

# Environmental and Social Management Plan (ESMP)

OBA for Municipal Waste Management in  
Lalitpur Sub-Metropolitan City

July, 2015

Prepared Jointly by  
**Lalitpur Sub-Metropolitan City**  
and  
**the JV of Multi Disciplinary Consultants (P) Ltd,  
Nepalconsult (P) Ltd and DA Nepal (P) Ltd**

## **Environmental and Social Management Plan of Activities in Lalitpur Sub-Metropolitan City (LSMC) Municipality**

### **1. Introduction**

The study on Environmental and Social Management Plan of SIP Activities in Lalitpur Sub-Metropolitan City has been conducted jointly by the Municipality and the JV of Multi Disciplinary Consultants (P) Ltd, Nepalconsult (P) Ltd and DA Nepal (P) Ltd based on the Environmental and Social Management Framework (ESMF) for OBA for Municipal Solid Waste Management in Nepal.

### **2. 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 LSMC.

The objectives and targets of the SWM improvements in the four years planning period of the SWM-SIP are:

- › Collection services are provided for all households, institutions and commercials in all wards including the three new villages
- › Municipal council adopts a policy on gradual introduction of tariffs in LSMC serviced core areas and a regulation of tariffs of private operators in non-core areas
- › Appropriate contractual arrangements for waste collection, segregation and treatment by private operators is introduced including requirements for authority income share
- › Street sweeping in core area and at main streets and public areas in other areas
- › Improved operations practices at transfer and recovery sites
- › Plan for healthcare waste management prepared

Furthermore, the plan establishes ambitious targets for recovery of organic and recyclable fraction and waste for landfill over the planning period:

- › Recovery of organic waste to be increased to 40% in 2018 and 90% in 2028
- › Recovery of recyclable fraction to increase from 10% in 2014 to 40% in 2018 and 100% in 2028
- › Waste for landfill to decrease from 95% in 2014 to 62.5% in 2018 and 12% in 2028

The long term strategic objectives are well in line with the National SWM policy.

The SWM Strategic Plan and Action Plan is in line with the template developed in the OBA project in 2012.

Outside the Strategic Plan, two separate developments may significantly change the basis for SWM planning in Lalitpur:

- › As of December 2014, the government has announced a municipal reform which will include 3 VDCs (38,000 inhabitants) in LSMC, with accompanying SWM service obligations (8 new wards from 3 VDCs will require SWM services).
- › The Investment Board of Nepal on behalf of GoN is conducting a tender for a PPP on SWM and energy generation in KTM Valley (three geographically defined packages that include collection, transport and processing of all municipal solid waste as well as street cleaning and river bank clean-up as well as recovery, recycling and energy generation, with all technical options being left open to the bidders).

### **3. Major Challenges**

The following major challenges within existing SWM system in Lalitpur Sub-Metropolitan City have been identified (Please refer TPIA-SWM SIP: Annex-6 for details).

- Limited collection and transportation service.
- Limited recycling and composting
- Concerns of treatment and disposal
- Further support needed to strengthen institutional set up for SWM
- Concerns of insufficient information and awareness activities
- Formalization of Private Service Providers for SWM
- Financial sustainability of system (tariff fixation)

### **4. 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):

- › Replacement of 15 existing worn out primary collection vehicles with 10 small compactor vehicles in 1<sup>st</sup> year - 40 Lakh each
- › Increase of primary collection capacity through purchase of four new small collection vehicles for narrow roads in 1<sup>st</sup> year - NPR 13 Lakh each
- › Replacement of four existing worn out secondary collection vehicles, two large tipper trucks at the existing temporary transfer station in year 1 and two large tipper trucks at the new transfer station in year 2) - NPR 40 Lakh each
- › Improvements in temporary transfer station including removal of old worn out vehicle and establishment of simple material recovery facility (MRF) in year 1 - NPR 50 Lakh (SWMTSC will also support)
- › Front end loader at the temporary transfer station in year 1 - NPR 45 Lakh
- › New transfer station including material recovery facility (MRF) in year 2 - NPR 300 Lakh
- › Front end loader at the new transfer station in year 2 - NPR 45 Lakh
- › Loader for landfill in year 1 - NPR 80 Lakh
- › Street sweeping equipment (broomer, hand carts and small tippers for collection of sweepings) in year 1 - NPR 100 Lakh
- › Establish a construction waste management and recovery facility in year 2 - NPR 30 Lakh
- › Promote Source segregation in 15,000 household in 3 consecutive years - NPR 75 Lakh
- › Promote home composting or waste reduction from 4,000 households in 3 years - NPR 108 Lakh

