of Sisdol S/T-LFS	Nepal (1) Personnel • Counterparts and other relevant staff - SWMRMC - KMC - LSMC - BKM - MTM - KRM (2) Cost - Sisdol S/T-LF preparation except semi-aerobic manner - Access road improvement and maintenance (3) Equipment for Sisdol S/T-LF operation and for transportation	【Preconditions】 • Political and security conditions are not worsen. • Stakeholders do not oppose the Pilot Project

APPENDIX 2 (4) PROJECT DESIGN MATRIX (PDM_2)

Project name: Promotion of Public Awareness and Behavior Change Communication/Education — Duration : July, 2004 to June, 2005

Project areas: KMC, LSMC, BKT, KRM, MTM — Target groups : Staff of the five Municipalities and SWMRMC — Date: March 21, 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
【Overall Goal】 • SWM service of respective municipalities is improved through capacity development (solid waste management ratio is increase)	1. The consolidated waste management ratio of the five municipalities reaches 93% (or 718 ton/day) by the end of 2015 from the current level of 76 % (or 331 ton/day).	1 Consolidated waste management ratio and quantity of the five municipalities	• Political stability • No drastic change in the availability of financial resources. • Decentralization of SWM responsibilities is not reversed by HMG/N.
【Project Purpose】 • Capabilities of relevant staff of the five municipalities and SWMRMC regarding public awareness and behavior change communication/ education are strengthened.	• The strategies regarding awareness and public education are formulated and incorporated into Action Plan on SWM in each municipality by the end of June 2005.	1. Action Plan on SWM in each municipality (physical verification) 2. Result of rapid self-assessment sheet (to be distributed to relevant municipality officials before and after the Pilot Project) 3. Result of rapid competency rating sheet (to be made and marked by the Japanese members of Study Team before and after the Pilot Project)	• Budget allocation is ensured to implement awareness and public education based on Action Plan on SWM.
【Outputs】 1. Basic knowledge about community mobilization including public education in SWM is gained among relevant officials in municipalities. 2. Know-how of mass communication and education approach is transferred.	1-1. 80% of target groups participate in training by the end of Pilot Project. 1-2. The meetings on awareness and public education are jointly organized by target groups three times by the end of Pilot Project 2. Educational event is implemented by target groups in each municipality by the end of Pilot Project.	1-1. Pilot Project document/report 1-2. Pilot Project document/report 2. Pilot Project document/report	• The importance of public education and awareness on SWM is recognized by high-level officials in municipalities.

3. Know-how of interpersonal communication and education approach is transferred.	3. The level of knowledge, attitude, and practice regarding SWM is improved among targeted children or communities.	3. Project document/report (The results of baseline and impact surveys)	
【Activities】 1. Training for Community Mobilization Activities 1-1. Training for community mobilization and public education/awareness on SWM, and hold sharing meetings 1-2. Study tour to Hetauda 2. Practice of Mass Communication and Education 2-1 Selection of mascot of CKV Study and distribute stickers 2-2 Undertaking of educational events &exhibition 2-3 Broadcasting of radio commercial 2-4 Wall painting 2-5 Implementation of clean up in the community 3. Practice of Interpersonal Communication and Education 3-1 To conduct baseline survey regarding knowledge, attitude and practice on SWM 3-2 To provide counselor training camp for youth and teachers who support children's activities 3-3 To conduct camp and establish "Nature Club" and support small scale SWM activities 3-4 To conduct workshop on resource material development, printing and paper making 3-5 To hold sharing and exchanging meetings 3-6 To conduct impact survey	**【Inputs】** Japan (1) Personnel • Members of the JICA Study Team - Public Involvement/ Social Consideration - Public Relations - Organizational and Institutional Strengthening/Human Resources Development • Local consultants, NGOs (2) Operational cost - Professionals of art, broadcast - Study tour to Hetauda	Nepal (1) Personnel • Counterparts and other relevant staff - SWMRMC - KMC - LSMC - BKM - MTM - KRM (2) Facilities Land, buildings and materials	• Trained staff continue working in municipalities and SWMRMC . **【Preconditions】** • Political and security conditions are not worsen.

