

2018/19

# Annual Report



**Leadership for Environment and Development Nepal**

**Bakhundol, Lalitpur**

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# Chapter I: About LEAD Nepal

## I.1 About Leadership for Environment and Development (LEAD) Nepal

In 2004 a small group of people with diverse background and work experience got together, united by the belief that we can develop a sustainable economy strengthening the ecosystem services delivery that works for the people and the earth that we live in. With this belief and drive Leadership for Environment and Development Nepal (LEAD Nepal) a non-profit organization was registered with the government of Nepal in 2004 (Registration#: 334/061/62; PAN #: 302893166; Affiliated in the Social Welfare Council Affiliation #: 26846)

### I.2. Vision:

A just world with sustainable economic growth harmonizing the capacity of the earth's ecosystem services and contributing to organic products for food security, nutrition, health and enhance livelihood by 25%.

### I.3. Mission:

- Dedicate to improve the quality of life in a way that protects and restore earth's environment and its services so as to provide the needs and aspiration of current and future generations  
Our Objectives
- Protect, promote and reinforce the ecosystems for incessant delivery of its services in terms of organic agriculture, agro-forestry, watershed management, animal husbandry, renewable energy, deforestation, and biodiversity;
- Reduce carbon footprints by addressing rural and urban consumption pattern focusing in resource efficiency and reducing holistic waste;
- Mainstream women, children, elderly and indigenous groups during the planning, designing and implementing phase of the projects through all levels;
- Obtain social justice and green economic growth.

### I.4. Our Values

LEAD Nepal to support its mission depends on the ability of its staff to uphold and promote the highest standards of ethical and professional conduct. We are personally and collectively responsible for maintaining the standards listed below:

- **Inclusive** and **nonpartisan** approach in all stages of the programme including staffing;
- Work in **partnership** with government, NGO's, business houses, farmers, forest users groups, rural & urban community based organizations, academicians and the international communities with **respect and dignity**;
- Strive to apply donor's funds to the highest standards of **accountability**;
- Create **environmental solutions** that make a lasting difference;
- **Innovative approach** when designing and using a wide range of problem-solving tools;
- Embrace **ambitious environmental goals** while taking into account real world dynamics;

- Devote to **Impact Investment** by reflecting the ecosystem services provided are equitably spread to all social growth

## **1.5. Areas of work:**

### **1.5.1. Green Economy**

The Green economy aims at sustainable development without degrading the environment. The 2011 UNEP Green Economy Report argues, “that to be green, an economy must not only be efficient, but also fair. Fairness implies recognizing global and country level equity dimensions, particularly in assuring a just transition to an economy that is low- carbon, resource efficient, and socially inclusive”.

One of Lead Nepal’s core mandates is to uplift the living standard of marginalized group by increasing their income by 25%. This is achieved by introducing innovative healthy approach towards self-sustainability at the same time creating income-generating activity and linking producers and business entity to build a safe and healthy environment for today and the future. LEAD Nepal, tries best to promote pro-equity interventions in its entire program so as to achieve fairness during the process of a green economy. Few of the examples are stated below:

#### **a) Organic Farming**

By 2014, Lead Nepal has build the capacity of 3800 farmers family and directly linked them to business centers who sell their products to many outlets within and outside Nepal. Organic Mountain Flavor Pvt. Ltd. alone exported 297 tons of ginger in 2014. LEAD Nepal’s five year plan (2020) is to enhance the capacity of 36000 more farmers covering an area of 9000-hector farmland between the elevation of 300 to 3700 meter, increase their yield by 25%, acquire organic certificates and directly link them to business houses. Currently, LEAD Nepal is exploring export market opportunities.

#### **b) Agro-Eco Village**

Lead Nepal has converted Sankhu Palubari village into an agro-eco village and income made from their products run the community school and cultural function.

#### **c) Waste Management**

Waste diversion is another green economy that Lead Nepal is involved in. The first step towards it was converting urban waste to organic compost, which became a lucrative business. Currently, LEAD Nepal is working towards waste to energy and is assisting the SWMTSC, Ministry of Local Development, in preparing zero waste strategy for Solid Waste Management, for Kathmandu.

#### **d) Wetland Project**

Products such as bamboo baskets, mats and natural fiber products are another green economy introduced and about 100 women in Tapuksohi, were empowered on macramé knotcraft.

### **1.5.2. Wastes Management**

Waste has significant impact on ecosystem and pose threats to human health and wellbeing. Waste also threatens the integrity of habitats that are essential to biological diversity. The challenge is to develop responses to waste issues that can improve the quality of human life and biodiversity. [1]

LEAD Nepal aims to reduce reuse and recycle (3R) waste, with minimum waste going to landfill. LEAD Nepal jointly with other NGO’s and PPAP conducted research and organized workshops on waste management in and outside Kathmandu valley.

In 2009, LEAD Nepal with partnership with Solid Waste Management Recovery Center, Ministry of Local Development Nepal, conducted a research on Zero Waste Management Project for Kathmandu and Lalitpur District in Nepal. LEAD Nepal based on its research extended its service to prepare the technical proposal for Integrated Solid Waste Management of Kathmandu Valley with BOT model on zero waste concepts.

### ***1.5.3. Disaster Waste Management***

In 2008, LEAD Nepal with support from Nepal Eco-tech Pvt. Ltd. did a research on Earthquake Hazard Management. Further, in response of the earth quack on 25 April 2015, Ministry of Federal Affairs and Local Development (MoFALD) jointly with Lead Nepal support by UNEP conducted a research on Disaster Waste and have prepared the Disaster Waste Management Policy, Strategy an Action Plan for Nepal. LEAD Nepal has conducted several workshops locally and have travelled internatinally representing Nepal on issues related to Disaster Waste Management

Nepal jointly with Karuna Shechen, has assessed the situation on 12 earth quack affected districts and is working on disaster waste management in the field level

### ***1.5.4. Soil Protection***

Protecting forests and trees are essential for warding off environmental degradation and rural poverty. In spite of the significance of forests and tree-based resources, present trends are not encouraging. Forest resources continue to be poorly managed and not used rationally. Deforestation mainly occur due to clearing for agriculture in areas not suitable for this purpose, fire wood collection, and urban and infrastructure development.

LEAD-Nepal, participated in planting tree, shrubs, bamboos in areas prone to land slide. In some areas terrace farming was promoted in order manipulates the water flow preventing from gathering speed and washing soil from farmlands. Contour farming was also implemented since crops planted parallel to the land slow the flow of water that prevents soil erosion, in open land trees and shrubs were planted as windbreakers which prevent soil erosion by slowing the force of the wind over open ground. Wetlands were also restored which is one of the most effective ways to prevent soil erosion. Wetlands act as natural sponges, absorbing rainwater and preventing it from carrying the soil away. They also provide a habitat for birds and other wildlife and help prevent water pollution. We also planted mixture of grasses, shrubs and trees as buffer strips along stream banks which helped hold stream banks intact during times of flooding.

### ***1.5.5. Agro-forestry and Watershed Management***


Agroforestry systems protect crops and forage, increase their production, protect soil and water resources, conserve energy, improve ecosystem “richness”, create additional wildlife habitat, and increase landscape diversity. They also provide additional farm or ranch products: timber, pulpwood, firewood, posts, fruit, nuts, and fodder to name a few. Agroforestry represents a collection of multipurpose practices that are enduring and help achieve sustainable agriculture.[1]

Increase damage of agriculture is competing with forest-based livelihood. While it can offer hope for short-term poverty eradication, agriculture expansion can damage the natural services that woodlands provide to local community.

Encouraging farmers to grow indigenous verities of trees and shrubs in combination with crops or forage. Also include tree and shrub plantings on the farm that improve habitat value or access by humans and wildlife, or that provide woody plant products in addition to agricultural crops or forage. Currently, LEAD Nepal is working on 12 earthquake-affected districts in capacity building of the locals on efficient use of agro-forestry while protection and restoring ecosystems services for incessant delivery of its services.

### ***1.5.6. World Mountain Product Branding***

The world mountain people’s voice and hard work needs to be heard. Their experience, challenges and lessons learned have to be shared within the mountain people for a result-oriented solution. As a result, The World Mountain Product Association (WMPA) and World Mountain Product Branding as a wing was formed out of the World Mountain Forum held at UNESCO (Paris) and in Chambéry (Savoie – Alps) in June 2000 on the initiative of the National Association of Elected Officials of the Mountains (ANEM).



The international brand for mountain produce will give a platform to acknowledge and recognize the different products produced by the world mountain people and will improve the economy of these regions promoting their ideas and culture. Their experience sharing will lead to the creation of a network of mountain people, which can then be coordinated at an international level by WMPA. This global branding will act as an umbrella brand for specific mountain region or particular mountain product.

LEAD Nepal is working with farmers in Upper Mustang for the organic certification and has secured approval from WMPA for branding it as World Mountain Product. WMPA will market the products internationally on behalf of the farmers in Mustang.

#### ***1.5.7. Facilitation of Organic Certification Process***

As a consumer, how can you tell whether a product is truly organic? Today, as consumers become more aware and responsible about what they eat and drink, there is an increasing interest in, and consequently a rising demand for, organic products. Therefore, Organic certifications have been put in place to provide the consumer with confidence in the product they buy.

Lead Nepal on behalf of the farmers have facilitated the process of organic certification with leading organic certification institutes and currently is in the stage of an internal inspection process.

Lead Nepal has imparted workshops and on the job training on the stages of conversion to organic farming. Workshops on monitoring and evaluation on the conversion to organic farming were provided, as it is a core requirement for the successful output. Currently Lead Nepal is in the process of acquiring organic certification for Upper Mustang region and the region around Surkhet.

Search for:

#### ***1.5.8. Organic Farming***

It is a proven fact that organically managed soils can convert carbon from a greenhouse gas into a food-producing asset. It's nothing new, and it's already happening, but it's not enough. Organic food is healthier, better for farmers' livelihoods and does not destroy the ecological balance.

Rising temperatures, decreasing water availability and un-organic methods of agriculture in the long run reduce the yields particularly in developing countries where agriculture is vital for food security. Therefore, agriculture must also adapt to changes in climate in order to provide food security.[1]


Organic agriculture has considerable potential for reducing emission of greenhouse gas and generally requires less fossil fuel per hectare and kg of produce due to avoidance of synthetic fertilizers. Since 2004, Lead Nepal has relentlessly worked on promoting organic agriculture that aims at improving soil fertility and nitrogen supply by using crop rotation system. The enhanced soil fertility leads to stabilization of soil organic matter and in cases to a sequestration of carbon dioxide into the soil. This in turn increases the soil's water retention capacity, thus contributing to better adaption of organic agriculture under unpredictable climatic conditions with higher temperatures and uncertain precipitation levels. Thus small and large organic farming is essential to restore our food, livelihood and health security while mitigating ecological balance.

### ***1.6. Approach of Work***

#### ***1.6.1. Private-Public-Academic Partnership***

To make a larger impact for a safe and healthy ecosystem plus economic viability, multi functional partnership including government and international communities are cornerstone of LEAD Nepal's working strategy.





We try our best to work with socially responsible business sectors that respect and understand ecosystem services not only of its broad impact, but also because of its power to spur innovation, influence supply chains, inform consumer choice, and shape public policy.

At the grass root level, Lead Nepal works with the community mobilizers, community based organizations (CBOs), mothers and youth groups, village school forest users group, media house and VDC who were instrumental in creating awareness and inspiring the community in understanding the ecosystem services consequently motivating them to protect, prevent and mitigate the ecosystem and its services. Further, these groups jointly with the university students, professors and business house and LEAD Nepal conducted base line surveys, researches and progress status on different wings of the ecosystem services. Lead Nepal help build the capacity of 3800 farmers, 10 mothers group, 10 Cooperatives, 9 youth groups, 6 Community schools, 8-forest users groups and selected students from 3 universities. Seventy percent of the target groups are females from diverse ethnic groups and many holding leading positions. By 2020, Lead Nepal plans to directly reach 36000 farmer HH's covering an area of 9000-hector farmland between the elevations of 300 to 3700 meter.

The start of private sector partnership was in 2006, whereby LEAD Nepal with its mandate linked The Organic Village presently known as The Organic Valley (TOV) with the farmers. With the support of LEAD Nepal the organic products were examined and an MOU signed, followed by establishing a processing unit in Kathmandu for packaging and processing of organic products. By end 2007 the organic spices and grains were showcased in leading departmental stores in Kathmandu.

### ***1.6.2. Reinforcing the Ecosystem***


**Sustainable Agriculture:** LEAD Nepal with the support of WWF Nepal assisted in a baseline survey of illegal wildlife trade in Mustang Valley and is currently involved in another project in Upper Mustang. The work scope involves promoting farmers to grow organic seeds and grains; empower them holistically in organic way of life; acquire organic certificates; establish an industry and market their product in the attempt to secure a healthy and comfortable life as well as mitigate climate change in a sustainable manner. The entire project is gender sensitive and inclusive in nature. LEAD Nepal is in partnership with TOV and the project is funded by WWF, Nepal.

LEAD Nepal to promote the right of education particularly for girl children successfully developed Suntol VDC, Sankhu Palubari, Bishambhara village into an Agro-Eco Village (going organic from school to home). LEAD Nepal trained the villagers on organic farming, water shed management and organic way of living and the surplus income generated from their products were used to run their village school and community programmes. This programmed became a success with the full support of District Agriculture Development Organization (DADO) and the community of Sankhu village.

Lead Nepal with its specialization on organic farming has worked as consultant all over Nepal and with its techniques of organic growth promoters, organic composting and organic pest management have build the capacity of numerous farmers.

**14bOrganic Coffee:** Lead Nepal, build the capacity of about 220 farmers on organic coffee plantation in six districts namely Illam, Kaski, Sankhuwasabha, Parbat, Lamjung and Nuwakot. The production capacity in these districts is about 100 tons of green beans per annum but currently only 15 tons are being produced. LEAD Nepal is exploring recourses to expand the training to 300 more farmers and acquire organic certification for the full utilization of the land available and uplift the living standards of the farmers.

**Wetland Project:** LEAD-Nepal jointly with TOV empowered 100 women in Tapuksohi, Nepal on macramé knot craft. Products such as bamboo baskets, mats and natural fiber products were designed and marketed in Nepal. The aim was to ensure maintenance and enhancement of wetland biodiversity and environmental goods and services for improved local livelihood in Nepal. The project objective was to



strengthen national and local capacity in ecosystem management and sustainable use of wetland biodiversity in the Koshi Tappu wild life reserve area.