### **Surveys and feasibility studies:**

- › Carry out a survey on location of hospitals and clinics and waste generation and preparation of a plan on management of medical waste
- › Feasibility study in first year of the OBA project on the establishment of MRF facilities at the existing temporary transfer station and at the new transfer station

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 segregation and transfer facility operations and management including MRF
- ✓ Introduction 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
- ✓ Assistance in development and implementation of information ad awareness campaigns for clean city and source segregation of waste
- ✓ Introduction of simple contractual arrangements for private operators in waste collection, segregation and treatment
- ✓ Possibly introduction of contractual arrangements for involvement of community based organization (TLOs) in SWM.

## **5. Environmental and Social Management Plan**

### **5.1 Scope of Environmental and Social Management Plan:**

The scope covers potential impacts and mitigations related to activities supported under the OBA in Lalitpur Sub-Metropolitan City and the activities/ aspects directly linked to the OBA support.

### **5.2 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.

## 6. Overview of ESMP:

While trying to meet the KPIs (Key Performance Indicators), SIP (Service Improvement Plan) has to be implemented with several OBA interventions in the municipality. Following OBA interventions and related mitigation measures have been planned in relation to the existing status and potentials improvements in the Lalitpur Sub-Metropolitan City;

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	<ul style="list-style-type: none"> <li>- 1 tractor, 12 tippers, 2 dumper placers and 4 secondary vehicles in operation; and 6 trucks, 1 mini-truck, 12 tractors and 4 trailers operated by private sectors</li> <li>- Major concerns of vehicular emission does exist but increased number of vehicular movement may increase the emission</li> </ul>	<ul style="list-style-type: none"> <li>- Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle to replace existing random schedule</li> <li>- Proper information dissemination</li> <li>- Door to door collection and transport to be done early morning (5:30-9:30 AM)</li> <li>- Grievance Redress Mechanism will be in function</li> </ul>	As per SIP intervention, 10 waste collection compactor vehicles, 4 small tractors/trailers and 2 large tippers - NPR 61,200,000	<ul style="list-style-type: none"> <li>- Municipality for collection schedule &amp; Route</li> <li>- Collection sites</li> </ul>	<p>Extended collection target for existing wards planned for 4 years, and for 3 new VDCs started in the Year II</p> <p>10 compactor vehicles and 4 new small collection vehicles in Year I</p> <p>Replacement of 4 existing secondary vehicles and 2 large tippers at temporary transfer station in Year I</p> <p>2 large tipper trucks at the new transfer station in Year II</p>	<p>Environment and Sanitation Section in partnership with TLOs for preparation of routes and schedules</p> <p>Environment and Sanitation Section for collection operation and monitoring</p>
	Spillage of waste from collection vehicles during	<ul style="list-style-type: none"> <li>- Spillage during HH collection</li> <li>- Transportation without or inappropriate covering in</li> </ul>	<ul style="list-style-type: none"> <li>- Avoid rough handling during Household (HH) collection</li> <li>- Avoid overfilling of the</li> </ul>		Collection sites	Regularly during collection and transportation	Environment and Sanitation Section - LSMC

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OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
	collection and transportation causing littering of waste in the streets and in the nature	the vehicle	vehicle during collection <ul style="list-style-type: none"> <li>- Cover the waste during transportation to avoid windblown litter</li> <li>- Inform households and other users about the waste collection system and the collection scheme.</li> <li>- Encourage households and other users to dispose waste at designated times</li> </ul>		Transportation Routes  Landfill site		Private operators
	Health impacts on workers	<ul style="list-style-type: none"> <li>- Risk &amp; hazard for informal waste collectors</li> <li>- No any occupational health &amp; safety plan exists (Limited Personal Protective Equipment (PPE),</li> <li>- Reluctance to use PPE, No provision for regular health checkup)</li> </ul>	<ul style="list-style-type: none"> <li>- Identification of potential risks &amp; hazards</li> <li>- Preparation of Occupational Health &amp; safety plan (Train workers at all working fronts, Provide them with all necessary PPE, Regular health check-up, Prompt medical attention for any hazards etc)</li> <li>- Pre-screening of health of swm workers</li> <li>- Health Insurance for waste workers</li> <li>- Make use of small operating face so that risks are minimum</li> </ul>	NPR 500,000 for preparation of OHS Plan PPEs - NPR 2,800,000 NPR 500,000 for trainings	Reported cases in municipality (Environment Section)  Monitoring the waste handlers during collection and treatment  Collection centers, transfer stations operated by private operators	Year 1 onwards for Occupational Health & Safety Plan Preparation  1 set of PPEs per waste worker per year (for 4 years)  Trainings in each year	Environment and Sanitation Section in LSMC  Private operators