APPENDIX 2 (5) PROJECT DESIGN MATRIX (PDM_2)

Project name: Development of Operation and Management Capacities — Duration : July, 2004 to June, 2005

Project areas: KMC, LSMC, BKT, KRM, MTM — Target groups : Staff of the five Municipalities and SWMRMC — Date: March 21, 2005

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
【Overall Goal】 • SWM service of respective municipalities is improved through capacity development (solid waste management ratio is increase)	1. The consolidated waste management ratio of the five municipalities reaches 93% (or 718 ton/day) by the end of 2015 from the current level of 76 % (or 331 ton/day).	1 Consolidated waste management ratio and quantity of the five municipalities	• Political stability • No drastic change in the availability of financial resources. • Decentralization of SWM responsibilities is not reversed by HMG.
【Project Purpose】 • Capabilities of relevant staff of the five municipalities and SWMRMC regarding technical and operational management on solid waste are strengthened.	• By the end of June 2005, annual work plan of five municipalities of next fiscal year with finical plan are developed based on reliable data	1. Pilot Project report	• Commitment to of municipalities to SWM capacity building trained staff stay within the system.
【Outputs】 1. Municipalities acquire necessary capacities to operationalize Action Plans 2. Municipalities acquire the skills and knowledge to collect and manage SWM data	1. By the end of Pilot Project, working items with responsible persons and budget (financial plan) are developed. 2. By the end of Pilot Project, solid waste database of each municipality is developed.	1. Pilot Project report 2-1. SWM database 2-2. Pilot Project report	• Staff is made available for the training. • Computer literacy for staff responsible for data management.

【Activities】	【Inputs】	【Inputs】	• Staff are willingness to attend training programs. • Staff are willing to apply new learning to practice
1 Training for Action Plan Operational Management 1-1 Transfer of planning and data collection know how from the JICA Study Team 1-2 Monthly management training sessions 1-3 Operationalization of Action Plans 1-4 Monthly monitoring of training results 1-5 Self-evaluation exercise 2 Practice of Solid Waste Data Management 2-1 Practice for solid waste quality and quantity survey 2-2 Practice of solid waste data management for SWM 3 Training for SWM Policy and Technology 3-1 Participation of JICA Country Focus Training	Japan (1) Personnel • Members of the JICA Study Team - Collection and transportation - Organization and institution Strengthening - Financial Analysis • Local consultants (2) Equipment - Sets of computer and printer (3) Country Focus Training Program	Nepal (1) Personnel • Counterparts and other relevant staff - SWMRMC - KMC - LSMC - BKM - MTM - KRM (2) Facility - Venue for training	【Preconditions】 • Municipalities are interested in improving their SWM services.

APPENDIX 3

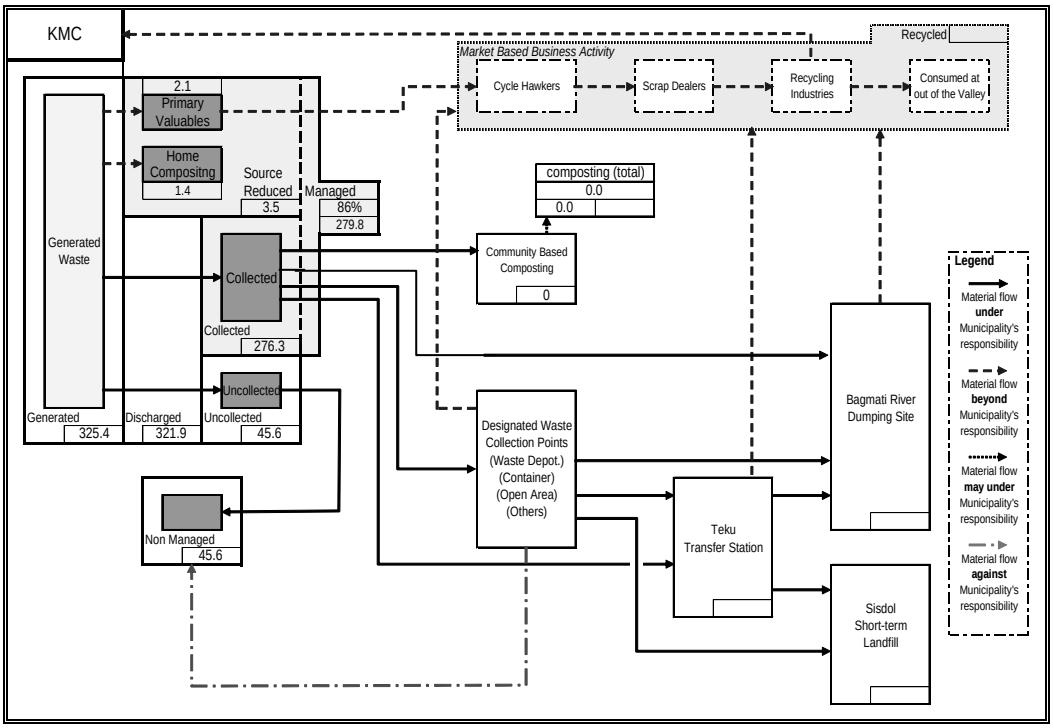
Solid Waste Flow of Five Municipalities (Current, Future)