### ***1.6.3. Rural and Urban Environment Management***

Waste Management is another arena where we have made a difference. We started with serious of research and awareness programmes in and outside Kathmandu valley on reducing waste from source and waste diversion programmes. During 2004, the concept of waste to sustainable economy was unthought of by the government and the civil societies but with continues awareness programmes, today its become a viable business. Lead-Nepal went to the extend of reaching out not only to the government and civil societies but aimed at school children who then would transfer their knowledge to friend and families. LEAD Nepal was the first to convert urban waste to organic compost. Supported by Jordan Foundation and Government of Nepal Solid Waste Management and Resource Center created training manuals conducted training on waste management at source.

In 2009, LEAD Nepal with partnership with Solid Waste Management Resource Center, Ministry of Local Development Nepal, conducted a research on Zero Waste Management Project for Kathmandu and Lalitpur District in Nepal. LEAD Nepal based on its research extended its service to prepare the technical proposal “Integrated Solid Waste Management of Kathmandu Valley (Package 1; Public-Private Partnership in BOT Model)”. Lead Nepal also conducted a feasibility study on waste to energy for Kathmandu Valley with the support of Communication & Bioste Company, Finland. Currently, Lead Nepal is part of the research and advisory team for preparing the detailed project report on zero waste management for Kathmandu Valley.

Further, On 12 July 2015 LEAD Nepal signed MOU with Karuna Shechen to work as a response team for the relief, rehabilitation and restoration program in 12 earthquake-affected districts. [1] A base line study jointly conducted by Karuna Shechen and LEAD Nepal identified the potential risk for girl child trafficking and sexual and gender-based violence (SGBV). Hence the core reason for the intervention is to mitigate girl child trafficking and SGBV. LEAD Nepal believes that restoring social justice and introducing green economy, simultaneously creating awareness on the right of the child, CEDAW and gender sensitive actions with its protection and response mechanism will help mitigate SGBV. LEAD Nepal is also working with INHURED for the rights based approach. Currently LEAD Nepal work scope involved a) watershed replenishment, maintenance and management; b) bio forestry c) sustainable farming, d) kitchen gardening e) organic composting and pest management; f) animal husbandry; g) crop storage technology; h) cash crop cultivation & i) awareness on SGBV j) reconstruction of schools.

## Chapter 2: Major Initiatives Executed During the FY 2018/19


### 2.1. Waste and Climate Change Project

#### 2.1.1. About the Project:

Waste management is one of the most pressing urban challenges. Cities in Nepal are no exception, both national and local authorities face considerable challenges in managing waste. Yet, managing solid waste is still not on a priority of local municipalities as the demand for other public services is much higher in many municipalities in Nepal (ADB 2013). Most of the waste generated in cities in Nepal is poorly handled where waste often ends up in the open dumpsite. Open burning of waste is also prevalent. These malpractices together with the poor condition of waste handling equipment and old and rundown transportation vehicles (carbon-based fuel used) lead to emissions of the greenhouse gases (GHGs) and short-lived climate pollutants (SLCPs) often linking the waste sector to the climate change phenomenon. To strategically tackle the solid waste management challenges, Nepal has ratified national Acts and local Declarations. The Solid Waste Management Act (SWMA) 2011 is one of the regulatory efforts. Nepal has also identified the reduction of GHG emissions and adopting a low-carbon development pathway through its Climate Change Policy and (Intended) Nationally Determined Commitments (I/NDCs). Nonetheless, there are various degrees and layers of policy, institutional, technology and financing challenges in achieving the waste and climate change objectives. Realizing these baseline scenarios, it was felt necessary to strengthen the capacity of policy makers and practitioners to tap unused potential of mitigating GHGs and SLCP emissions generated from the waste sector by developing an evidence-based policy, enabling regulatory framework, innovative financing mechanisms and adoption of the environmentally sound technologies (ESTs) for pursuing sustainable waste management efforts in Nepal.

The implementation of the project titled “Strengthening the capacity of policymakers and practitioners in Bhutan, Mongolia, and Nepal to reduce GHGs and SLCPs from the waste sector, based on the circular economy concept (the WCC project) is hence expected to make the linkages with waste and climate change and work towards achieving sustainable waste management while exuberating climate co-benefits. The WCC project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) International Climate Initiative (IKI), and the United Nations Environment Programme International Environmental Technology Centre (UNEP IETC). The WCC is a four-year (Aug 2017 - Aug 2021) project with multiple partners involving government actors, non-governmental organization, the private sector, and civil society working towards sustainable waste management. In Nepal, the Ministry of Federal Affairs and General Administration (MoFAGA) is the government partner institution, and the Leadership for Environment and Development (LEAD) Nepal - a nongovernmental organization is the executing partner that will oversee the overall project management activities and report to the UNEP IETC. The overarching goal (or outcome) of the WCC project is to capacitate key actors (policymakers and key waste sector stakeholders) to implement enhanced legislative formworks, creating enabling conditions for the introduction and uptake of suitable environmentally sound technologies (ESTs) in the waste sector, while contributing to the achievement of the pledged (intended) nationally determined commitments (I/NDCs) and towards SDGs through four work packages;

- I. WP1: Policy design and development of integrated waste management strategies,

- 
- II. WP2: Technology: identification of suitable ESTs to mitigate GHGs and SLCPs emissions from the waste sector,
  - III. WP3: Finance: development of bankable project proposals for the demonstration of the ESTs, and
  - IV. WP4: Awareness: communication strategy and plan and awareness raising packages

#### **Activities:**

#### **2.1.2. International Trainings/Seminars/Conferences organized/attended**

Regional training on achieving international climate change commitments in the waste sector in Bhutan, Mongolia and Nepal in Bangkok, Thailand has been organized in December 2017 with the participation of experts from Ministry of Environment, MoFAGA and Solid Waste Management Technical Support Centre (SWMTSC).

##### **2.1.2.1. ISWA Congress**

The Congress is jointly organised by the International Solid Waste Association (ISWA) and the Waste Management Association of Malaysia (WMAM) with the support of the Malaysian Ministry of Urban Wellbeing, Housing and Local Government, Ministry of Energy, Green Technology and Water, Kuala Lumpur City Hall, Ministry of Tourism and Culture Malaysia and the Malaysian Convention and Exhibition Bureau. The congress was scheduled with several meetings and side events from 22-25 October in Kuala Lumpur, Malaysia.

Heralded as the industry's premier event, the ISWA World Congress is where professionals meet to exchange ideas and opinions to advance scientific and technical knowledge for sustainable solid waste management. The three-day event attracted over 1,000 delegates from across the globe.

The ISWA World Congress 2018 featured a comprehensive scientific programme highlighting the socio-economic impacts of waste recycling, waste reduction, and health, safety and policy regulation pertaining to recycling and climate change. It also included areas of current interest such as marine and coastal waste management. The scientific programme culminated with a forum that will see key ASEAN ministers responsible for solid waste management, participate in a dialogue to re-evaluate waste management policy and practices within the region.

LEAD Nepal as a local partner of executing Waste and Climate Change Project of International Climate Initiative (IKI), contributed on the waste and gender nexus assessment and presented the present scenario of the gender in waste management of Nepal. The executive director of LEAD Nepal attended the congress and shared the Nepal's initiatives along with the highlights of LEAD Nepal work on the gender and waste management.

## **2.1.3. National, Regional and Local consultation on the Integrated Waste Management**

### **2.1.3.1. Solududhkunda Mission**



*Figure 1: View of municipality from the Patale (Ward Number 11) with mountainous range at north.*

One and half day programme on Integrated Waste Management of Solududhkunda Municipality was conducted in Faplu and Salleri, Solukhumbu in 25 and 26 December 2018. The detailed programme agenda is provided in Annex 1. Six members team from Kathmandu visited municipality. The team was led by chief of Environment and Disaster Management Section of Ministry of Federal Affairs and General Administration (MoFAGA). Other delegates included Engineer from Ministry of Urban Development, Expert of the Organic waste management, officer from MoFAGA and CEO and Programme Manager of LEAD Nepal. Different local level stakeholders participated in the different programme of day I and day II.



### Day I:

The six members team from technical committee arrived Faplu, Solukhumbu early in the morning for two days mission on Integrated Waste Management of Solududhkunda Municipality. At the early morning, Mayor of the municipality along with Chief Administrative Officer came to welcome the team from Kathmandu and had an informal talk on the overall waste management issues of the municipality. After the breakfast at the hotel, the team walked down to the hill to the Municipality office to meet municipality officials and private sectors working in the waste management. During the 20 minutes walk team took a snapshot view of the market area of the municipality.



*Figure 2: Meeting with Mayor and officials of the municipality*



*Figure 3: Discussion with waste workers at mayors office*

proceeded with the waste management situation in the past and how has been managing since they got their responsibility.

The major discussion points are:

Total of 15 participants attended the meeting at municipality including the team from Kathmandu and Mayor of the municipality. The list of participants is in annex II. The programme started with the introduction of all the participants along with their engagement on waste management in the municipality. Ms. Karuna Adhikaree and Ms. Aisha Khatoon explained about the mission and objectives of the meeting.

The most interesting part of the meeting was all were young and dedicated to the waste management from their end. The programme



- The leader of the municipality realized the loss of scenic beauty of the city from haphazard disposal of glass bottles and other dry wastes. To overcome the problem, they started cleaning campaign of the beer bottles, plastic items dumped around the houses of the city area from ward 1 to ward 11. Private company was contacted to deliver the glass bottles and other dry recyclables to the Bhairahawa for recycling purposes. Private company has hired 5 staff to collect, pack and upload the dry recyclables.

- The private company is on the loss however, they are continuing the work assuming the future income after the municipality installed the recycling technology.

- They also separated the dry recyclables items from the temporary dumping sites and landfilling the wastes.

- At the initial stage they are targeting glass bottles specially beer bottles and plastic items. From the 1 January 2019, they are planning to ban beer bottles and plastic bags from entering into the municipality. They had formal and informal talks to the business man and local people regarding this. Till date all the related stakeholders are ready to ban the beer bottles and plastic bags at this stage. As an alternative they are planning to enter can beer instead of beer bottles and clothes bags instead of plastic bags.



*Figure 4: Spring at the heart of city (Salleri, Ward#5)*



*Figure 5: Waste worker collecting waste from the road side drainage*



- Municipality has delegated 4-5 staff for the campaign along with mayor, deputy mayor and chief administrative officer for major events.
- The waste collectors were happy and satisfied with their remunerations and job responsibility. They have not yet witnessed any cut and injury and mis-behaviour from the community people.

The meeting was adjourned with group photo and remarks from Mayor for next day programme.

The team visited temporary dumpsites, storage site of dry recyclable items across the municipality and the market area of



*Figure 6: Dry recyclables waste storage site*



*Figure 7: Temporary dumpsite*

rarely see the bottles scarred in the terraces and streets of the city.

Salleri. Although the temporary dumpsite is on the bank of spring, it was managed than previous survey period during March 2018. The final non-recyclable items after thorough segregation was dumped and filled with soil. Very few scattered dry wastes can be seen in the dumpsite. The storage site was very impressive with huge amount of bottles and some plastics and cardboards. One can easily observe the change since March 2018 to the visited date. The Municipality looks more cleaner than before and we can

**Day II:**



On 26 December 2018, 52 participants participated in the workshop on Integrated Waste Management of Solududhkunda Municipality. The participants represented from Ministry of Federal Affairs and General Administration (MoFAGA), Ministry of Urban Development (MoUD), Solududhkunda municipality including mayor, local health office, agriculture and livestock office, ward offices, civil societies, Tole Improvement Committees (TIC) from almost of all the wards, journalists, two representatives from and the team from LEAD Nepal. The list of participants is in annex III. The programme was chaired by the Mayor of Solududhkunda Municipality. Ms. Karuna Adhikaree, Programme Manager of LEAD Nepal shared the background of LEAD Nepal and the process of Waste



*Figure 8: Group photo of the workshop participants*

and Climate Change Project in brief. Aisha Khatoon, CEO of LEAD Nepal shared the objectives of the programme and appeal for the fruitful discussion during the programme. Mr. Rishi Raj Acharya, Chief of Environment and Disaster Management Section of MoFAGA highlighted the role of central government in waste management and MoFAGA's leadership in executing Waste and Climate Change Project in Nepal. Likewise, Mr. Bijaya Raj Subedi, Chief Administrative Officer of the Municipality shared the initiatives of Municipality in waste management starting from the collection of beer bottles from the terraces and backyard of the houses and commercial establishments, management of temporary dumpsites, appointment of the staff to look for waste management issues of city, the appointment of the private company to work on the waste collection segregation and transportation to the Bhairahawa to the establishment of the Tole Improvement Committee with the representation of the community people. He also informed that municipality will ban the beer bottle and plastic bag from entering into the municipality from 1 January 2019 and appealed for the support and cooperation. He also shared the act on Waste Management as a major achievement in policy formulation. After that, Prof. Dr. Ananda Shova Tamrakar enlightened the participants on the organic waste management through composting. She is a pioneer of vermi-composting in Nepal. Ms Karuna Adhikaree shared the baseline survey findings of Solududhkunda Municipality. After that, floor was opened for the discussion. Finally,

Mr. Namgel Jhyangbu Sherpa, Mayor of the municipality acknowledged the contribution of LEAD Nepal in conducting baseline survey and workshop. He appreciated the contribution of the TIC in the cleanup campaign of the city without which municipality alone could not achieve the target. He further stated that municipality is dedicated to reform the cleaner and economically sustainable mountainous city. He announced the ban of beer bottle and plastic bags from 1 January 2019. The workshop was adjourned with the closing remarks from the chair.

#### **2.1.4. Birendranagar Mission (2-4 March 2019)**



*Figure 9: Ariel view of Birendranagar Municipality*

One and half day programme on Integrated Waste Management for Strategy Development of Birendranagar Municipality was conducted in Birendranagar, Surkhet in 2 and 3 March 2019. The detailed programme agenda is provided in Annex 1. Eight members team from Kathmandu visited municipality. The team was led by chief of Environment and Disaster Management Section of Ministry of Federal Affairs and General Administration (MoFAGA). Other delegates included Under Secretary from Ministry of Industry, Commerce and Supply, Engineer from Ministry of Urban Development, an Engineer from Ministry of Forest and Environment, Expert of the Organic waste management, Managing Director, Programme Manager and Assistant Officer of LEAD Nepal. Different local level stakeholders participated in the different programme of day I and day II.

##### **Day I:**

The eight members team including members of technical committee and LEAD Nepal arrived Birendranagar, Surkhet arrived in 10 am in the morning for two days mission on Integrated Waste Management for Strategy Development of Birendranagar Municipality. After the breakfast at the hotel, the team went to Municipality office to meet municipality officials and private sectors working in the waste management.



