Environmental and Social Management Plan of Activities in Dhankuta Municipality

1. Project Description

- The four-year Solid Waste Management Service Improvement Plan (SWP-SIP) has been established to support the long-term strategic objectives of the Strategic Plan and address the immediate challenges within existing SWM system in Dhankuta. The objectives and targets of the SWM improvements in the four years planning period of the SWM-SIP are:

- Actual delivery of the present formal collection service level in the existing urban and peri-urban service areas;
- Increase in service area to cover some of the presently un-serviced urban and peri-urban areas off the black top roads and possibly larger rural settlements close to the existing urban areas in Dhankuta and Hile;
- Provision of a higher waste collection service level through Kerbside collection along streets where the collection trucks drive;
- Pilot scheme on ISWM including three bin source separation pilot (organic, inorganic and hazardous) and home composting pilot (households with own land), promotion of 3R and provision of training;
- Improvement of the operation of the landfill and SWM center, especially with focus on improved landfill operation;
- Institutional strengthening; and
- Increased information and raising awareness.

1.1 Introduction and Background

Population of Dhankuta municipality is 28,364 as per census 2011and the population density (person per Km2) 588. As per ADB report on Solid Waste Management in Nepal, 2013, Average household waste is 0.69 Kg/day and household size is 4.78 so average per capita household waste is 143.4 g/capita/day. From this figure the total household waste of the municipality is 4.07 tons/day. Similarly commercial and institutional constitutes 2.91 tons/day and 0.42 tons/day respectively. Based on above figure average per capita Municipal Solid Waste is 260.73 g/capita/day. Total waste generation in the municipality is 7.40 tons/day. Collection frequency varies from day to day to twice aweek in urban area considering the load. Composition of household waste constitutes organic 59.61%, recyclables 31.04% and textile, rubber/leather and other 9.34%. The basic mode of collection is mixed collection. Such of the mixed waste handling system has increased the cost of management reducing the potential value of the material mixed with waste. Although, the Health Care Institutions (HCIs) are legally mandated to manage their waste, directly/indirectly it is being mixed with municipal waste and local HCIs lack the

capacity, system and minimum infrastructures required for health care waste management. It also has exacerbated the toxicity of the waste.

The following major challenges within existing SWM system in Dhankuta have been identified (See TPIA-SWM SIP: Annex-6 for details).

- Limited collection and transportation service.

- Limited recycling and composting.
- Deficient treatment and disposal
- Inadequate Institutional set up for SWM.
- Insufficient information and awareness activities
- Financially unsustainable system.

1.2 SWM-SIP Activities

- The SWM-SIP implementation is expected to require the following investments (supported by the four year service delivery subsidy under the OBA project):
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- 1 new waste collection vehicle (most likely a small compactor truck of a type with track record from cities with similar topography) – NPR 40 Lakh
- 3,000 waste collection bins with lid – NPR 9 Lakh
- 100 bins for home composting pilot – NPR 2 Lakh
- 300 bins for three bin source separation pilot – NPR 1 Lakh
- 100 litter bins in market area – NPR 1 Lakh

The SWM-SIP implementation will furthermore require capacity building at municipality and TLOs level within the following areas (through SWMTSC supported by OBA project TA component):

- Establishing operational manual for landfill and upgrading landfill operations and management expertise;
- Improvement of billing and revenue collection systems for SWM services;
- Establishing a monitoring, evaluation and performance management systems for SWM services;
- Design and implementation of 3R activities;
- Design and implementation of IEC campaigns;
- Design of appropriate contractual arrangements for involvement of NGOs or community based organization (TLOs).

2. Environmental and Social Management Plan

Scope of Environmental and Social Management Plan: Scope covers potential impacts and mitigations related to activities supported under the OBA in Dhankuta and the activities/ aspects directly linked to the OBA support. These are summarized in Table below.

Objectives of ESMP:

The basic objectives of the EMSP are to:

- To ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project implementation and operation - pre-construction, construction and operation and maintenance;
- Recommend a plan of action and a means of testing the plan to meet existing and projected environmental and social problems;
- Establish the roles and responsibilities of all parties involved in the project's environmental and social management;
- Describe mitigation measures that shall be implemented to avoid or mitigate adverse environmental and social impacts and maximizing the positive ones;
- Ensure implementation of recommended actions aimed at environmental and social management and its enhancement; and
- Ensure that the environment and its surrounding areas are protected and developed to meet the needs of the local people, other stakeholders and safeguard the interests of the common people.