APPENDIX 3 SOLID WASTE STREAM FLOW OF FIVE MUNICIPALITIES (CURRENT, FUTURE)

1. Kathmandu Metropolitan City

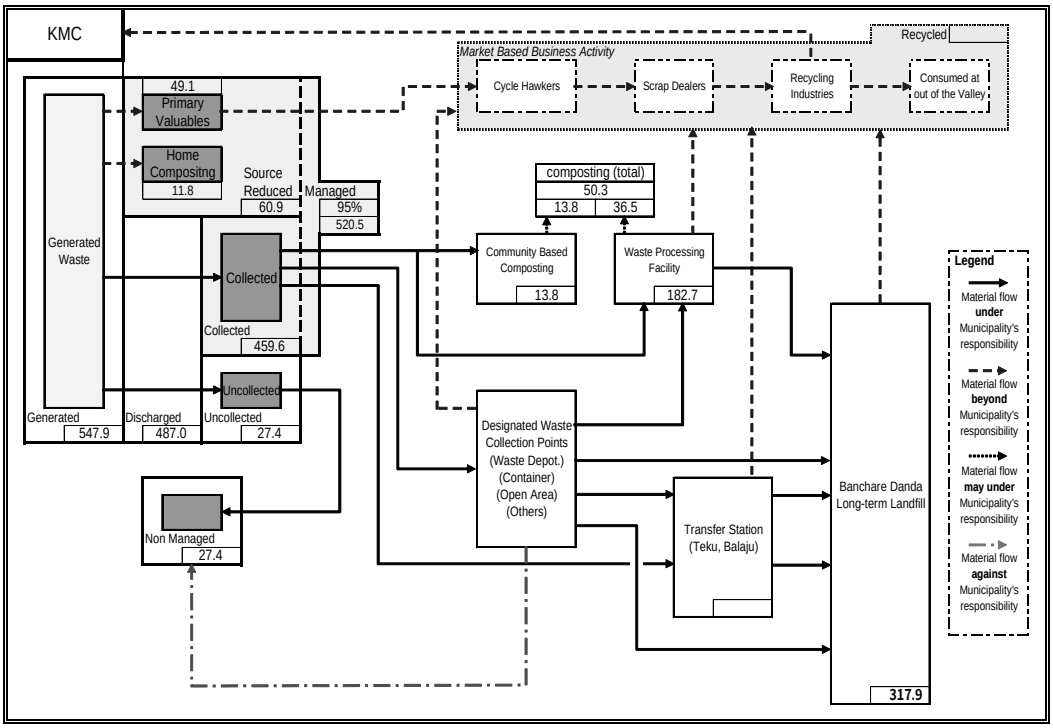
Existing Solid Waste Stream (2005)

Unit: t/day



Future Solid Waste Stream (2015)