Total of 24 participants attended in two phases, first with mayor, deputy mayor, chief administrative officer and other officers and second with the private sectors and some waste handlers from municipality. The list of participants is in annex II. The programme started with the introduction of all the participants along with their engagement on waste management in the municipality. Mr. Rishi Raj Acharya and Ms. Karuna Adhikaree explained about the mission and objectives of the meeting.

The chief administrative officer and his colleagues shared about the overall waste management modality of the municipality. The Mayor requested the team to provide them strategy and action plan not later than Mid-June 2019 in order to integrate plan and program in the next fiscal year.



*Figure 10: Meeting with Mayor, Deputy Mayor and Officers of Birendranagar Municipality*

The major discussion points are:

- The leader of the municipality realized the loss of scenic beauty of the city from haphazard disposal of litters. Municipality along with two private companies are currently collecting waste from households, market areas and other institutions and disposing them directly to the dumpsite.
- A recent study from Alternative Energy Promotion Centre revealed that approximately 60-70% of the total wastes from the municipality is being collected and dumped.
- Compost plant has recently been established by a private-public partnership.
- Private company owned a sunction machine for faecal sludge management.
- Municipality has recently completed the process of Initial Environmental Examination Study of the proposed landfill site and government has also approved it. Now, Municipality is preparing Detailed Project Report (DPR) of landfill site. Some institutions have already shown interest to support in constructing an engineered landfill site.
- Municipality has also put resources in managing hospital waste.
- Municipality is willing to accept the technical support of LEAD Nepal in strategy and action plan development the Birendranagar City. They requested LEAD Nepal to provide not later than mid-June in order to integrate in their annual plan and programme.
- Tole Development Organization is the community organization which is being formed in each ward and given the role of mediator between the waste collector and the community people.
- Private sectors pointed out the challenges of a) lack of awareness on waste segregation b) open drainage system c) unclear policy of segregation and recycling at national and local level and c) few recycling activities within municipality

The meeting was adjourned with acknowledging their participation.

The team visited current dumpsites which was located at middle of the jungle and approximately 10 km far from the city. The dumpsite was unmanaged and one can easily observe mixed waste



*Figure 11: Dumping and open burning of waste at dumpsite*

from hospitals and date expired food wastes and burning of waste here and there. The team then travelled down to the composting plant where the Green City Sewa Pvt. Ltd has recently installed the plant. The capacity of the compost plant is 5.4 tons. They have started with collecting organic wastes from vegetable market and able to make compost from one compartment (1200





Figure 12: Composting plant of Birendranagar Municipality


then moved to visit the park and famous Bulbul lake. The municipality has placed dustbin in each corner of park with color code (green and red) without labelling. The famous lake is in the deteriorating condition with algal bloom at every corner which is seeking attention of the local government to clean and conserve for future generation.

## Day II:



Figure 13: Group photo of workshop participants

On 3 March 2019, 49 participants participated in the workshop on Integrated Waste Management for Strategy Development of Birendranagar Municipality. The participants represented from Ministry of Federal Affairs and General Administration (MoFAGA), Ministry of Urban Development



(MoUD), Ministry of Industry, Commerce and Supply, Ministry of Forest and Environment, Academician from Tribhuvan university, representatives from ministries of provincial government, officials from Birendranagar municipality including mayor, ward offices, civil societies, Tole Development Committees (TDC) from almost of all the wards, journalists and the team from LEAD Nepal. The Chief Secretary of the Karnali Province also accepted invitation and attended the programme till the end. The list of participants is in annex III. The programme was chaired by the Mayor of Birendranagar Municipality. Mr. Ram Prasad Thapaliya, Chief Secretary of Karnali Province honored the chief guest. Mr. Prakash Paudel, Senior officer of the Municipality and Ms. Karuna Adhikaree, Programme Manager of LEAD Nepal facilitated the programme.


Programme started with the welcome remarks from Rishi Raj Acharya, chief of environment and disaster management section, MoFAGA. He stated that amount of waste has been increasing with the urbanization of the city in Nepal. The city dwellers have to learn to convert the waste into resources in order to manage it in a sustainable way. The next important thing to put into priority is segregation in source. He shared examples from the world how local government can work effectively with given rights from the constitution. He then emphasized the polluters pay clause stated in the Solid Waste Management Act. He committed to provide any support and help from central government in the waste management for the Birendranagar Municipality and encourage the local leader to work effectively and achieve their goal to make clean and green city within their tenure.

Karuna Adhikaree shared the objective of the programme to a) share findings of the baseline survey 2018 of Birendranagar Municipality b) share the initiatives that has been done by LEAD Nepal b) shared the environment standard of Nepal in pollution (air, water and land) d) collect feedbacks and suggestions as much as possible to develop a city strategy and a district strategy in integrated waste management and c) share waste management database template and collect feedbacks.

Mr. Krishna Bahadur Khadka shared the initiatives of waste management in Birendranagar Municipality. He shared findings of recent study conducted by the Alternative Energy Promotion Centre (AEPIC) to study feasibility of community bio-gas in the Birendranagar Municipality. He shared the composition of waste in household, institution and commercial establishment. He then highlighted the challenges of open drainage, inappropriate awareness among the city dwellers, less number of private companies working on the waste management, inefficient hospital waste management, mixing of hospital waste to other municipal waste to the dumpsite. He also stated that municipality is trying to improve the management system devolving the authority to the wards and increase the involvement of the TDO and private company.

Ms. Aisha Khatoon, Managing Director of LEAD Nepal presented the major findings of baseline survey 2018 along with initiatives that has been implemented by the LEAD Nepal. She shared the survey methodology and approach, waste generation per capita of household, institutions, commercial establishment and municipality. She then highlighted the major challenges faced on managing waste and opportunities to improve the management for better result.

Mr. Tulsi Narayan Maharjan presented the status of environment standard that have been developed implemented by the Ministry Forest and Environment. Major standards were in air pollution followed by water pollution and waste (banning of plastic bags b



elow 30 microns in Nepal and below 40 microns in Kathmandu Valley). He informed that Nepal has banned the import of plastic scrap and recycled granules. He also stated the prohibition of open burning of industrial waste provisioned by Industrial Business Act 2017. He then highlighted the Basel, Stockholm and Minamata Conventions. Nepal is now moving towards managing mercury waste management by minimizing the use of goods with mercury in it like tubelight, CFL bulb, thermometer etc and stop producing mercury.

Ms Karuna Adhikaree highlighted the major findings of the baseline survey 2018 of Birendranagar Municipality. The findings of baseline survey were somewhat similar to the

AEPC feasibility study. The organic waste constitutes the highest proportionate in household, institution and commercial establishment in both of the study. She then highlighted the waste management problems as open dumping, open burning at city area as well as at dumpsite, scattered and uncollected waste around the city, mix waste dumped in the dumpsite etc. She shared some approaches to convert challenges into opportunities by recovering resources.

Ms. Ananda Shova Tamrakar presented the basic principles of waste management with major highlight in segregation and vermi-composting. She explained how can we segregate the waste at source with simple taking two plastic bags and put wet and dry waste separately. She then demonstrated the process of vermi-composting to manage decomposable waste including papers, clothes, hairs, garden wastes etc.

Mr. Gyanendra Parajuli requested the local government and provincial government to think environment first before giving authority to open new industry. The forum was open for the discussions. After the discussion, the guest, chief guest and chair delivered their remarks.

The Renu Acharya, Deputy Mayor of Bheriganga Municipality delivered her remarks. On her remarks she stated that we are presuming our city to convert into zero waste but in practice we are throwing waste everywhere and losing our city's beauty. Bheriganga is trying to adopt the best practices of other municipalities. She appealed LEAD Nepal to develop a strategy of her municipality as well.

Mr Ram Prasad Thapaliya delivered his remarks as a chief guest. He emphasized the importance of team work. He stated that waste management is becoming an issue in Birendranagar as well unlike before because of high migration from hills and mountain. He appreciates the work of municipality in waste management and other environmental issues. He requested municipality to allocate resources in awareness programs which ultimately help to change the behavior and to conserve ponds, lakes and maintain open spaces within the city. He acknowledged for selecting Birendranagar for pilot study to LEAD Nepal and MOFAGA and requested to make this city a centre hub for capacity building of the Karnali Province.

Mr. Dev Subedi acknowledged LEAD Nepal and MoFAGA organizing consultation workshop and highlighted the waste management issue in Birendranagar Municipality. He requested MoFAGA and LEAD Nepal to provide integrated waste management strategy not later than mid-June and he could integrate in the annual plan and programmes for next fiscal year. He designated Mr. Prakash Paudel, a focal person for waste management and requested him to liaison with LEAD and MoFAGA. He adjourned the programme.

The major discussion points are listed below:

- Appreciated the work done so far by the municipality with the leadership of local leaders.



- The participants were mostly interested to understand and learn more about the environmental standards of brick industry, mercury and industrial effluent. Mr. Maharjan elaborated the height of chimney of brick industry. He also reiterated not to use the CFL bulb and tubelight with mercury to avoid the mercury waste.
- City dwellers were worried about the city being deteriorated by scattered waste and pulled their attention to manage it in a sustainable way.
- Appreciated the segregated waste collection of the municipality.



*Figure 14: Open discussion during the workshop*

After lunch team from Kathmandu sat together with municipality officials and ward officials and tested the data collection templates and questionnaires. They provide the following feedbacks on data collection templates.

- They requested LEAD Nepal to simplify the template for regular keep record in regular basis.
- They assured the team to conduct detail survey once a year by involving university students and keep record of detail composition from each tiers i.e. household, institutions and commercial establishments.

### **2.1.5. Surkhet Mission (26 March – 1 April 2019)**

LEAD Nepal along with Solid and Liquid Resources Management (SLRM) Model developer, practitioner and trainer visited four municipality of Surkhet to observe the waste management status of Surkhet vally and Bheri Valley. The visited municipalities are: (1) Birendranagar Municipality; (2) Bheriganga Municipality; (3) Gurbhakot Municipality; and (4) Lekbeshi Municipality


**Objectives:** To understand the ground situation of solid and liquid waste management in four municipalities in Surkhet district to assess the feasibility to design and pilot a Solid Liquid Resource Management (SLRM) project in the selected municipality.

#### **2.1.5.1. Birendranagar Municipality**

##### **Waste Generation, Collection, Transportation, and Disposal**

Birendranagar Municipality has provision of daily door-to-door waste collection. However, Ward No. 12, 13, 14 do not have any collection mechanism. A private contractor (The Green City) is contracted for waste collection from commercial/market areas in ward No. 3, 5, and 6). In rest of the municipalities, municipal waste collection crew collects the waste in a Tripper. Private sector collects waste in tractors. The collection occurs in the morning from 7-9 hrs. Collection vehicle blows siren and residents bring their waste and puts in those collection vehicles. Some also leave their garbage on the street and the collection crew loads it on the vehicle. There is no practice of waste segregation into biodegradables and nonbiodegradables.





Mixed MSW with medical waste from hospitals and pharmacy is a common sight. City drains are clogged with garbage, especially, plastic bottles.

The mission team visited Ward No. 13 & 14 Ratanagla area- border to Dailekh district, which is a beautiful landscape with Rhododendron forest. Rhododendron is a national flower. Despite few notice board saying “waste disposal prohibited site”, this pristine landscape has waste dumped along the roadside. Some small eateries/hotel collect recyclable items (glass bottles and metal cans) while rest are dumped on the road and burnt.

#### Ratanangla area

There is no transfer station in the municipality. Waste collected is directly transported to the landfill site located in Tarebhir, Ward No. 1, about 15 Km from the downtown. The landfill site, in reality, is an open dumping site without any engineered structure to collect leachate or methane gas, or any soil covering. The access to road to the dumping site is poor, as it is a graveled (mud) road, which often gets inaccessible due to flood in Gangate Khola/river during monsoon season. Even though the Tarebhir Dumping site was allocated 10 years ago, garbage is being dumped there only since Sep-Oct 2017. Before this, the municipality used to dump garbage in Bheri Community Forest near Dhuliyabeat for years. Currently, 2 trippers and 8 tractor load of waste is dumped in Tarebhir. Two staffs (local women) have been recruited by the municipality to oversee the dumping site management. The ladies scatter and level-off the garbage and spray insecticide in the waste dump. We observed that these staffs were working in the dumping site without any protective gears such as gloves, mask, and boots.

During the visit, it was observed the burning of waste heaps. Perpetual smoke was rising from the dumping site. Similarly, we observed bags of medical waste dumped with MSW.

During the monsoon season, the r as the Tarebhir dumping site is inaccessible, municipality dumps garbage in an alternative site at Bheri Bahireni. This site is along the Surkhet-Nepalgunj highway. The mission team observed similar situation in Bheri Bahireni too, i.e., mixed waste, medical waste, construction and demolition waste etc., and perpetual smoke in the waste heaps. We also observed a couple of such dumpsite across the highway.

#### **Waste Recycling**

Waste recycling is attributed by private sector, i.e., local scrap dealer. There are around 8-10 medium-scale scrap dealers operating the municipality. Such dealers buy recyclable items – general paper, cardboard, glass bottles, plastic bottles, aluminum cans, tin, iron etc. from individual itinerant buyers. Once a truck load of such materials is collected, the dealers sell to a larger dealer who then sell to factories in Nepalgunj, Butwal, and Narayangarh.

The mission team visited a local scrap dealer Mr. Chandan Jaiswal’s shop. According to him, he buys scrap items not only from Birendranagar municipality but also from neighbouring districts Jumla, kalikot. Mr. Jaiswal is into scrap business for years, and the current shop is eight months old. He runs the scrap collection centre in a rented land. He is satisfied with the scrap dealing business. In his business, Mr. Jaiswal reported that he has not seen female itinerant workers in Birendranagar. He shared that buying prices of recyclable items as below: PET bottles (Rs. 5/kg); Plastic items-bucket, chairs etc. (Rs. 12/kg); Saline water bottles (Rs. 12/kg), Aluminum beer cans (Rs. 60/kg), general paper (Rs. 12/kg), cardboard (Rs. 5/kg), beer glass bottles (Rs 2/kg), iron rods (Rs. 20-25/kg), tin items (Rs 15/kg), broken glass pieces (Rs 3/kg). He does not deal in n E waste items

#### **Bulk Waste Generation from Hospital, Market, Slaughter House, School, City Park, and Small Cottage Industry**

### **Karnali Province Hospital:**

Karnali Province hospital. This is a tertiary referral hospital, which has a current capacity of 50 beds (but is operating 115 beds) is expanding to 300 beds soon (from Shrawan 2076). The hospital has a total area of 25 Bigha (6.32 hectares). Currently, hospital wards are equipped with 4 colored bins for segregation of waste, however, segregation is not done properly. There are bins (made of concrete rings) in hospital premises for garbage collection from visitors. There is one cage bin for plastic bottle collection, which is given to scrap dealers. In terms of medical waste, the hospital has a placenta pit and an incineration chamber, which is currently not in operation. There used to be a biogas plant for toilet waste and placenta, but, is currently not in operation, due to some maintenance issue. Diapers, napkins and blood-wet cotton are stored in a separate room, which was initially intended for vermicomposting. Syringes and needles are destroyed using needle breakers. Overall, the management of infectious and hazardous medical waste is not managed properly. Other regular waste generated from hospital areas are collected (which are often mixed with infectious medical waste) are dumped and burnt at the backside of the hospital premises. The hospital is in talks with a private company for establishing a system for hospital waste management. An autoclave machine is already purchased. There is a scope for proper management of regular waste generated from the hospital if separated from infectious waste. In general, 80 percent of waste from hospital are of regular nature like municipal waste, while remaining 20% are infectious and hazardous nature, which needs separate management plan.