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OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
	Increased amount of waste to the landfill causing increased adverse environmental and social impacts to the environment around the landfill.	<ul style="list-style-type: none"> <li>- Limited segregation at HH level</li> <li>- Limited and unmanaged separation of recyclables and reusable at the landfill</li> <li>- No any significant community issue observed</li> </ul>	<ul style="list-style-type: none"> <li>- Intensely promote segregation at the source and HH level composting</li> <li>- Production of sellable recycle materials</li> <li>- Proper management of landfill site according to operation manual</li> <li>- Optimal use of cover soil</li> </ul>		Landfill Site and its surrounding areas		Environment and Sanitation Section (Section Chief/Supervisor) in support of municipal engineer
Introduction of composting system at household 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)	<ul style="list-style-type: none"> <li>- Limited HH level composting</li> </ul>	<ul style="list-style-type: none"> <li>- Compost &amp; management training (<i>GESI sensitive approach</i>)</li> <li>- Regular monitoring system for proper handling of HH composting</li> <li>- Garden or Roof top composting facilities, vermi-compost for example appropriate</li> </ul>	4,000 bins for home composting - NPR 108 Lakh Compost Training (Follow up 250 participants) NRS. 200,000 For Social Mobilizers: as NPR 200,000	Municipal records	Year I and onwards	Environment Section and Sanitation Section for training management and regular monitoring at community level in support of TLOs
	Possibility of nuisance due to improper handling Spread of bad smell during the process of composting, Leachate	<ul style="list-style-type: none"> <li>- HHs started HH level composting are reluctant to continue because of the nuisance caused by improper handling</li> </ul>	<ul style="list-style-type: none"> <li>- Use of EM to reduce odour</li> <li>- Training on EM production/promotion</li> <li>- Regular Monitoring (through a social mobilizer - at least for 1 year)</li> <li>-</li> </ul>		Municipal records	Year I onwards	

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OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
Source segregation and collection of segregated waste	Increase in vehicular use for separate collection of biodegradable and non-degradable waste causing emission and traffic problems	<ul style="list-style-type: none"> <li>- Segregation already initiated</li> <li>- No provision for separate collection</li> </ul>	<ul style="list-style-type: none"> <li>- Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle</li> <li>- Early morning Door to door collection at core urban area.</li> <li>- Awareness campaign on Source Segregation of solid waste in HH/community level</li> <li>- Reward mechanism for those who do segregation at HH (subsidization of tariff etc.)</li> </ul>	Cost of segregation campaigns and provisions: NPR 5,000,000	<ul style="list-style-type: none"> <li>Collection Schedules/Routes prepared by Municipality</li> <li>Collection Points</li> <li>HH level monitoring</li> </ul>	Year I and onwards	Environment and Sanitation Section in partnership with TLOs
	Collection and transport of biodegradable waste in open vehicle causing spread of bad smell all along the route	<ul style="list-style-type: none"> <li>- Segregation already initiated</li> <li>- No provision for separate collection</li> </ul>	<ul style="list-style-type: none"> <li>- Use of well-planned schedule considering the volume of waste reducing unnecessary movement of vehicle.</li> <li>- Early morning Door to door collection at core urban area</li> <li>- Avoid overfilling of the vehicle during collection</li> <li>- Cover the waste during transportation</li> <li>- Use of microbial formulations for smell problem in transportation</li> </ul>	No significant additional cost	<ul style="list-style-type: none"> <li>Municipality</li> <li>Collection Points</li> <li>HH level monitoring</li> </ul>	Year I and onwards	Environment and Sanitation Section in partnership with TLOs