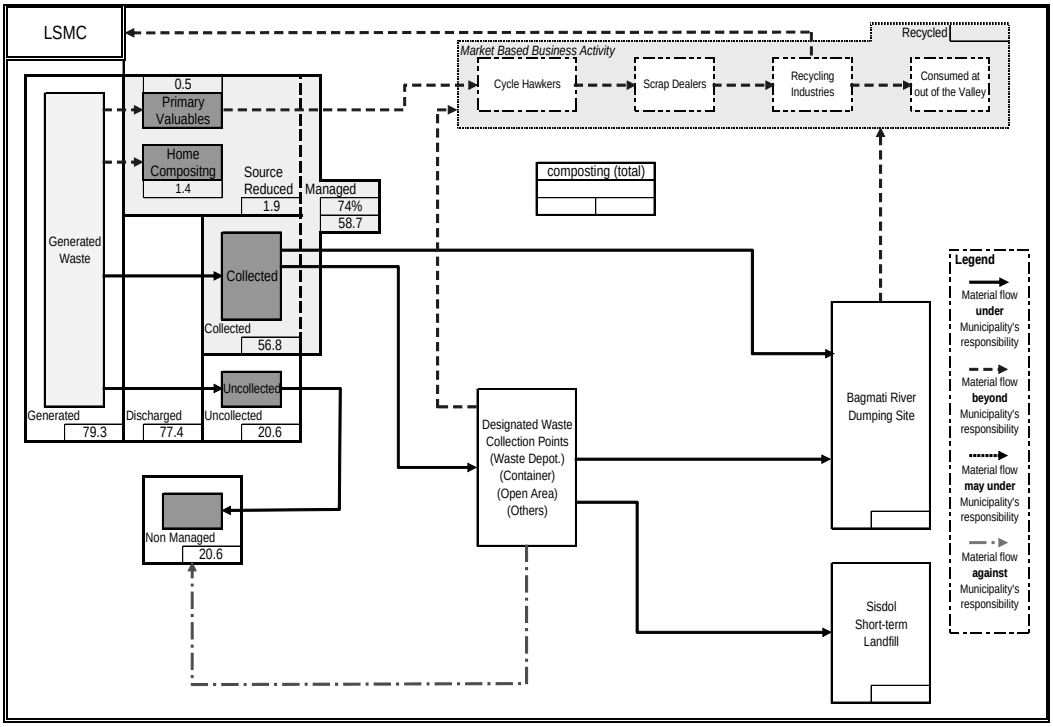
Unit: t/day



2. Lalitpur Sub-Metropolitan City

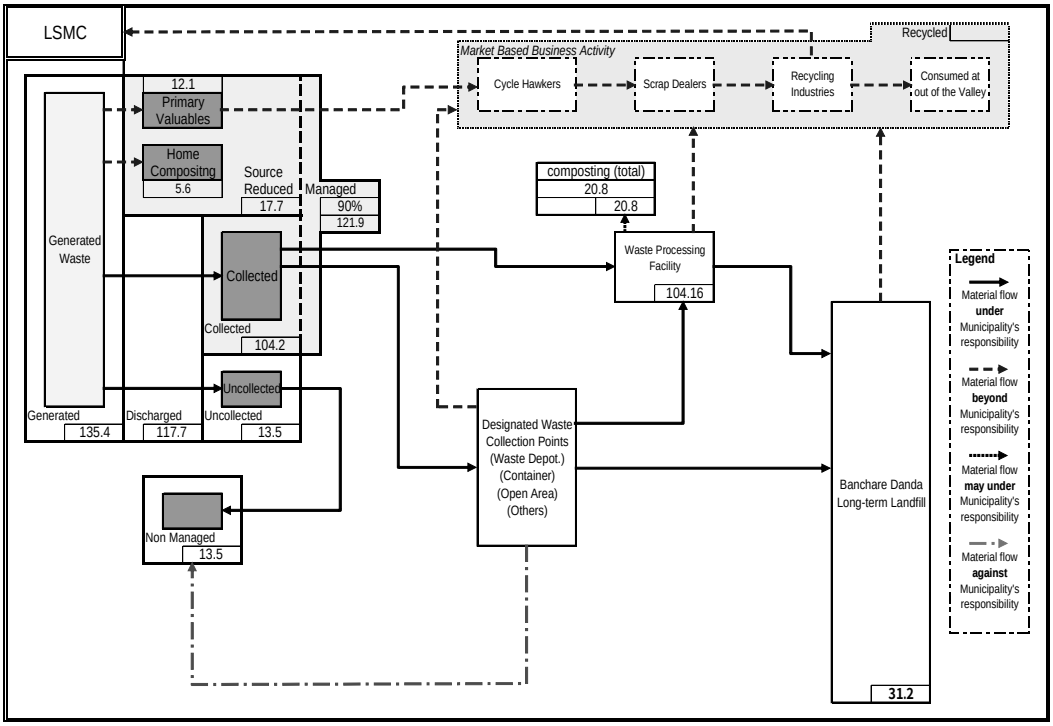
Existing Solid Waste Stream (2005)

Unit: t/day



Future Solid Waste Stream (2015)