### **Integrated Fruits & Vegetable Market Complex (Bulbule Chetriya Upaj Bazara Kendra):**


Birendranagar Municipality operates a fruit and vegetable market, which was constructed with fund and technical support from SNV and IFAD to the Ministry of Agriculture, Government of Nepal. There are currently around 32-35 fruit and vegetable wholesale shops operating in the complex. These shops pay rent to the Ward Office through the Vegetable Market Operation & Management Committee. The market generates around 1 ton of biodegradable waste during monsoon season, and 0.3 to 0.5 tons in other seasons. Most of these wastes are the damaged fruits and vegetables. Rest are plastic and wood crates, cardboards, and plastic bottles. Drains in the market are clogged with garbage; the surrounding areas are also unclean. The market complex is constructing a common Cold Storage, while few individual shops have their own cold storages to keep fruits and vegetables fresh for longer time. The committee pays Rs. 9,000 per month to the municipality contracted waste collector directly, which used to collect the waste daily. However, after the waste collection fee is now being paid to the Ward Office, waste collection has been irregular. Speaking to the shop owners, they showed an interest in managing their biodegradable waste through composting.

### **Goat Slaughter House:**

Birendranagar municipality operates a Goat Slaughter House, with two staffs hired for managing the facility. Around 15 goats are slaughtered in this facility early in the morning between 4-6 am. Local meat vendors pay Rs. 165 per goat. All meat items, blood, and stomach/entrails are sold, the only waste produced is hair and goat dropping/dung, and the wastewater after cleaning the slaughter house floor. These waste products are collected by the municipality. Goat dropping/dung is piled on the ground and covered with tin to avoid smell and insects. A biogas plant which was supposed to utilize the dung is now left abandoned/not in operation.

### **Buffalo Slaughter House:**

There is another slaughter house in the city, operated and managed by a local agricultural group. Around 3-4 buffaloes are slaughtered from 3-6 am every day. The slaughterhouse has separate rooms for segregated collection of skin and bones. Skin and bones are exported to India for recycling. Dung is managed through a Biogas facility, which is now non-functional, waiting for maintenance. The biogas plant when in operation used to supply biogas to neighbouring 10-15 houses, upon paying Rs. 500/month as



fee. Other general waste items such as bottles, papers and others are openly burnt inside the slaughterhouse premises.

**Birendranagar Army Residential School:**

The school is inside the Army barrack, which has 650 students. Most of which are residential students. With students, teachers, army families around 1,000 people resides inside the campus. A canteen is operated inside the compound, which is a major source of food waste. Food waste are given to local piggeries as animal feed. As per the circular from the Army Headquarter, the campus area has prohibited the plastic bag into the campus since last 2 weeks. Rest are buried and burnt in the army campus in a pit. The school administration is interested in exploring options for better management of waste.

**Bubbule Lake/City park:**

Bulbule lake is a famous tourist destination of Surkhet district. Many visitors come to the park area for recreational purposes, for rafting, picnic and for strolling. Dustbins are placed across the park, and Birendranagar Municipality collects the collected waste. However, it was not managed.

Along with these places team visited abandoned cattle and cow shelter, rani ghat cow shelter, bakery factory and shop, open storage area of the private sector etc. the management of waste was observed and documented.

**2.1.5.2. Bheriganga Municipality**

**Waste Generation, Collection, Transportation, and Disposal**

Waste is collected from households and street (from market areas) twice a week by Bheriganga Municipality. Chhinchu bazar is the downtown area of the Municipality. Other two market areas are Jahare and Ramghat. Waste collection crew. No private sector has yet been contracted for waste management in the municipality. Dustbins are placed across the streets in main commercial/market area. It was observed that people do not place the organics and inorganics in separate bin, as well as there are waste on the streets and city drains.


Bheriganga municipality has two dumping sites. One dumping site is located in Ward No. 12, which is near the municipality office. This dumping site dumps waste generated from Chhinchu market area. This site also has no proper management system, garbage is dumped and burnt. Few scavengers were seen collecting tin items.

Another dumping site is located at Chhiple, which dumps garbage collected from two other market areas, namely, Jahare and Ramghat. Both are open dumping ground where open burning of garbage is a common sight. During the field visit it was also shared that another dumping site was operating in community forest area for the garbage collected from Ward no. 11 and 1, which was shut down recently after the complaints of foul smell and water pollution from local residents.

**Recycling- Local Scavenger in Chhinchu Bazar**

A medium-scale scrap collection centre run by Mr. Umesh Jaiswal was visited. He claimed that this is the only one scrap business operating in entire Bheriganga area. He also buys recyclables from individual itinerant buyers, then sells to big dealer who then sells factory in Butwal, Narangarh. He deals with all kinds of recyclables- glass bottles, plastic household HDPE items, iron, tin, paper, cardboard etc. On an average, he sells 0.1 to 0.12 tons of recyclable items in a month. He says that scrap is a profitable business. It was observed that he also collects tin cones that are used to collect pine gum.

**Sharada High School**



Located in Chhinchu bazar, Sharada High School is a Government School with 116 students and 25 teaching and administrative staffs. In terms of solid waste, School Canteen that provides afternoon meal for students from Grade 1-5 generates is the main source of waste from the school. Other wastes are paper and cardboards. The school administration sells 0.2 to 0.25 tons of paper to local scrapshop. School Premises is equipped with drum container as dustbins. Majority of the waste generated from the school is burned in the school premise. The school faces water logging during monsoon.

#### **Ramghat Health Post**

Located in Ward No. 11 of Bheriganga Municipality currently caters 25-30 Out Patients in a day, 15 delivery a month, and 25-30 per month Antenatal checkup patients. The Health Post operates in a new building since last year. The health Post is well maintained and clean. The Health Post plans to expand as a 15-bed hospital in near future. Waste generated from the Health Post is segregated and dumped in two pits; one for biodegradables and another for inorganics including unused medicine. At the time of our visit, no hazardous syringes and blood and stool-soaked wastes were seen in the pit. There is a concrete pit for placenta disposal. It was shared with the mission team that the area suffers from water scarcity.

#### **Liquid Waste Management in Bheriganga Municipality**

Bheriganga Municipality has a poor state of city's drainage situation, as shared by the Ward Representative. The Chhinchu bazar is a low-lying area and inundation is often a problem in rainy season. There is no wastewater treatment plant in the municipality, and drain water is directly discharged to Chhinchu khola and others that ultimately reaches to Bheri river. The city drains are often clogged with garbage. Bheri river is an important water source for residents as the household pump river water for drinking and other purposes. Direct discharge of wastewater in the river hence increases the chances of water contamination.

#### **2.1.5.3. Gurbhakot Municipality**

##### **Waste Generation, Collection, Transportation, and Disposal**

Gurbhakot municipality generates waste mainly from 3 major settlements, namely, Mehulkuna (ward no. 8), Botechaur (ward no. 9), and Gumi (Ward no. 13). Waste is collected once in every 2 days a week from these bazar areas. A team of 3 cleaning staffs and 1 driver constitutes the municipal waste collection crew, who collect waste from roadside dustbins and loads in 1 tripper (of 5 cubic meter capacity).

On an average 7 cubic meter (1.5 tripper load) of waste is collected and dumped once in a 2 day. Such collected waste is currently dumped in a temporary dumping site at Manike Raniban forest area located in Ward No. 8 (from last 4 months). Waste is dumped in a creek, situated in a Forest area. The dumped waste is burnt. Before this site, waste used to be dumped at Dhulkhare area, which had to be halted due to complaints from the local community. An Initial Environmental Examination (IEE) is under approval process for a new landfill site at Patihalna forest area.

##### **Waste from Mehalkuna Hospital**

Mehalkuna hospital provide services to patients from not only Gurbhakot municipality but also from nearby districts Salyan, Rukum, before they go to Birendranagar provincial hospital. The hospital management is constructing a new building to expand to 50 bed hospital. There are plastic containers used as bins to collect general waste. The drum's lid is half cut-open and waste is collected easily without having to lift or touch the bin. Waste from these bins are collected by the municipality, while infectious and hazardous medical wastes are collected separately in color coated bins. However, those infectious waste are buried in pits inside the hospital premises and burned. Placentas are buried in a concrete pit. Glass vials, and other infectious and hazardous waste is burnt in an open pit. An old incinerator is now dismantled as a new building is under construction in that area. Some best practices adopted in the hospital is the segregation of PET bottles, which is given/sold to scrap collectors. Despite these

arrangements, the mission team observed that waste segregation is not practiced rigorously, and medical waste needs better management.

#### **Waste Recycling- Scrap Business**

Gurbhakot municipality charges Rs 30-35,000 from a local scrap dealer Mr. Man Bahadur BK for collecting recyclable items from Gurbhakot municipality area. He deals in recyclable items-paper, cardboard, tin, iron, glass bottle, plastic scraps etc. A team of 5 people are hired as a salaried staff by the proprietor for scrap collection activities. The collection centre is located on the proprietor's own land. Glass bottles are sold to factories in Narayangarh and others in Nepalgunj. On an average 2 truck load of glass bottles are sold a month, while plastic and iron are sent once in 2 months.

#### **Water and Wastewater Management**

Gurbhakot municipality has no drainage/sewer network, and wastewater directly flows to Bheri river. Municipality's drinking water source (muhaan) is in Malarani, Mehelkuna. The Municipality has received a budget of Rs. 72 crores for the execution of Small urban drinking water project- Sana Sahari Khanepani Yojana. Under this project, water from Bheri is pumped to distribute in the city.

#### **2.1.5.4. Lekbeshi Municipality**

##### **Waste Management Situation in Lekbeshi Municipality**

Lekbeshi municipality is a newly announced municipality. Settlement is rural in nature as compared to other municipalities in Surkhet district. The Municipality does not have waste collection system as yet. A few tin/drum dustbins are placed in market area. People manage their waste at their premise, i.e., collect and burn waste. The Municipality has secured a land in Tadi, Dashrathpur community forest area (in Ward No. 7) as a potential Dumping Site for future.

##### **Our Observation & Conclusions**

The field team observed that in all four municipalities, MSW management is in primitive state. Some of the observations made are:

- Mixed waste collection is a common practice, i.e., segregation practice is almost nil
- MSW is often mixed with infectious and hazardous medical waste
- Open dumping of waste along the road side and dumping site is rampant
- Open burning is practiced daily twice a day one early in the morning (homes and farms) one at night (mostly commercial areas).
- City open drainage is another challenge, wherein, wastewater directly drains to nearby rivers polluting the water resources
- In the bakery LDPE plastic film is used to pack the products, and thermocol is used as the base for cakes.

#### **2.1.6. National Workshop on Mainstream Gender into Waste Management of Nepal**

A half day consultation workshop on Mainstreaming Gender into Waste Management was jointly organized by the Ministry of Federal Affairs and General Administration (MoFAGA), Government of Nepal, UN Environment International Environmental Technology Centre (UNEP IETC) and Leadership for Environment and Development (LEAD) Nepal on 22 April 2019. 27 Participants from the ministries, municipalities and I/NGOs, academia working in the waste management attended the workshop. Agenda of the programme and list of participants is in Annex I and Annex II respectively.





*Figure 15: Group photo of the participants after opening session*

The main objective of this consultation workshop was to present, share and discuss the Gender and Waste Nexus: Experiences from Bhutan, Mongolia and Nepal' report findings from Nepal and collect suggestions and feedback from the stakeholder. The Specific objectives were to:


- Share some basic information of Gender linking to the waste management
- Share the findings of the report specifically from the Nepal
- Collect suggestions, comments and feedbacks of the stakeholders to upscale the report.
- Collect recommendations on Gender mainstreaming into the National Strategy and Action Plan on Integrated Waste Management.

### **Opening Session**

During the opening session of the workshop, five distinguished guests welcomed the participants by sharing the objectives of the workshop and requested for an active participation in the programme. The opening session was chaired by Mr. Rishi Raj Acharya, Chief of Environment and Disaster Management Section, MoFAGA. Mr. Pushpa Lal Shahi honored a chief guest.

**Ms. Aisha Khatoon**, CEO, LEAD Nepal welcomed participants. She shared brief about the Waste and Climate Change Project. Additionally, Ms Khatoon highlighted the objectives and outcomes of the programme. She also presented a summary finding of the baseline assessment on Integrated Waste Management of 2018 and gender components of draft national strategy on integrated waste management document.

**Mr. Pushpa Lal Shahi**, Joint Secretary, Ministry of Industry, Commerce and Supply acknowledged the MoFAGA and LEAD Nepal for organizing consultation workshop very timely and in an important issue which has been neglected or overlooked by the nation till now. Mr. Shahi highlighted some of the gendered aspects of industrial waste management which he had witnessed during his visit to the industries. He stated that until and unless we create a blue color job for the waste workers this kind of



social stigma will always remain the same so that he requested to the government and non-government partners to introduce the environment sound technology from which we can save environment and reduce the human work at very source of management. He also requested the authentic organization to introduce health safety and health insurance to the waste workers.

**Ms. Junko Fujioka, UNEP IETC**, Gender Focal Point of UNEP IETC delivered opening remarks. Ms. Fujioka welcomed all the participants on behalf of UNEP IETC and requested to actively participate in the programme. She stated that waste management is the global phenomena which affect locally in which gender roles and responsibilities have been neglecting till now and considering as a gender neutral. In fact, men and women are affected differently according to their roles and responsibilities. She also highlighted the objectives of the Nepal mission and informed about the later presentation on Gender and Waste Nexus Report prepared by GRID Arendal.