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OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
Establish a construction waste management and recovery facility	Increase in vehicular use for separate collection and during processing of the construction waste, and health concerns of workers	<ul style="list-style-type: none"> <li>- Mixed during collection of MSW</li> <li>- So mixed disposal</li> <li>- Some private parties have started construction waste management/recovery works</li> </ul>	<ul style="list-style-type: none"> <li>- Separate collection of construction wastes</li> <li>- Operational Manual to be developed for construction waste management and recovery center</li> <li>- Proper area demarcation, fencing and management</li> <li>- Special provisions to reduce noise and dust nuisance</li> <li>- PPEs and medical facilities to workers in the recovery center</li> </ul>	NPR 30 Lakh	<p>The construction waste management and recovery center</p> <p>Surrounding environment (feedback from local communities)</p> <p>During construction and operation phases</p>	In year II	Environment and Sanitation Section and Private partnership is potential
Improvement in temporary transfer station	<ul style="list-style-type: none"> <li>- Possibility of nuisance in community due to improper waste handling (Spread of bad smell during the process of segregation at disposal and final disposal itself, Leachate spillage &amp; percolation)</li> <li>- Increase in vector &amp; flies causing public health hazards</li> </ul>	<ul style="list-style-type: none"> <li>- Gradually improvement is ongoing at the temporary transfer station</li> </ul>	<ul style="list-style-type: none"> <li>- Development of an operation manual for temporary transfer station</li> <li>- Training the workers in safer waste handling practices</li> <li>- Improvements in existing components/system</li> <li>- Replacement of worn out old vehicles</li> <li>- Inbuilt small MRF in the temporary transfer station</li> </ul>	NPR 5,000,000 for improvement in temporary transfer station	<p>Municipal records, field visit</p> <p>Records from MRF in the temporary transfer station</p>	Year I onwards	Environment Section and Landfill Section / LSMC

OBA Interventions	Potential Risks	Existing Condition	Potential Mitigation Measures	Budget	Verification Source/Location to Monitor	Implementation Schedule	Responsibility
	- Leachate can damage nearby land and nearby water bodies						
Construction of new transfer station with MRF	- Safety concerns - Noise and dust - Nuisance to surrounding environments	- No separate transfer station - No separate MRF - Using combined facility with KMC	- Proper area allocation for transfer station and proper fencing/demarcation - Maintaining of greenery - Control over spreading of segregated waste and residue - Safety measures will be specifically developed for transfer station and its MRF	NPR: 30,000,000 for transfer station and a MRF within the transfer station	Municipality's progress reports  Supervision and monitoring reports	Year II onwards	Environment and Sanitation Section  Lalitpur Sub-Metropolitan City
	- Pollution of nearby water bodies						
	- Concerns of OHS for construction workers		- Provisions of PPEs, specific guidelines to work within new transfer station and its MRF				

**Notes:**

Note 1:

*The site for transfer station and the details of MRF have not been available. So based on the detail design and components, specific Environmental Management Plan (EMP) should be prepared by LSMC. Land pollution, air pollution, water pollution, noise nuisance, and aesthetic indicators need to be considered along with other concerns.*

Note 2:

*Year I will mean FY 2072/73, and successive years will be successive FYs accordingly.*

**ESMP Monitoring format**

Date of Monitoring .....

Data Collected By: .....

Verified by: .....

Approved by: .....

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.				
Promotion of HH composting	Improper composting causing spread of unwanted residue in garden and orchard Spread of foul order due to improper HH composting				
Source Segregation and Collection of segregated waste	Increase in vehicular use for separate collection of biodegradable and non-degradable waste				

from households in service areas	causing emission and traffic problems				
	Collection and transport of biodegradable waste in open vehicle causing spread of bad smell all along the route				
	Because of use of certain area as transfer site, there will be land, water, air and visual pollution				
	Health hazard among the workers				
Establish a construction waste management and recovery facility	Environmental Pollution, noise nuisance Workers' health concerns				
Improvement in existing temporary transfer station with a small MRF	<p>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 &amp; percolation)</p> <ul style="list-style-type: none"> <li>- Increase in vector &amp; flies causing public health hazards</li> <li>- Leachate can damage nearby water/land</li> </ul>				
Construction of new transfer station with a MRF	<p>Safety concerns for construction workers involved in construction of new transfer station and a MRF</p> <ul style="list-style-type: none"> <li>- Problems of noise and dust</li> <li>- Pollution of nearby water bodies</li> <li>- OHS concerns need to be observed</li> </ul>				