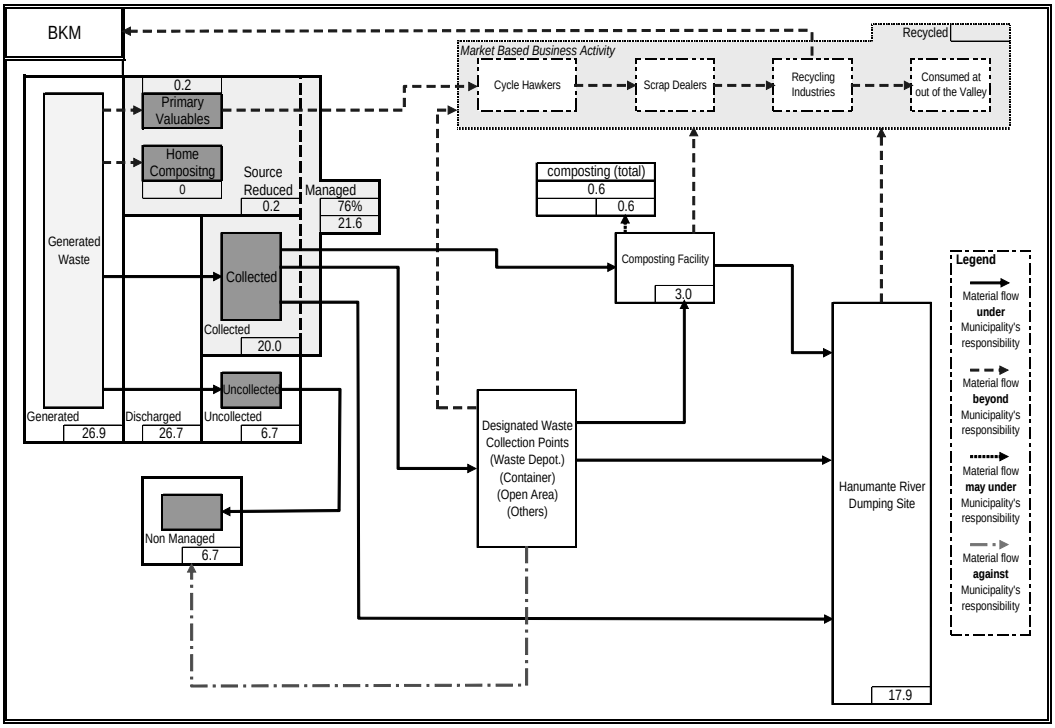
Unit: t/day



3. Bhaktapur Municipality

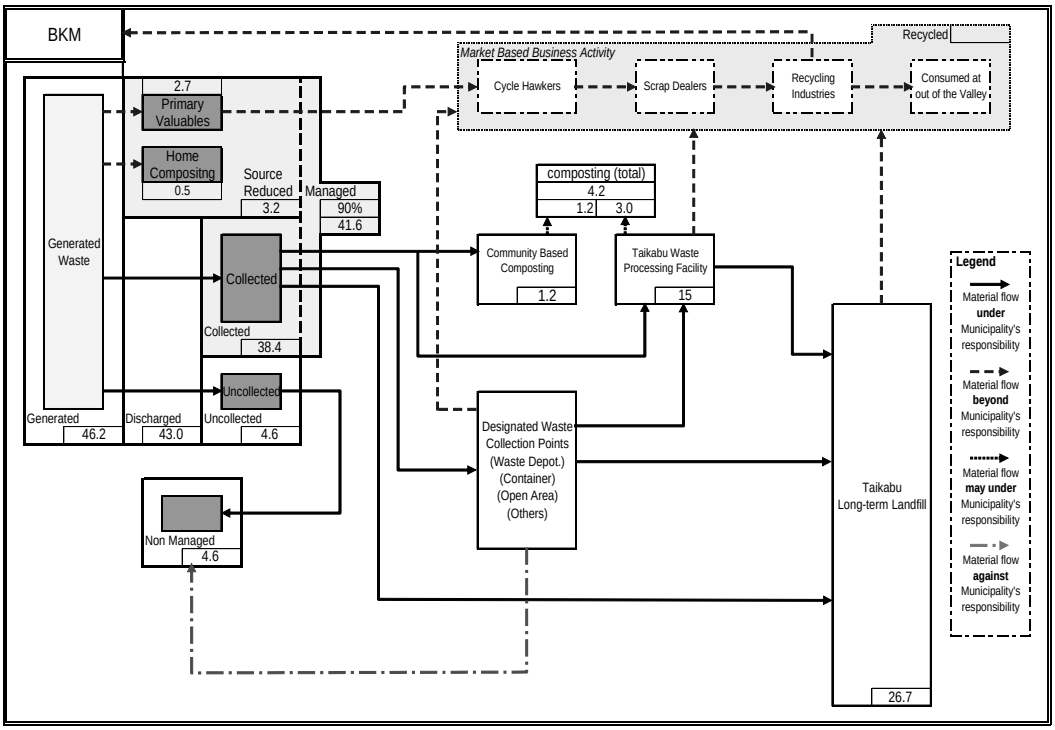
Existing Solid Waste Stream (2005)