**Rishi Raj Acharya**, started his talk with the introduction of the event and MoFAGA's coordination with LEAD Nepal for the conduction of waste management project all over Nepal mainly focusing in two places for Integrated Waste Management; Surkhet and Solududhkunda. Based on his field and policy level experience for about two decades, he found that household plays an important role in managing the main bulk of waste which has been creating the main problem to the municipalities. Additionally, community level management centres would play vital role in utilizing reusable and recyclable wastes. He further emphasized the role of women in waste management at household and community level. Health problems and safety are the issues which has to be identified and addressed so that government and private sector can manage in a sustainable way. He also requested all the participants to actively participate and provide constructive feedbacks and inputs to the report and the group work. He then ended up the opening session and requested all the participants to actively participate in the workshop.

### Technical Session

In this session Ms. Fujioka presented a key finding of the report entitled "Gender and Waste Nexus Assessment: the case studies from Bhutan, Mongolia and Nepal". The session was moderated by Mr. Rishi Raj Acharya.

**Ms. Junko Fujioka, UNEP**, presented her presentation with the introduction of gender and role of male and female in the society and prevailing gender inequality in the society. She highlighted that rights, responsibilities, and opportunities will not depend on whether we are born male or female. She added about the gender mainstreaming in waste management and said that gender is socially constructed.

Furthermore, she presented on the topic "Gender and Management" and stated that men and women have different needs and preferences for waste management services. She reported that women are mostly involved in uncompensated community activities, are engaged to lower paying tasks as compared to men and they are not allowed to enjoy same opportunities as men. She highlighted the key findings based on the survey of LEAD Nepal and mini survey of GRID Arendal in 2018. She presented the findings in three categories i.e. 1) household level 2) operator level and 3) management level.

In all the categories there are a huge gap across all the sectors. Women were responsible for household management activities and community initiatives and men were at policy and decision-making level. She also added that initiatives need to be carried out to encourage social entrepreneurship for both male and female and involvement of local communities in making Solid Waste Management plans. She concluded her presentation by stating that there is a need for gender mainstreaming in waste management.

The floor was opened for the discussion. The major discussion points are summarized and documented.



*Figure 16: Open discussion after the presentations*

### **World Café Exercise**

The World Café was introduced in the workshop with the purpose to facilitate engaged and thoughtful conversations among all participants, and to solicit inputs from all participants with regards to key questions under five topics, related to Mainstreaming Gender into Waste Management.

Ms. Junko Fujioka from UNEP IETC, Ms. Aisha Khatoon, Ms. Karuna Adhikaree and Ms. Sakina Khatoon facilitated all the group exercise. One reporter was assigned for each group. At first, Ms. Karuna Adhikaree briefed a general guideline, the way they interact throughout the café and expected outcome. The café discussion was focused on the five major questions. The lead facilitators divided the participants into five based on their interest. For an ease of the participants the facilitators allocated the questions for each table. Based on the questions and guidance provided the representatives from various organization put their effort on answering questions. After an hour rigorous discussion and work, each of the team came up with very good outputs which are listed below.



*Figure 17: Snapshot of the group exercise*

The group discussion was conducted and documented a constructive feedbacks and suggestions on following topics:

- Topic 1: Gender Roles & Responsibilities- Division of labour in waste management;
- Topic 2: Gender Mainstreaming into Sectorial Waste Management Planning;
- Topic 3: Feed back/Data Gaps/Recommendation for the Gender and Waste Report
- Topic 4: Mainstreaming Gender into Waste Management Strategy and Action Plan
- Topic 5: Protection/Health Safety Measures.

### **Closing Session:**



The half day long workshop was ended up with the closing remarks from Ms. Junko Fujioka, Ms. Aisha Khatoon and Mr. Rishi Raj Acharya.

### ***2.1.7. National Workshop on Waste Management and Occupational Health Hazard***



*Figure 18: Group Photo of the workshop participants*

A day long consultation workshop on Waste Management and Occupational Health Hazard was jointly organized by the Ministry of Federal Affairs and General Administration (MoFAGA), Government of Nepal, UN Environment International Environmental Technology Centre (UNEP IETC) and Leadership for Environment and Development (LEAD) Nepal on 23 April 2019. 78 Participants from the ministries, municipalities and I/NGOs, academia working in the waste management attended the workshop. Programme agenda and list of participants is attached in annex I and II respectively.

The main objective of this workshop was to deliver knowledge on associated risk for waste workers and possible options to prevent from the risk. The specific objectives were to:

- Share the findings of the research on health safety and occupational health hazard of the waste workers.
- Share the knowledge on vermi-composting and demonstrate the practical exercise on vermi-composting.
- Engage the group on identifying the list of risk associated with each strata of the management.

#### **Opening Session**

During the opening session of the workshop, three distinguished guests welcomed the participants and share about the objectives of the workshop. The session was chaired by Mr. Rishi Raj Acharya, Chief of Environment and Disaster Management Section of MoFAGA.

**Ms. Aisha Khatoon**, CEO, LEAD Nepal welcomed all the participants and requested to actively participate in the discussion and practical demonstration session. She shared about how LEAD Nepal and UNEP IETC come up with this issue and decided to conduct a day long workshop on health safety and waste management.

**Ms. Junko Fujioka**, Gender Focal Point, UNEP IETC, also welcomed the participants and informed that she was overwhelmed to see the participants and their bright faces to learn something and get back to their

work and daily life. Ms. Fujioka added the voices of women stories that were taken among the same group that were presented in the workshop. She highlighted that health safety issues were prominent among all the women who were interviewed last time. She also raised the untouched part i.e. gender mainstreaming of the waste management and informed that men and women are affected differently and treated differently in the society.

**Rishi Raj Acharya**, Chief of Environment and Disaster Management Section, MoFAGA, shared the current baseline assessment and informed that 42 surveyors are collecting the data on integrated waste management across the seven provinces of Nepal. Based on that study we would be able to find out the sustainable solution to manage the generated waste. I have been informed that many waste workers mainly women went through the cut, pain and infection during their work of segregation, collection and transportation. We, as a policy maker, are very serious about this and would think on incorporating sustainable prevention measure into the policies.

After the opening session group went to take a photo session and had a tea break.

### Technical Session 1:

The workshop proceeded with the technical session where Dr. Sujan Babu Marhatta and Dr. Ananda Shova Tamrakar presented their presentations.

At the beginning, Dr. Sujan Babu Marhatta, Prof. Manmohan Health Institute shared his findings from their study on Occupational Health Hazard and Safety practices among the Municipal Waste Handler. Basically, their study only focused on the waste handler of the Kathmandu Metropolitan City, the largest municipality of the nation. They did not include the private sector waste handler. The study aims to assess the knowledge of occupation health hazard and safety practice among waste handler in Kathmandu valley. Specifically, the study tried to assess the knowledge on occupation health hazard and safety practices and use of personal protective equipment during their work; find out the relation between knowledge of occupation health hazard and PPE utilization and; assess the work-related health problems and injuries among the waste handler and various factors associated with it. Among the interviewees almost half of the respondents were aware about the occupational health hazard however two third of the respondents did not have knowledge on how to prevent from those health hazards. Almost all of the respondents were habitual of visiting hospitals whenever they get sick. They rarely took vaccines to prevent from the possible hazards.



*Figure 19: Open discussion*

Personnel hygiene and sanitation part is very low among the waste handlers.

The session was moderated by Mr. Rishi Raj Acharya and Ms. Aisha Khatoon. The floor was opened for the open discussion. The major discussion points are summarized and documented.

Prof. Ananda Shova Tamrakar presented on the basics of the segregation methods and managing degradable waste through vermi -composting. In her presentation she included:

- Basic of the segregation of the household wastes



- Reuse, recycle and reduce principle
- Procedure of the vermi-composting
- Importance of the vermi-composting

The floor was open for the discussion. The major discussion points were documented for improvements.

#### Technical Session 2:

Immediately after the lunch the group of participants engaged on the practical demonstration on



*Figure 20: Overview of the hands-on exercise of vermi-composting*

vermi-composting for household degradable wastes. The session was facilitated by Prof. Ananda Shova Tamrakar and Ms. Aisha Khatoon. The total participants were asked to divide into the three groups. Three bamboo baskets were put at the top of the table separately. In each group one volunteer was assigned. Prof. Tamrakar and Ms. Khatoon explained and demonstrated the process of vermi-

composting with the waste generated by Hotel Summit. The wastes include kitchen waste and garden wastes. The safety measures like gloves and masks were distributors to the facilitators and volunteers. The participants were fully engaged and enjoyed the demonstration and hopefully they took the knowledge back to their home and contribute to divert the wastes that reaches the dumpsites. Mr. Laxmi Prasad Ghimire also shared his poem and song in vermi-composting which help to more energize the participants in the programme.

#### Technical Session 3 (Group Exercise):



*Figure 21: Snapshot of the group exercise*

The group exercise was done to engage and get thoughtful conversation among all the participants to the key question. Ms. Junko Fujioka, Ms. Aisha Khatoon, Ms. Karuna Adhikaree and Ms. Sakina Khatoon facilitated the group exercise. The guiding questions are listed in the annex III. Facilitator asked to divide the group based on their role in waste management like waste collector, segregator, driver, management etc. Ms. Adhikaree briefed about the key questions and what they had to write in each column. For ease of the participants

the facilitators allocated the questions for each table. Based on the guidance provided the representatives from various community organization, private companies, civil societies, federal and local government put their rigorous effort on answering the questions. After an hour discussion and work, each team came up with very good outputs which were documented.

#### **Closing Session:**

After a day long involvement of the broader stakeholders, the programme was adjourned by the closing remarks of Ms. Junko Fujioka, UNEP IETC, Ms. Aisha Khatoon, LEAD Nepal and Mr. Rishi Raj Acharya, MoFAGA.

Ms Junko Fujioka thanked all the participants for their active participation throughout the programme and specially during the practical demonstration of vermi-composting. She stated that the presentation delivered during the workshop and practical exercise and group work would be helpful and could apply to the daily life and work.

Ms. Aisha Khatoon thanked all the participants and resource persons on behalf of the LEAD Nepal. Ms. Khatoon stated that she was very happy to see the excitement over participants faces throughout the day and wish all the participants would be able to get something from this programme.

Mr. Rishi Raj Acharya closed the programme with his remarks. He stated that it was our victory to put ground level stakeholder at one forum and made them engage practically. He also thanked LEAD Nepal to organize such a informative and practical workshop and request to organize such kind of program in future too. He also acknowledged effort of Junko Fujioka.

Finally, Ms. Junko Fujioka and Mr. Rishi Raj Acharya distributed the masks and gloves to the waste workers for maintaining health safety at work station.



*Figure 22: Distributing gloves and masks*

#### **Voices of Women:**

The story and experiences of seven women who are actively engaged in waste management since long period of time were recorded for “The voices of women”. Prof. Ananda Shova Tamrakar, Ms. Anju Shah Singh, Ms. Muna Neupane, Ms. Kamala Shrestha, Ms. Reenu Thapaliya, Ms. Aisha Khatoon and Karuna Adhikaree were interviewed. The detail of the guiding questions and interviewees is listed in the Annex I and IV.

Media Training workshop on

### **2.1.8 Marking the international Days**

#### **2.1.8.1 Global Recycling Day**





*Figure 23: Group photo after the programme*

Two days programme on Global Recycling Day was conducted in Kathmandu, Nepal in 13 and 17 March 2019. The program was conducted in Stephens School Kathmandu, Nepal. Over 108 students participated the programme. LEAD Nepal organized knowledge sharing within the teachers and students about the theme and concept of Recycling on 13 and art and craft competition programme on 17. .

#### **Day I (13 March 2019):**

LEAD Nepal organized knowledge sharing program through presentation on Global Recycling day and recycling of the discarded materials. Total of 25 students from grade 5, 6 and 7 attended in knowledge sharing programme along with some teachers. Ms. Aisha Khatoon and Ms. Karuna Adhikaree explained about the mission and objectives and of the program.

After the presentation, informal meeting was held with school coordinator Salima Khatoon. The Art and Craft Competition was set for 17 March 2019 and roles and responsibilities of two parties were also set. It was decided to call all the students of grade 5-7 for art competition and 1-4 for craft competition. Whereas, grade 1-2 students will be the recycling ambassador as a little recyclers.

#### **Day II:**

On March 17 the Global Recycling Day Program was held and students were divided into 3 groups:

Drawing competition: Grade 5, 6 and 7

Craft Competition: Grade 1, 2, 3 and 4

Little Recycler: Grade 1 and 2





decorative craft out of plastic bottle, paper and newspaper, etc. Also grade 1 and 2 were mobilized as a little recycler around the school motivating student with their rhymes carrying a recycled dust bin. The students and teachers were very excited to put the trashes into the bins that were carried by the little recyclers.

After finishing the drawing and craft competition, LEAD Nepal and teachers jointly had a meeting and decided the winners of the competition. On the basis of their creativity, idea and theme, winners were selected. Ms. Aisha Khatoon, CEO of LEAD Nepal and Ms. Salima Khatoon, Coordinator of Stefen School distributed the prize for all the winners. LEAD Nepal also distributed recycled pencils to all the participants as a token of love for acknowledging their participation in the competition. School management highly appreciated the program and requested to organization such a knowledgeable program in the future as well.

Grade 5, 6 and 7 were orientated to draw on the theme “Recycling into the Future” whereas grade 1, 2, 3 and 4 were orientated to make a craft by using waste materials.

Grade 1, 2 and 3, 4 were divided into two groups and orientated to create a beautiful and





### 2.1.8.2. World Environment Day 2019 “Beat the Air Pollution”



*Figure 24: Distinguished guests of the World Environment Day 2019*

The World Environment Day 2019 was organized with joint initiation of LEAD Nepal, UNEP, Ministry of Federal Affairs and General Administration (MoFAGA), Kageshwori Manahara Municipality, Russian Center of Science and Culture and PHD Association. The Chief guest was Dr. Krishna Prasad Oli from National Planning Commission, Mr. Krishnahari Thapa Mayor from Kageshwori Manahara Municipality was the Chair and other guest Mrs. Aisha Khatoon CEO of LEAD Nepal, Mr. Rishiraj Acharya Joint Secretary of MoFAGA, Mr. Namgyal Sherpa Mayor of Solududhkunda Municipality, Mr. Dev Kumar Subedi Mayor of Birendranagar Municipality, Ms. Iuliia Androsova Director of Russian Center of Science and Culture, Dr. Dilli Aryal Chair of PHD Association, Mr. Madhusudhan Adikari AEPC and Mr. Tikaram Dahal chair of Solid Waste Management Association Nepal were on the dice.