3. **Overview of ESMP (Table):**

While trying to meet the KPIs (Key Performance Indicators), SIP (Service Improvement Plan) has to be implemented with several OBA interventions in the municipality

OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
Increase in the collection service coverage	Increase in vehicular use for collection causing emission and traffic problems	– 3 Tractors for collection – Intermittent use of hired backhoe loader – No significant vehicular congestion is observed in existing – Vehicular emission does exists but increased number of vehicular movement may increase the emission	– Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle to replace existing random schedule – Door to door collection and transport to be done early morning(5:30-9:30 AM)	No Additional Cost	– Municipality for collection schedule & Route – Collection sites	1st October 2015	Environment section chief in partnership with TLOs for preparation of routes and schedules SWM Unit supervisor for collection operation and monitoring
	Spillage of waste from collection vehicles during collection and transportation causing littering of waste in the	– Spillage during HH collection – Transportation without or inappropriate covering	– Avoid rough handling during House Hold (HH) collection. – Avoid overfilling of the vehicle during collection – Cover the waste	Community Awareness Program (for 110 participants NRS 66,000);	Collection sites Transportation Routes	Regularly during collection and transportation	Solid Waste Management Unit (Supervisor)

	streets and in the nature		during transportation to avoid windblown litter – Inform households and other users about the waste collection system and the collection scheme. Encourage households and other users to put waste out at designated times and locations	Monitoring and enforcement	Landfill site		
	Health impacts on workers	– No any risk & hazard identification – No any occupational health & safety plan do exists (Limited Personal Protective Equipment (PPE), Reluctance to use PPE, No provision for regular health checkup)	– Identification of potential risks & hazards – Preparation of Occupational Health & safety plan (Train workers of appropriate handling, Provide them with all necessary PPE, Regular health check-up, Prompt medical attention for any hazards etc)	500,000 for preparation of OHS Plan	Reported cases in municipality (Environment Section) Monitoring the waste handlers during collection and treatment	1st December 2015	CEO/Environment Section (Section Chief)

	Increased amount of waste to the landfill causing increased adverse environmental and social impacts to the environment around the landfill.	– No provision of source segregation and recovery at source except animal feeding of kitchen waste. – Separation of recyclables/reusable at disposal site by private party – No any significant community issue observed	– Segregate at the source and HH level composting – Production of sellable recycle materials – Proper management of landfill site according to operation manual (this needs additional backhoe loader)	Back hoe Loader: NRS 4,000,000	Households Landfill Site	1st August 2015	Environment Section (Section Chief/Supervisor) in support of municipal engineer
Segregation of waste at each household in service area	Increase in vehicular use for separate collection of biodegradable and non-degradable waste causing emission and traffic problems	– No provision for separate collection	– Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle – Early morning Door to door collection at core urban area.	No Additional Cost	Collection Schedules/Routes prepared by Municipality Collection Points	1st October 2015	Environment section chief in partnership with TLOs
	Collection and transport of biodegradable waste in open vehicle causing spread of bad smell all along the	– No provision for separate collection	– Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle.	No Additional Cost		1st October 2015	Environment section chief in partnership with TLOs for preparation of routes and schedules

	route		– Early morning Door to door collection at core urban area – Avoid overfilling of the vehicle during collection – Cover the waste during transportation – Use of lime/Effective microorganism for smell problem in transportation				SWM unit supervisor for collection arrangement and others
Introduction of composting system at household level as well as in community level	Spreading of plastic, glass and other unwanted materials in gardens etc. by use of compost (caused by incorrect sorting of waste prior to composting)	– Very limited HH level composting	– Compost & management training – Regular monitoring system for proper handling of HH composting – Use of EM to reduce odor	Compost Training (Follow up 110 participants) NRS. 350,000	Municipal records	1st July 2015	Environment section chief for training management and preparation of regular monitoring schedules to HH in support of TLOs
	Possibility of nuisance due to improper handling (Spread of bad smell during the process of composting,	– HHs started HH level composting are reluctant to continue because of the nuisance caused by improper handling					