Unit: t/day



Future Solid Waste Stream (2015)

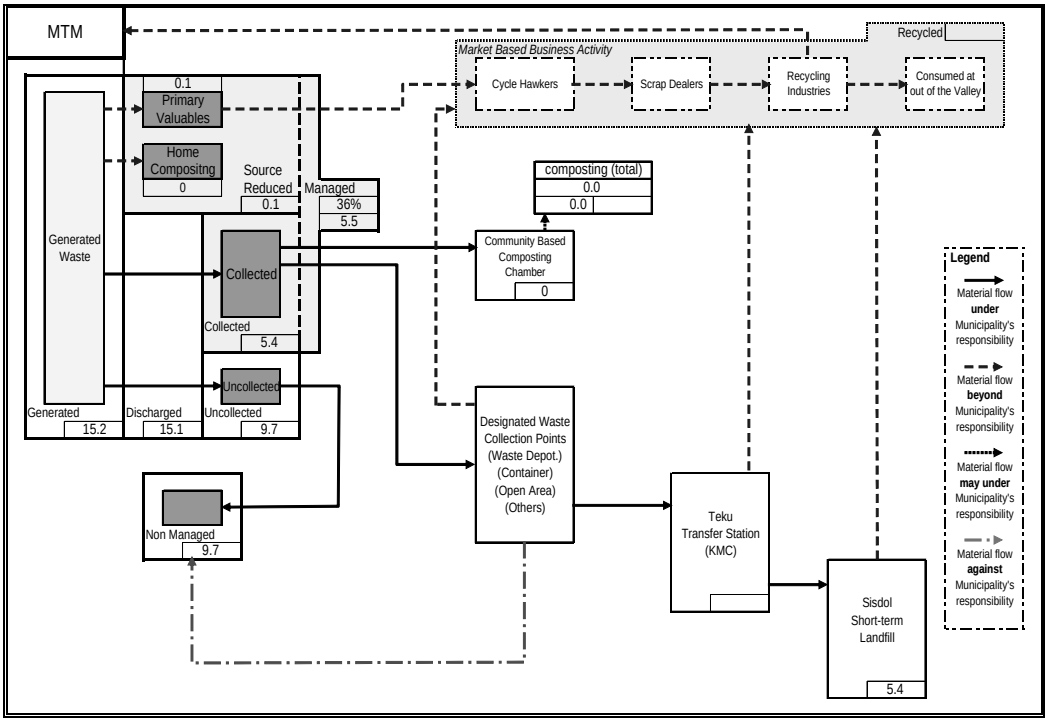
Unit: t/day



4. Madhyapur Thimi Municipality

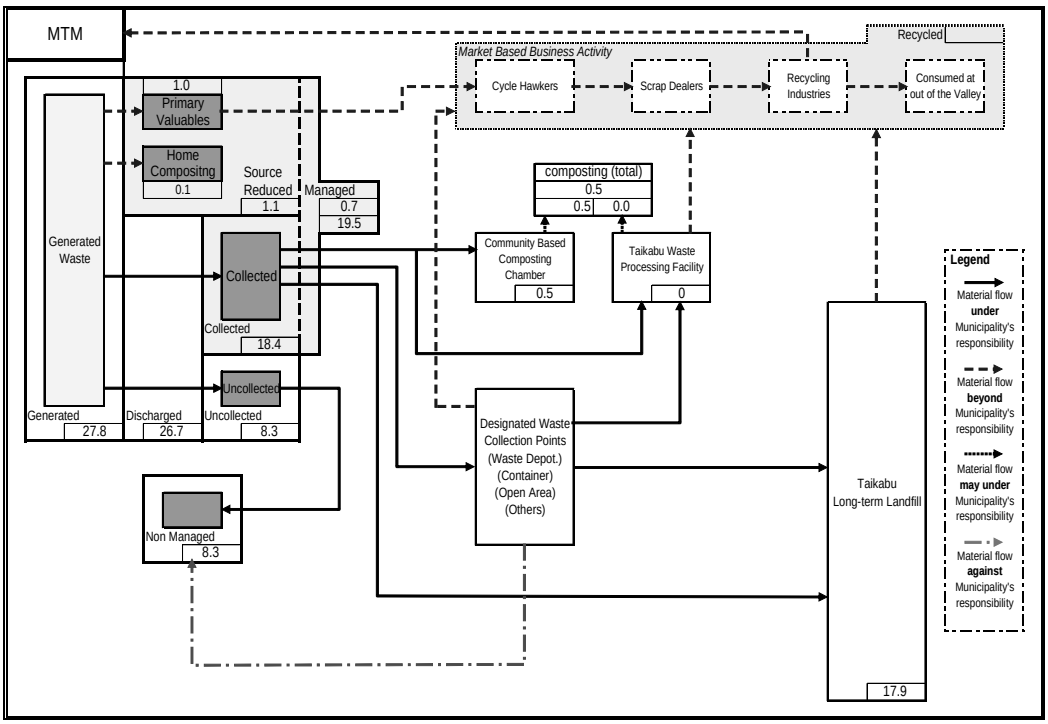
Existing Solid Waste Stream (2005)