The opening welcome remarks was given by Mr. Rishi Raj Acharya followed by Ms. Aisha Khatoon who presented the programme objectives linking waste to air pollution, clean water and soil pledging all to Beat Air Pollution by reducing waste at source and being responsible for the waste that we create.

The Chief Guest reminded all to be conscious of waste that you generate linking it to health, environment, soil, water and earth. All the guest had put their views linking waste to environment pollution so “not only a single day a every day is the earth day so we should take care of it on a daily basis. The Mayor of Kageshwori Manahara Municipality, thanked all for participation while presenting his closing remarks.

#### **Activities:**

**Songs from Stephens School:** The forty students of Stephens Schools with traditional costumes presented a song with the theme, “Clean Nepal - Clean Air. The song also made reference to the constitution of Nepal in which the right to clean environment and a healthy life is mentioned. The SDGs were also emphasized.



*Figure 25: Children performing songs on Environment Day 2019*

#### **Lunching of Documentary:**

The documentary on The Waste Management of Nepal and the trailer of the movie related to waste was lunched by Joint Secretary Mr. Rishi Raj Acharya (MoFAGA), Mayor Krishnahari Thapa Kageshwori Manahara Municipality and Dr. Sumitra Amatya.



*Figure 26: Launching ceremony of the short movie and documentary*

The documentary and the trailer of the movie Prayas was shown. All the audiences appreciated and commented positively.

#### **Presentation from the UNEP**

The audio presentation of Claudia Giacobelli, IETC was shared with the mass, which gave information on the IKI project. The presentation also highlighted the waste to circular economy concept and sustainability of the project.

#### **MOU Signing:**

MOU was signed between Lead Nepal, Ministry of Federal Affairs & General Administration and Birendranagar Municipality on strategy and action plan including a pilot project of a ward in Birendranagar. Another MOU was signed between Lead Nepal, Ministry of Federal Affairs & General



Administration and Solududhkunda Municipality on strategy and action plan.



Figure 27: MoU signing ceremony

## Certification:



Twenty students from eight different universities participated for the Photo collage competition and winners were presented certificate and prizes.


22 volunteers from different universities

assisted the program facilitation and appreciation certificate and t-shirt were distributed to them. Lastly at the end of the program signature campaign on the theme “We can do something about the quality of our air” was also held by Lead Nepal.



## 2.1.9. Youth Capacity Building

40 youths from Tribhuvan University were trained on the integrated waste management checklist and methodology of baseline assessment and data analysis. Resource persons from Central Bureau of Statistics delivered the common mistakes that enumerators do and uncertainties faced during the data analysis. He also gave some clues to come over of the problem with scientific way. The resource person from MoFAGA highlighted the role of ministries to liason with local level in the waste management data



collection and documentation. The resource person from Municipality Association of Nepal also highlighted the gaps on the waste management from the local government.

## ***2.1.10. Baseline Survey and Baseline Assessment Report***

### ***2.1.10.1. Development of the data archiving database:***

There were numerous meetings held with the different stakeholders in order to develop a practical database and templates and replicate the best practices within the country. The task of developing data base to archive the data of the waste management from the municipality was started before the PCA signing in October. LEAD Nepal contracted a national consultant who has deep knowledge and experience on IT and waste management. On the end of November, LEAD Nepal received the first draft of database which was then presented and discussed on the technical committee meeting. Based on the suggestion of technical committee meeting in November, LEAD Nepal also summarized the database and produce a data collection template in the printed version. The template tried to incorporate the gaps of the statistical absence of most of the municipalities that was reflected from the analysis of last baseline survey. Beside that, IT consultant also prepared a SPSS based database sheet for the baseline survey in order to archive the collected information in a scientific way.

### ***2.1.10.2. Sample Testing of the data collection templates:***

Based on the decision of the technical committee meeting on 28 November 2018, Kirtipur Municipality was chosen for the sample testing of the data collection templates. On 9 December 2018, team from LEAD Nepal met with the Mr. Ramesh Maharjan, Mayor and assistant Mr. Saraswoti Rijal Deputy Mayor of Kirtipur Municipality, Kathmandu and shared the statistic data template and the upcoming baseline survey activity with the questionnaire to be filled by the municipality. The team discussed of Kirtipur to be the first municipality to pilot statistic template and the municipal questionnaires was disused and agreed by the Meyer. The Meyer allocated a focal point to liaison with and arrange the activity on 10 December 2018. Based on this meeting a pilot for the statistic data template and the municipality baseline survey questionnaire was conducted on 10 December 2018.

Thirteen participants from different sections of the Municipality, representatives of the Health, Forest, Environment and Waste Management Committee and the representatives from the private sector working in door-to-door collection of waste attended the programme. The discussion was mainly focused on i) the current waste management issues and the role of municipality and private sector and the community ii) the benefit of data collection templates for municipality and the people of Kirtipur iii) The Municipality running with low staffing as one officer is responsible for health, forest, environment and waste management. Details of the meeting is shared on the attached meeting note.

### ***2.1.10.3. Develop questionnaire and finalize a survey modality for the extended baseline survey:***

The questionnaires were revisited thoroughly and added and cut out some questions with the experiences of previous survey. The survey questions for temple was added. The sample number were added for institutions and commercials category in order to get broader information. LEAD Nepal conducted formal and informal meetings with Central Bureau of Statistics (CBS) to discuss on their ongoing Economic Census to harness some relevant information on institutions and commercial establishments. Finally, LEAD Nepal is able to access the total number of institutions in a municipality. That also makes LEAD Nepal to plan the sample size for upcoming baseline survey. Along with this, LEAD Nepal hired an IT consultant to prepare a excel based entry sheet for each of the questionnaires.

#### ***2.1.10.4. Selection of the surveyor for extended baseline survey:***

LEAD Nepal followed the process of the previous baseline survey and extended the collaboration work with Tribhuvan University. Forty two surveyors were selected with the merit basis and provided them two days orientation.

#### ***2.1.10.5. Orientation workshop for the enumerators***

Forty-two enumerators from Tribhuvan University were selected for the base line survey. They were given two-day orientation workshop before sending them to the field. The workshop went through all the questionnaires step by step and explained the importance the impacts and the expected output. MoFAGA the technical committee and LEAD Nepal facilitated the workshop. Mr. Sushil Sharma, Chief of Environment Statistics presented on the importance of data collection its challenges and the different practical issues that will arise during the data collection process. In addition, the role of CBS and its collaboration with LEAD Nepal was also shared. Ms. Sakina Khatoon, computer expert, imparted training on Geo Tracker a GPS tracker. Ms. Aisha Khatoon, Executive Director and Ms. Karuna Adhikaree, Programme Officer went through all the questionnaires in detail explaining each and every compartment. Mr. Rishi Raj Acharya, Chief of Environment and Disaster Management, MoFAGA gave the opening and closing remarks of the two-day orientation workshop.

#### ***2.1.10.6. Questionnaire data verification and analysis***

During the reporting period extensive work was done on reviewing the questionnaires that was submitted by the 42 surveyors after their data collected exercise from the 21 municipalities across seven provinces of Nepal. There were several meeting and communication between the enumerators, LEAD Nepal and the consultant in order to cross check the data and fill the ones that were submitted vacant. Two months were put in the data verification and cleaning process, which was time consuming and a difficult process. Finally at the end of the reporting the team completed the task of data verification and cleaning. The Technical Committee has been briefed through the entire process.


#### ***2.1.11. National and City level Strategy on Integrated Waste Management***

Planning the waste management or all of the waste produced in Nepal is an enormous task which involves both logistical planning and scientific knowledge and understanding in order to balance the impact on the environment, health and the cost effectiveness of the process. It is important to remember that Nepal's resources and landfill sites are limited and this has a major bearing on the kind of activities we carried out. Effective waste architecture and environmentally friendly resource recovery facilities play an extremely important role in the global cleanliness and sustainability drive, with people's health and the conservation of resources being the responsibility of every individual.

In the modern world burying all of our rubbish is not a sustainable solution. While primitive humans produced very little waste, and that which was produced would biodegrade quickly, modern humans produce much larger amounts of waste, much of which is not biodegradable. Additionally, many types of waste may be damaging to the soil, ground water and surrounding habitat.

The most important reason for waste management is the protection of the environment and the health of the population side by side making waste management financially sustainable.

Proper waste management can help conserve our planet's natural beauty, which can be flawed by thoughtless disposal of waste, fly-tipping and senseless littering. Landscapes can be ruined through littering and places of tourist interest can lose their attraction; it is also a blight for those who live in areas where waste collection and recycling is not managed effectively and responsibly. Natural beauty is a



legacy and a right for future generations and conserving it, as well as our natural resources, for their benefit is our responsibility today.

### **2.1.12. Gender and Waste Nexus Assessment**

LEAD Nepal facilitated the Gender mainstreaming mission on June from GRID Ardenal. SWMTSC facilitated the visit to Sisdol landfill sites of Kathmandu. The aim of the visit was to integrate gender concerns in the planning budgeting and implementing programme within the waste and climate change project.

Selected findings/observations:

Gender roles

One male and two females from three different households representing various social groups and castes were interviewed on waste prevention, general, segregation and household waste disposal. The interviewees confirmed that household roles generally are well divided between men and women giving that woman are more responsibility for waste management at home. Women are also responsible for cooking in many households and manage therefore the kitchen waste, which, according to the baseline study forms around 56 per cent of total waste generation in Nepal.

Considering the role dynamics in households and assuming that the situation won't change in the nearest future, there is a great possibility that women play an important role in segregating between wet and dry waste at source in such a way considerably improving recycling of garbage, reducing the costs and environmental impacts. It is easier to convince women than men that segregation is important.

Socio-economic parameters are underlaying ground for waste management in general. Ethnic groups and caste affiliations have determined particular roles in society, also connected to serve systems such as rubbish collectors, street sweepers and others. It has been observed that the culture is changing in Nepal and the gap between the castes is slowly narrowing. For instance, many individuals from Pote caste<sup>1</sup> worked in the waste sector, but this situation is changing. Lately, there is more diversity representing different castes in the waste sector.

Roles in the waste sector are very segregated. It has been observed that women are responsible for sweeping, primarily waste segregation at transfer stations, collecting payments from households etc. Women are also often taking on handicraft works. It has been indicated that it is difficult for women to take on management positions, because the "system" doesn't really support that (interview with Khaalisisi Friends – established by a young female entrepreneur).

Females work both dependently and independently of men. It has been observed that female scavengers are independent in their positions, they can decide by themselves. They are more independent with the earnings, for instance. Whereas women in transfer stations are very much dependent of men (e.g., registering weights of collected recyclables is done by men, they are not paid out right away but once a month).


It was observed through the interviews that women scavengers have intelligent reflections and have potential for education and development. It is clear that these human resources are heavily underused. With some support and education these females can also run their own waste recycling enterprises. At present there are a number of obstacles.

Men tend to be drivers of smaller and bigger trucks, waste pickers by bicycles, and are in management positions. It is believed that those jobs are fitting men more. It has been observed that men often oversee the work of women (example of the NePSEMAC transfer station). There are also men (and boys) waste pickers, but proportionally the numbers are lower.

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<sup>1</sup> Lowest case . - Fishermen, sweepers, traditional executioners





Roles are divided not only by sexes but also by ethnical groups. It was observed that the majority of waste pickers by bicycle and waste traders are Indians, and the vast majority of men come from North India but they are living in Nepal to earn money. Many of these men have families back home in India. Waste pickers are also vulnerable females often migrating into the city to earn some money.

Gender disaggregated data is not collected in a systematic way. It is therefore challenging to address any gender sensitive policies. It should be followed up with some interviewees e.g., Solid Waste Management Technical Support Centre on female driver entrepreneurship.

### **2.1.13. Technical Committee Meetings**

About several technical committee meetings were held on 26 July 2018, 13 October 2018, 28 November 2018, 10 February 2019, 13 March 2019, 10 April 2019, 13 May 2019 and 19 August 2019. The meetings were basically to update the project execution and take permission for further interventions, review produced documents and collect feedbacks and suggestions.

### **2.1.14. Communication and Outreach**

Subha Media was selected as the consultant for producing a short movie and a documentary on integrated waste management. Several meetings were held between MoFAGA, LEAD Nepal and Subha Media so as to have a clear objective and vision with the right message targets. Based on the objectives and the vision the concept note was drafted by Subha Media. Upon much reflection the concept was finally approved and the script was drafted by Subha Media, which was again reviewed thoroughly by LEAD Nepal, MoFAGA, the Technical Committee and UNEP (IETC).

After approval of the script, Subha Media selected actors and the shooting began finally the edited version was completed within the deadline and the movie and the documentary was launched on 10 June 2019 while marking the World Environment Celebration Day at the Russian Centre for Science and Culture.

The audiences appreciated the visual effects of the documentary and movie and said this was the first time in Nepal and the visual effects is so powerful that individuals and institutes will definitely think twice before discard their waste.

The short movie and documentary can be viewed in the link below.

<https://www.youtube.com/watch?v=u5U-gn1xrgI&t=657s>

<https://www.youtube.com/watch?v=z7lgAq2fXeI&t=169s>

## **2.2. Disaster Waste Management- A Holistic Approach for Nepal Project**

### **2.2.1. Proposal Development and Approval from the UNEP IETC and SWC**

LEAD Nepal developed a proposal on Disaster Waste Management of Nepal with the technical support from UN Environment International Environmental Technology Centre (UNEP IETC). The proposal was developed to achieve following objectives:

- Updating the 2015 National Disaster Waste Management Policy Strategy & Action Plan and mainstreaming DWM into Solid Waste Management Policy, Strategy & Action Plan.

- Demonstrating a Disaster Waste Recycling Unit at the Municipality level in Lalitpur Metropolitan City; and
- Disaster Waste Management Communication and Outreach material in the context of Nepal.

After the lengthy process of UN system LEAD Nepal awarded USD 50000 to execute the project. Ministry of Federal Affairs and General Administration is chosen as the national implementing entity from the government counterpart.

LEAD Nepal got approval from the Social Welfare Council to implement the project in 2019.

## 2.2.2. National, Regional Consultations

### 2.2.2.1. Inception Workshop (12 February 2019)



*Figure 28: Group photo after the opening session of the workshop*

A one day inception workshop on disaster waste management (DWM) was jointly organized by the Ministry of Federal Affairs and General Administration (MoFAGA), Government of Nepal, UNEP International Environmental Technology Centre (IETC), and the Leadership for Environment and Development Nepal (LEAD Nepal) on 12 February 2019. 45 participants from the Ministries, departments, municipality, I/NGOs, research institutions, academia and media working in the disaster risk reduction, waste and sewage management sector attended the workshop.