	Leachate)						
Reuse of waste papers and plastics for the commercial production of useful materials	Contaminated materials may be hazardous to health	– Separation of recyclables/Reusable at disposal is ongoing	– Use of source segregated material – Disinfection before use	No additional cost		1st October 2015	Private entrepreneur/NGOs in coordination of Environment section chief
Encouragement of private sector in waste segregation, reuse and recycling	Being too much commercial, they avoid to abide by the environmental protection laws and precautions	– Separation of Recyclables/Reusable at disposal is ongoing	– Improvement and operation of existing facility at landfill site as a waste recovery center – Regular and strict monitoring by municipality – Limitation and high fencing of the transfer site	No additional cost	Landfill site	1st July 2015	Environment Section Chief in support of engineer and supervisor
	Health hazard among the workers	–	– Train workers for appropriate handling and precautions	No additional cost	Municipal records	1st December 2015	Environment Section chief
Encouragement of piggery for the management of biodegradable waste	Piggery emits bad smell in the neighborhood	– Pig farming at HH level is prominent	– Use of vermicomposting for pig slurry – Improvement of piggery – Use of EM to reduce odor	No additional Cost	Field visit	1st July 2015	Environment section chief for organizing training and coordinating with TLOs
Separate collection and disposal of	Increase in vehicular use for separate	– Mixed collection of medical waste with MSW	– Mandatory Source segregation at	No additional cost	Health Care Institutions	1st December 2015	CEO for policy & coordination in support of local

medical waste	collection and disposal		source in each Health Care Institutions (HCIs) at least with three bucket system. – Separate collection of only MSW portion from the HCIs – Facilitate HCIs in establishing treatment system for infectious waste. – Separate schedule of collection from HCIs to avoid mixing of infectious (monitoring of waste composition)		During collection and transport		political parties Environment section chief for scheduling SWM unit supervisor for collection and supervision
	Health hazard to the workers	– Mix handling might have cause hazard but none of the assessment has been done	– Identification of potential risks & hazards – Preparation of Occupational Health & safety plan (Train workers of appropriate handling, Provide them with all necessary PPE,	no additional cost	Municipal records	1st December 2015	CEO/Environment Section Chief in support of Account Chief

			Regular health check-up, Prompt medical attention for any hazards etc)				
Introduction of litter bins in market area	Misuse of litter bins for household waste.	–	– Regular monitoring from TLO & municipality	No additional cost		1st September 2015	Environment section chief in support of local TLO/Community
Mandatory landfill operation	- Possibility of nuisance in community due to improper handling (Spread of bad smell during the process of segregation at disposal and final disposal itself, Leachate spillage & percolation) – Increase in vector & flies causing public health hazards – Landfill site operation blockade from local residents	– Gradually improvement is ongoing and it's in operation.	– Following the landfill operation & management guideline including formation of landfill operation steering committee including all the stakeholders assuring the local community participation, formation of local coordination committee, deputation of permanent landfill site staffs, regular covering)	No additional cost		1st March 2015	CEO/Environment Section Chief

Note: EM = Effective Microorganism; we can also use '*Jibatu*' for the same purpose.

4. **ESMP Monitoring Table**.

OBA Interventions	Potential Risks	Area	Are ESMP mitigations measures / management actions implemented and acceptable environmental and social conditions established?		Comments/ recommendations, e.g. re additional studies / information / actions required
			Yes/No	Description	
Increase in the collection service coverage	Increase in vehicular use for collection causing emission and traffic problems				
	Spillage of waste from collection vehicles during collection and transportation causing littering of waste in the streets and in the nature				
	Health impacts on workers				
	Increased amount of waste to the landfill causing increased adverse environmental and social impacts to the environment around the landfill.				
Segregation of waste at each household in service area	Increase in vehicular use for separate collection of biodegradable and non-degradable waste causing				

	emission and traffic problems				
	Collection and transport of biodegradable waste in open vehicle causing spread of bad smell all along the route				
Introduction of composting system at household level as well as in community level	Spreading of plastic, glass and other unwanted materials in gardens etc. by use of compost (caused by incorrect sorting of waste prior to composting)				
	Possibility of nuisance due to improper handling (Spread of bad smell during the process of composting, Leachate)				
Reuse of waste papers and plastics for the commercial production of useful materials	Contaminated materials may be hazardous to health				
Encouragement of private sector in waste segregation, reuse and recycling	Being too much commercial, they avoid to abide by the environmental protection laws and precautions				
	Because of use of certain area as transfer site, there will be land, water, air and visual pollution				
	Health hazard among the				

	workers				
Encouragement of piggery for the management of biodegradable waste	Piggery emits bad smell in the neighborhood				
Separate collection and disposal of medical waste	Increase in vehicular use for separate collection and disposal				
	Health hazard to the workers				
Introduction of litter bins in market area	Misuse of litter bins for household waste.				
Mandatory landfill operation	- Possibility of nuisance in community due to improper handling (Spread of bad smell during the process of segregation at disposal and final disposal itself, Leachate spillage & percolation) – Increase in vector & flies causing public health hazards – Landfill site operation blockade from local residents				