Unit: t/day



Future Solid Waste Stream (2015)

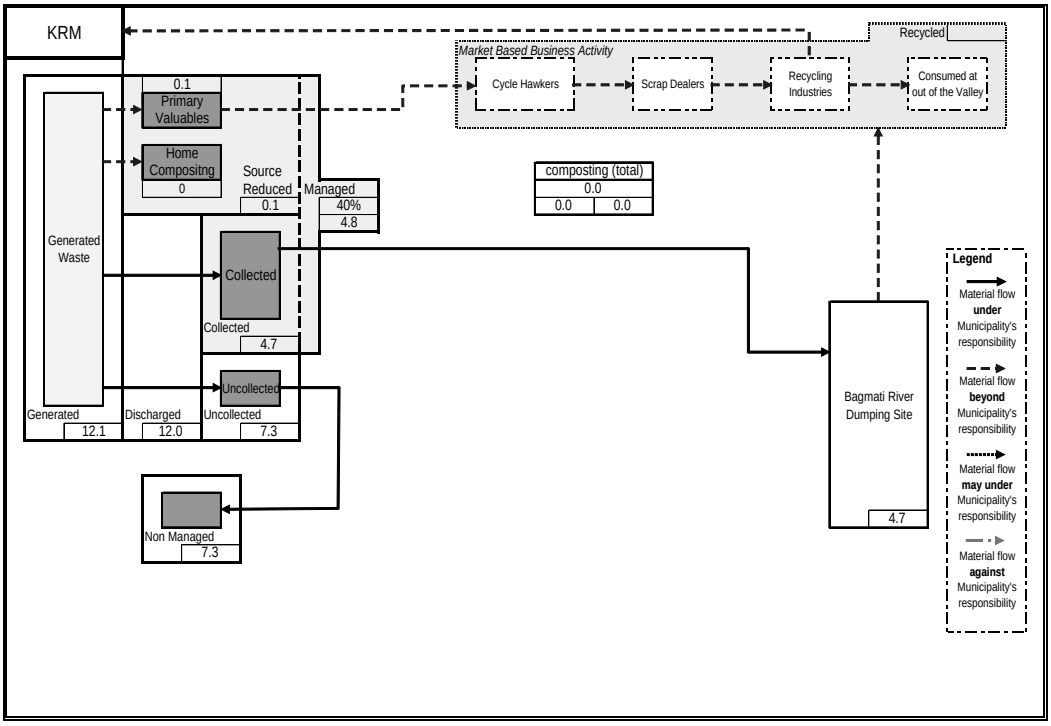
Unit: t/day



5. Kirtipur Municipality

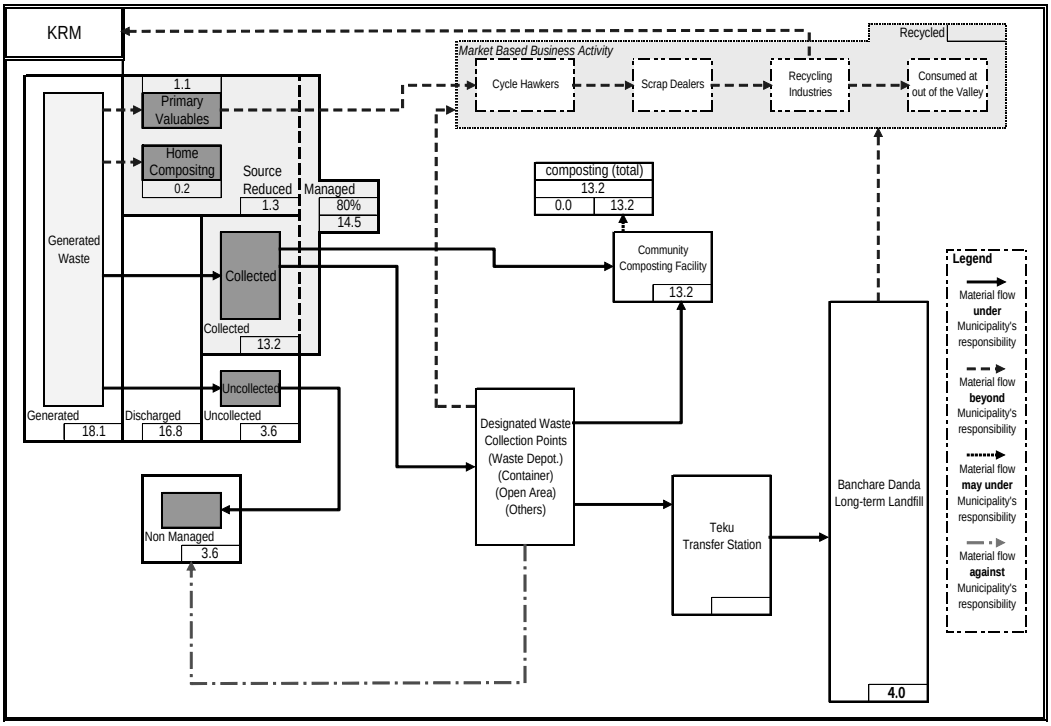
Existing Solid Waste Stream (2005)

Unit: t/day



Future Solid Waste Stream (2015)

Unit: t/day



APPENDIX 4

Selected Photo

APPENDIX 4 SELECTED PHOTO

1st Steering Committee
(January 27, 2004)

4th Steering Committee
(June 29, 2005)

3rd Seminar
(November 25, 2004)

4th Seminar
(June 27-28, 2005)

1st Public Hearing
(March, 2004)

3rd Public Hearing
(July/August, 2004)

Activities of the Study (1/2)

4th Public Hearing
(February, 2005)

Training Needs Analysis
(February, 2004)

Interview Survey to Waste Pickers
(April, 2004)

Waste Quantity and Quality Survey
(March, 2004)

TWG Meeting
(May, 2004)

Task Force Meeting
(March, 2004)

Activities of the Study (2/2)

A-1.1: Practice of Source-separated Collection in BKM (June, 2005)

A-1.2: Practice of Collection and Transportation in MTM (June, 2005)

A-3: Workshop for Transfer Station (1) (July 12, 2004)

A-3:Topography Survey in Teku (August, 2004)

A-3: Completion of Improvement of Teku T/S (March, 2005)

A-3: Operation of Teku T/S (June, 2005)

Activities of Pilot Project A

B-1: Workshop on Waste Minimization Facility (July 14, 2004)

B-1: Study Tour to India (November 7-11, 2004)

B-1: Data Collection at BKM Composting Facility (February, 2005)