The main objective of this consultative workshop was to present, share and discuss the disaster waste management project funded by the UNEP IETC and implemented by the LEAD Nepal in the leadership of the MoFAGA. The specific objectives were to:

- Share the planned activities of the Disaster Waste Management: a Holistic Approach for Nepal and their implementation strategy and plan.
- Collect suggestions, comments and feedbacks of the stakeholders to effectively implement the activities.

#### **Opening Session:**


During the opening session of the workshop, seven distinguished guests welcomed the participants followed by sharing the objectives of the workshop and requested for an active participation in the programme.

The workshop was graced as Chief Guest by Honorable Ms. Pampha Bhushal, Member of the House of the Representative. She thanked and congratulated the organizers for timely discussion on the important topic of disaster waste management. She also thanked the UN Environment and international experts for the opportunity to learn from their experiences as well as urged the organizers and the participants to provide inputs in finding home-grown local solutions on disaster waste management. She also shared her expectation that such interactive stakeholder sessions will provide inputs in strengthening and amending the Waste Management Act and Policy as a unified Act with full integration of disaster waste issues together with regular waste management concerns. As a representative of the policy makers, she pledged her commitment to raise her support in taking forward the Act in various sectoral committees at the Parliament.

Another distinguished guest Mr. Rishi Raj Acharya, Chief, Environment and Disaster Management Section, MoFAGA greeted and welcomed the participants and invited speakers. He informed that despite many Act Policy, Strategies and Plans in place for the regular solid waste management, and disaster preparedness and reduction, the term 'disaster waste' is missing. He hence reiterated the importance of such discussion programmes and projects as a step forward for the integration of disaster waste into Nepal's Waste Management Act. He also raised the need for capacity building of the national as well as provincial and local level governments in integrating disaster waste management into their annual plans. Mr. Suresh Adhikari, Joint-Secretary, MoFAGA highlighted the waste management is one of the environmental, economic and social challenges, especially in the urban areas. The challenges lie at all levels including- resources, knowledge, equipment, machinery, lack of space/land etc. He thanked LEAD Nepal for projects on waste management, however, urged others to add in the efforts to integrate and institutionalize disaster waste management for the achievement of sustainable development goals. Adding in the new federal structure that Nepal is currently following, he said development partners should tap the enthusiasm (and competition for the development) of the provincial and local government to instill and implement sustainable development opportunity and replicate the good practices in their constituency.

Dr. Sindhu Prasad Dhungana, Joint-Secretary Ministry of Forestry and Environment (MoFE) highlighted the fact that MOFE being the focal Ministry for the environment and serving as the secretariat and coordinating body for various multilateral environmental agreements (MEAs) is committed to environmental conservation including waste management concerns. He also highlighted the need for the balance between development and environment, and hence sustainable development is the only way forward. He highlighted that disaster waste is an unintended waste and is a serious subject matter that needs attention and preparedness. He also thanked the organizers for the timely organization of the workshop as Nepal is undergoing revisions of the various Acts, like the Environment Protection Act. Under such revision period, we should capture the opportunity to make our policies and plan more preventive rather than reactive and inclusive and holistic by introducing the concepts of precautionary principle, polluter pays principle, public-private participation etc.

Prof. Tang Ya, Sichuan University, China shared the experiences of disaster waste management issues in China. He shared that DWM is a challenging issue not only for Nepal but elsewhere too, because of its massive quantity, complex composition and hazardous nature as well as lack of resources and knowledge.



Nonetheless, incidents of disaster instigate studies and guidelines for future. He thanked the organizer for the opportunity to share his experience and learn from the participants. He informed that Sichuan University created an institute for disaster management and reconstruction as a hub for education and capacity building. He also showed his interest in working together on disaster waste management.

Mr. Mahesh Pradhan from UNEP IETC as a co-organizer thanked the distinguished guests for their time and commitment towards integrating disaster waste management into national policies and plan. He also welcomed the participants and encouraged to participate actively. As a representative from the UN, he expressed to continue working together with the Government of Nepal to become prepared and resilient at the times of disaster. He also acknowledged the efforts of the implementing partner LEAD in promoting the issues of DWM to wider stakeholders and its contribution in framing DWM strategy and action plan. He also introduced to three components of the DWM project: (i) Policy component- development of DWM strategy and action plan, (ii) Implementation- Demonstration project in Khokana, and (iii) Communication & Outreach activities

The opening session was closed with the vote of thanks from the Chair Dr. Sumitra Amatya. She highlighted the need to include the principles of 3Rs (reduce, reuse, recycle), 3Rs (response, recovery and reconstruction), and 3Bs (Build Back Better) while managing disaster waste. She also thanked MoFAGA for taking the guardianship in sensitizing, integrating and implementing DWM agenda, however, requested that DWM should be the 'collective agenda' of all the concerned ministries and stakeholders.

#### Technical Session 1: Strengthening the DWM Strategy and Action Plan


This session presented the baseline survey and the DWM strategy and action plan prepared by the LEAD Nepal in 2015. These documents were the deliverables of the component one of the UNEP IETC funded DWM project implemented by the LEAD Nepal in collaboration with MoFAGA.

Mr. Purna Chandra Lall Rajbhandari made the first presentation on the baseline survey of disaster waste mapping after the 2015 earthquake. The findings from the survey were used to develop the DWM strategy and action plan. His presentation also covered the state, trend and types of hazards and disasters in Nepal. According to the report by the Ministry of Home Affairs (MoHA) in the past 45 years, the number of disaster incidence is increasing every year in Nepal, and during past two years alone, 2,940 incidents of disasters were reported. His presentation also highlighted that despite such frequency of disasters in Nepal, disaster waste has not found place in studies, assessments, discussions and policies.

Following the baseline survey, LEAD Nepal developed DWM strategy and action plan in 2015. The process and content of the strategy document and the process and achievement for the endorsement of the DWM strategy and action plan was shared by Dr. Sumitra Amatya. She presented that though there is a lot to be done in the area of DWM, there had been a few good intentions and activities in place. For instance, a study by USAID in 2014 on Kathmandu Valley earthquake debris management strategic plan 2014. Similarly, post-2015 earthquake the Disaster Recovery Framework 2016-2020 has been developed to accelerate the recovery and reconstruction process. Despite such efforts, there are still a couple of challenges in the DWM sector. These challenges include; lack of human resource capacity (who are the DWM experts?), lack of funding support in demolition and disaster waste management (donor funding targeted to reconstruction), lack of coordination among government ministries and agencies in taking the leadership in carrying the agenda of DWM, reactive rather than proactive plan of actions etc. She also highlighted the fact that even after the finalization of the documents, its enforcement requires governance, context and resources at all levels of the government- Federal, Provincial and local. Dr. Amatya, towards the end of her presentation shared that the DWM Strategy and Action Plan is in the process of updating and seek feedback and inputs from the participants and documented for the improvement.

#### Technical Session 2: Pilot Demonstration of Disaster Waste Recycling Unit





Mr. Pradeep Amatya presented the Lalitpur Metropolitan's plan on establishing a material recovery facility (MRF) in Khokana. The MRF is planning to include disaster waste as one of the components to be recycled. The MRF will also serve as the temporary storage site of disaster waste. The estimated cost of the MRF is NRs. 30 million (exclusive of the land cost). The municipality is planning to engage the household whose house has been damaged in the disaster. The idea is to segregate demolition waste, grind and convert to interlocking bricks. Together with MRF, Lalitpur Metropolitan is also planning to construct a Disaster Museum as a part of disaster education and awareness centre and a memorial. In his presentation, Mr. Amatya also presented the statistics of the 2015 earthquake damage in Lalitpur district. It was estimated that 4 million cubic meter of disaster waste was generated in Lalitpur. Those disaster wastes were mostly dumped along the banks of Bagmati river, while the waste from heritage sites were stored at the UN park. After the 2015 earthquake, the Metropolitan realized the need to designate the disaster waste storage area and recycling and reuse centres, hence, the MRF planned in Khokana added the disaster waste as a component to be managed. Though the MRF is in the priority of the Metropolitan government, it was difficult to find suitable land area for the MRF, as local communities do not want the MRF next to their locality. Nonetheless, Lalitpur metropolitan has identified 2-3 potential sites.

Technical session 2 was followed by another presentation on the use of recycled construction & demolition (C&D) waste in green retrofitting of the hospitals. Dr. Santosh Shrestha, Senior Earthquake Resilience Adviser, DFID/NHSSP-III presented two cases of Western Regional Hospital Pokhara and Bhaktapur Hospital green retrofitting. In these projects, the demolition waste generated during the building retrofitting were crushed and reused as aggregate blocks/slabs and used in the pavements. He also highlighted that there is lack of understanding on the concept of 'retrofitting' both at masses and at policy level. He introduced that retrofitting includes not only seismic strengthening of a building but also structural retrofitting and functional retrofitting. Adding the green building concept into retrofitting includes C&D waste recycling and reuse as construction material, improving energy efficiency and overall environmental performance of the building.

#### Technical Session 3: Communication & Outreach

Ms. Aisha Khatoon, CEO LEAD Nepal and Mr. Saroj Khatri from Subha Media presented the objective and concept of the documentary drama (50 min) and documentary-clip (7-10 min) on disaster waste management that LEAD Nepal is producing as public education and awareness material. As part of the third component of the DWM project on Communication & Awareness raising, these media materials are expected to be launched on the World Environment Day and be telecasted on Nepal Television as well as widely disseminated using various social media platforms, and to local municipalities and schools and colleges.

Japan, a country that is jolted with frequent and severe disasters have come a long way in training the city's workforce who has the ultimate responsibilities of providing rescue, relief, recovery and reconstruction activities during and post-disasters. Ms. Qing Xu from UNEP IETC took the participants through the training curriculum and materials (table-top simulation exercise) developed by Japan on disaster waste management. Her presentation was an opportunity to learn from international good practices. The suggestions were collected and documented.

#### **Closing Session:**

The workshop was ended with vote of thanks from Mr. Rishi Raj Acharya, MoFAGA and Mr. Mahesh Pradhan UNEP IETC. The closing remarks also reiterated the inputs and suggestions collected during the workshop as the 'next-step' actions for LEAD Nepal and MoFAGA in implementing the DWM project successfully and generating the intended impact of sensitizing and preparing Nepal on disaster waste management. Some of the next-step activities includes;

- Updating and strengthening the DWM Strategy and Action Plan 2015 and sending it for the endorsement

- Piloting the DWM recycling unit in Ward 21, Lalitpur Metropolitan City
- Developing proposals for DWM training and capacity building of local governments

### **2.2.3. Bilateral Meetings**

LEAD Nepal held several bilateral meetings with MoFAGA, UNDP, ICIMOD, Tribhuvan University, Pokhara University, Sichuan University of China, Kyoto University of Japan in the issues of DWM and further collaboration.

### **2.2.4. Baseline Survey and Baseline Assessment Report**

#### **2.2.4.1. Disaster Waste Management Field Observation Visit to Larpak and Barpak of Gorkha District (29-31 March 2019)**

##### **Objective:**

- To observe and collect information on the disaster waste material recovery technology and practices in Barpak and Larpak, the epicenter of Nepal Earthquake 2015 of Nepal.
- To explore the potential collaboration with the company working in the field of construction material production and disaster waste material recovery;

A field visits to the two village of the Gorkha district named Barpak and Larpak, which are located near to the Gorkha 2015 earthquake epicenter. The damage to the houses and infrastructure was very high. The team had three days visit to the area to observe as well as discuss with the locals specially focused on the Disaster Waste and its management. The team members have collected information about the present disaster waste management situation in these two villages.

##### **Barpak: Settlement of Gurungs**


Barpak a densely populated settlement with more than 1400 houses is a scenic town in northern Gorkha district. This village is hometown of Victoria Cross soldier Gaje Ghale. This village has been known to the world due to the 2015 Earthquake whose epicenter was near to the village affecting the nearest settlement. More than 1300 houses were destroyed killing about 72 people. As it has been nearly 3 years of the 2015 Earthquake, the visiting team could find several earthquakes affected houses are temporarily build with the tin and wood to have temporary arrangement but several houses are completed construction and maximum houses are under construction with the modern construction architecture and materials.

##### **Disaster Waste Management Situation Observation:**

Compare to the Larpak, Barpak settlement's economy is better. There has been lot of buildings are under construction with the modern architecture as well as retaining older architecture using the older buildings waste material as well as modern construction materials. It has been also observed that the newly constructed building is complying the building code for earthquake resistance build with lentils on the stone as well as in brick walls.

The team members observed disaster waste building materials like stone and wood were piled up beside the destroyed houses for the use when the building will be constructed. Several buildings are under construction where the team has observed both stone generated from the damaged houses and red soil bricks were used as construction materials. These red soil bricks are not made locally in Barpak but it is brought from southern plain Chitwan. There has not been sign of construction of houses using interlocking bricks. It was observed that several houses used to cut the earthquake damaged waste stone in the size of bricks to put on the wall for outer stone building look.

There some of the building still standing as it was damaged outside and also the household used stuff scattered around. The local has informed that the building construction materials waste generated after earthquake is maximum under used in construction of buildings which is almost 90 percent plus. The household stuffs not useful were throwing to rivers and stream and burnet. The team also observed one



local lady was carrying the old tarpaulin used for the tent during the earthquake event to take it to the down side of settlement to burn as waste (Photo). It was also observed the small waste burning furnace in front of the ward office which was in operation and a lady was bringing the waste plastics of noodle to burn.

**Conclusion:**

C&D debris from demolished buildings and collapsed road and bridges offer several opportunities for recycling and reuse. Bulky, heavy materials such as masonry, bricks, blocks, and concrete can be crushed into aggregate and reused in road reconstruction or as fill. Lumber, vegetative debris and other wood products can be directly reused or ground and used for boiler fuel, mulch, and engineered lumber. Treated wood and wood painted with lead-based paint should be removed from wood meant to be recycled as mulch or composted. Asphalt shingles can be recycled into new asphalt pavement mixes or used in cement production. Gypsum drywall can be recycled into new drywall, cement, and agricultural uses. Metal can be recycled back into metal products.