B-2: Training on Composting at Model Area (February, 2005)

B-2: Vermi-Composting at Teku T/S (March, 2005)

B-2: Collected Plastic by using Suiro at KRM (March, 2005)

Activities of Pilot Project B

C-1: Study Tour to Malaysia
(September 26- October 2, 2004)

C-1: Site Visit to Pokhara
(July 24-25, 2004)

C-2: Improvement of Sisdol Landifll
-Clay Liner Work- (November, 2004)

C-2: Water Quality Survey in Sisdol
(March, 2005)

C-2: Completion of Improvement of Sisdol Landfill (December, 2004)

C-2: Operation of Sisdol Landfill
(June, 2005)

Activities of Pilot Project C

D-1: Training on Behavior Change Communication Skill (July 21-23, 2004)

D-1:Study Tour to Hetauda (September 9-11, 2004)

D-2: 2nd Public Event (April, 2005)

D-2: Clean Up Campaign (June, 2005)

D-3: Camp for Nature Clubs (September 16-18, 2004)

D-3: Workshop on Product Making from Waste for Nature Clubs (October 1-2, 2004)

Activities of Pilot Project D

E-1: Action Plan Operational Management Training (July, 2004)

E-1: Training on Monitoring and Evaluation System (August, 2004)

E-1: Training on Program Based Budgeting (September, 2004)

E-2: Training on Quantity and Quality Survey (September, 2004)

E-2: Training on Solid Waste Data Management (November 9-10, 2004)

E-3: Country Focused Training in Japan (December, 2004)

Activities of Pilot Project E