**2.2.4.3. Field Visit Report of Activity 1 and 2 of Disaster Waste Management Project (19 March 2019)**

**Objective:**

- To observe and collect information on the disaster waste material recovery technology and practices in Nepal;
- To explore the potential collaboration with the company working in the field of construction material production and disaster waste material recovery;

The five-member team along with Member of Parliament of Province #3 representative of Lalitpur Constituency #2 visited the construction material production site which are also engaged in using Disaster Waste construction material recovery and recycling by producing interlocking brick and normal bricks. The team also visited sites where these recycled materials made bricks used for the construction of houses with support from Rotary club. The team visited total four sites. These sites located in: Harsiddhi, Lele and Bhurunkhel. The details of the site with picture is presented below:

**HariShiddhi Inter-locking Brick production Site:**

**Site 1:** The site consists of a well-established facility which has both manual and automatic interlocking brick making casting machine. But currently the manual machine has been in operation in which few people was casting the interlocking brick using the sand cement mix material. These interlocking brick casting machines was brought from Asian Institute of Technology. Currently using this interlocking brick, the two-story houses are constructed. This brick is used widely in nearby houses as partisan in RCC buildings.





**Site 2:** This site consists of the automatic interlocking brick making machine which is currently not in operation. This site use to be in operation around one year back, but due to issues of three phase electricity supply connection, this has been not in operation now.



#### Lele Brick producing site:

The team visited Brick producing site which is located in the Lele area in Southern part of Lalitpur districts. The plant here produces the bricks in the normal size and shape which is commonly used for the building construction. There are more than million bricks which is made using sand and cement. There were also around more than thousand red color brick which was made of the crushed brick produced by the Earthquake disaster of 2015. According to producer the cost of the disaster waste bricks uses to be costlier than the cement concrete brick. Because of this cost difference, they are not producing bricks made using the disaster waste generated bricks.

The factory is using the automated machine to produce these bricks which uses the Cast of 24 brick in one press. Several houses in the locality is currently using this cement sand mixed bricks for the construction of house as each brick cost Nrs. 13 rupees. These factories are operational where there is demand for the brick. Currently, the produces have more than a million of bricks in their stock.



#### **Bhurunkhel Rotary Constructed Buildings for Earthquake affected people:**

The team has also visited the Rotary constructed buildings to resettle the earthquake 2015 affected families. These houses used the sand- cement mixed bricks which was produced from the Lele factory. The photos of the houses are given below.

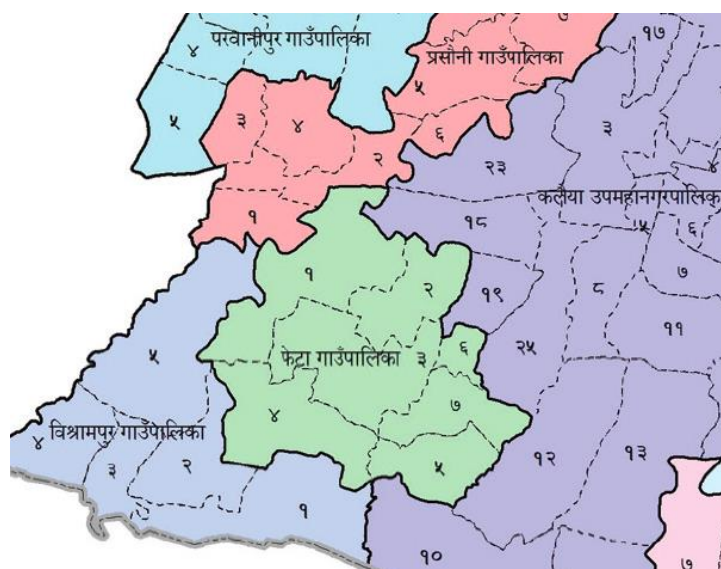
#### **Conclusion:**

While Nepal has come to rely on brick and concrete as the main material for building construction, brick and concrete could harm the environment more than it is helping. It consumes more than 16% fossil fuel to turn those material into construction material. It is the mater of Natural resources conservation as well. So the team has come on conclusion that every sector need to promote the green materials and save environment and Natural resources.

#### **2.2.4.4. Field Visit to Bara Parsha and Janakpur Pheta Rural Muniaplity, Bara District**

Pheta Rural Municipality is located in the Bara district adjoining Parsa district and near to Birgunj Metropolitan city connected by the road. It has total population of 30,786 covering 26.10 Sq km having the population density of 1180 person per sq km

In evening of 31st March 2019, the high wind and storm event hit the villages of Bara and Parsa District of Province #2 in Southern Plain of Nepal. Thousands of people have been rendered homeless. The Ministry of Home Affairs (MOHA) released statement mentioned the event killed killed 28 people in which 27 in Bara and one in Parsa (10 male, 11 female and 6 children) district destroying 940 houses and causing varying degree of damage to 955. The total people injured were 668 in which majority of the injured are from Pheta and Bhulahi Bharwaliya areas in Bara's Pheta Rural Municipality, which have mostly been affected by the hailstorm. Engineers and planning officers attended the discussion on the current tornado effects around the city and its emergency, relief and recovery work that has been carried out with the help of several organizations.



The team visited the Tornado affected area in the Pheta Rural Municipality and met with official of the municipality. The team interacted with the people and took interview in the Bhalui tole village of ward 1, and other affected wards 3, 6 and so on. The maximum damage has been observed in the ward # 6The team observed the destruction left by the tornado event in terms of the damaged buildings, crops, horticultures trees and vegetation. It has been reported that 28 people in which 27 in which 27 in Bara and one in Parsa (10 males, 11 females and 6 children). it was reported that around 940 houses and causing varying degree of damage to 955.

#### Observation from disaster from disaster waste generation and its management point of view:

- The type of houses in the observation of damaged to the buildings:

| House type in Pheta Rural Municipality   | Damage status   | Type of Disaster waste                 | Risk to tornado event | % of houses (Rough estimation) |
|--|---|--|-----------------------|--------------------------------|
| Mud & bamboo wall with thatched roof     | Totally destroyed   | Bamboo, thatched material, wood        | Very high             | 15 %                           |
| Mud & Bamboo wall with tile roof         | Totally destroyed   | Bamboo, thatched material, wood, tiles | Very high             | 20                             |
| Mud brick wall with tile roof            | Wall destroyed and roof tile was removed and thrown around        | Bricks, wood and tiles                 | High                  | 30                             |
| Mud brick wall with tin roof             | wall destroyed and tin roof was blown away                        | Bricks, tin and wood                   | High                  | 15                             |
| Cement brick wall with tile roof         | Minimal damage of walls and tile was removed and scattered around | Bricks, , wood , tiles                 | High                  | 10                             |
| Cement brick wall with concrete rcc roof | Observed damage of walls in house and one or two slab was         | Bricks, concrete slabs structure       | Low                   | 7                              |



|  |                             |                                  |                                  |          |   |
|--|-----------------------------|----------------------------------|----------------------------------|----------|---|
|  |                             | destroyed after collapse of wall |                                  |          |   |
|  | RCC structure with RCC roof | No damage observed               | Brick walls, some concrete slabs | Very low | 3 |

- The affected areas settlements are of mostly farmers and workers going to middle east. This settlement consists of individual houses and some local small rice mills. Most of the houses type vary from thatched to tile roofs with mud bamboo wall to brick walls. Very few rcc concrete structures are found but the cement mortar brick wall with tile room and few concrete roofs was also observed.
- Most of the thatched and tile roof of the houses are almost completely destroyed. Similarly, bamboo mud wall and mud brick wall were damaged severely compared with the cement brick walls. Very minimal damage observed in the cement brick with slab houses. In few cases as the wall constructed with cement wall will pillar having slab roof was observed collapse.
- The type of disaster waste materials generated in the Pheta Rural Municipality by the tornado event was: Thatched roof material, Bamboo and Mud from mud wall, tiles, bricks and cement mortar, tiles made of clay and cement concrete, house hold electric appliances (rice cooker, TV), CFL & LED bulb, household utensils

| Type of waste generated                   | How it will be disposed  | Recycle Status |
|---|--|----------------|
| • Thatched roof material,                 | Decomposed or used by local to burn or dumped in field   | Very high      |
| • Bamboo and Mud from mud wall,           | Mud dumped in the field and bamboo utilized for construction purpose   | Very high      |
| • Tiles made of clay and cement concrete, | Broken tiles will be used for filling the depressed/ lower water logging land; good tiles will be used for roofing   | High           |
| • Tin sheet and metals                    | Damaged tin sheet & metals will be sold to scavenger   | High           |
| • Brick and cement mortars                | Broken bricks and mortars will be used to fill the lower/depressed water logging land area or on the road, good shape bricks will be reused for construction                                   | High           |
| • Household Utensils                      | Reuse good one and damaged one will be sold to scavenger with exchange of money or with kinds  | High           |
| • Concrete slab                           | Concrete slab will be braked in to pieces and the reinforced iron rod will be reused or sold to scavenger and broken pieces will be thrown to field or fill the lower land area or on the road | Medium         |
| • Electric appliances (rice cooker, TV),  | Sold to scavenger  | Very high      |
| • CFL & LED bulbs and tube                | Thrown to some field or in road side dumping area  | Very low       |

- People of the affected houses were in the tent provided by the government and relief organization.
- Destroyed houses owner were staying in the tent putting all their food grains produced from the farms

- Government will be constructing the houses for the people whose houses were destroyed and damaged in the Tornado hit area
- The team member observed several local rickshaw full of tin sheet and metals were carrying from the villages. The driver of rickshaw informed that the material would be carried to the collection center in Birgunj. They have collected it from the disaster houses with the rate of Nrs 5 to 10 per KG.
- The field visit was commissioned 28th days after the disaster event and observed people start collecting and evaluating their disaster generated waste and the waste collectors/vendors became active to buy the useful waste in the area.
- It was also reported that the owner of the damaged houses are not clearing their waste of the damaged building because of the government provision of construction of houses for the victims. The affected family are insecure if the house damaged evidence is not there then their name will be not included in the government list of the victim receiving house. Team member also experience the people in the affected village insisted team member to visit their damaged house and document the losses.

**Point discussed with the Pheta Rural Municipality:**

- Municipality has been created one year before, so it does not have enough human resources and officials to carry on the duties, even it is having a smaller number of staff for delivery of day to day activities and services to the people;
- There is no waste management activities so far in the municipality, there is no dedicated environment unit in the office, so far only one engineer is commissioned to look after the activities of engineering construction related activities who is also looking after the technical matters in the municipality.
- Query on how the disaster waste generation will be managed to the officials who is responsible for the technical matter related to environment also informed that considering the rural nature of the village with farmers community and available agriculture field the waste generated which is most organic in nature will be used by the villagers. The broken and unused bricks and mortars will be put on the roads and roadside or in the potential water logged area.
- The officials also informed that the office has only two tractors/tipper with it as machinery to carry the stuffs.
- The official informed that the disaster waste scattered around the affected houses we can see until the 28<sup>th</sup> days after the event because of people's insecurity whether their names are on the list of new houses, if it would not have been there then the people have been cleared all the waste materials by now as several waste collector vendors from Birgunj are coming to the affected wards.
- The officials were not aware about the disaster waste management concept on which the field team has briefed the emergence of the disaster waste management concept and issues and role of the municipality in handling the huge amount of waste generated during the disaster event. A Disaster waste management guideline for Asia-Pacific has been shared with the Municipality team through the email.

**Gaur Municipality:**

Gaur Municipality is located on the side of in between two-river system Bagmati River in East and Lal Bakaiya River in the west in the flood plain having area of 21.53 Sq Km. Gaur is a very old settlement having the population of 34937 distributed in 9 wards. The type of the houses varies from traditional mud brick wall with tile to the recent strong RCC structure as trends urbanization and modernization is happening in this municipality. Mayor along with few officials attended the discussion on the recent tornado effects around the city and emergency and relief works that has been carried out.

**Pont discussed:**

- Mayor Mr. Ajay Gupta appreciated the sharing of the concept of the Disaster Waste Management which is one of the issues during post disaster event. He informed that this issue is not serious at this stage as still the nature of the settlement of the municipality is of rural in nature with the mud bamboo wall and tile roof or mud brick wall. But the trend of urbanization is increasing with the construction of RRC and cement concrete buildings and expansion of settlements. Mayor realised this might be the issues in future and due to it will be addressed.
- Chief Administrative Officer Mr. Suman Karki was also informed about the disaster waste management concept and its importance in the post disaster event. Mr. Karki informed that the Municipality has prepared the draft Disaster Risk Reduction Plan which has still to be endorsed by the Municipal council. So the Lead Nepal team shared the DWM guideline for AP document and requested to incorporation of the Disaster waste management concept and building the capacity of municipality technically with human resources.
- The machinery owned by the Gaur Municipality for dealing with disaster events and waste management include: 1 JCB (Dozer); 3 Tractors; 1 Fire fighter vehicle and one vehicle for faecal sludge collection and disposal.
- There was discussion with civil society members including politician and social activist who informed that few wards of Gaur Municipality were partially affected during 2017 flood in Southern Tarai affecting several other municipalities in the district of Rautahat. As there are two rivers named Bagmati River in the East and Lal Bakiya in West

### **Birgunj Municipality:**

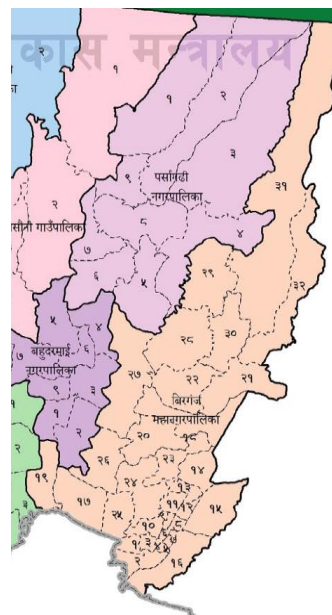
Birgunj Metropolitan is located in the Parsa district in the Province #2 currently situated near to India boarder. Metropolitan is one of the old settlements having the population of 240,922 distributed in 32 wards covering 9132.071.97 Sq Km. The type of the houses varies from traditional mud brick wall with tile in the outer suburban area with the strong RCC structure in the core city area. It has been observed rapid urbanization. The river passes on east and west side of the Metropolitan which occasionally floods, the metropolitan has experienced floods in past. But metropolitan did not experience severe flood damage. Disaster events experience are generally fire, windstorm and flood

### **Officer contacted:**

- Mr. Prakash Amatya (retired Planning officer) Birgunj Metropolitan City
- Mr. Binayak Raj Pandey, Environment Officer Birgunj Metropolitan City

### **Key point discussed and information collection:**

- Part of the metropolitan is subjected to flood near by the river area, but so far very serious flood damage is not reported
- The officials of Metropolitan are not aware about the Disaster waste management concept.
- There are events of disaster and accident happens in the metropolitan area, which includes: fire, accident, windstorm, flood. So far there is not big disaster event like Earthquake reported.

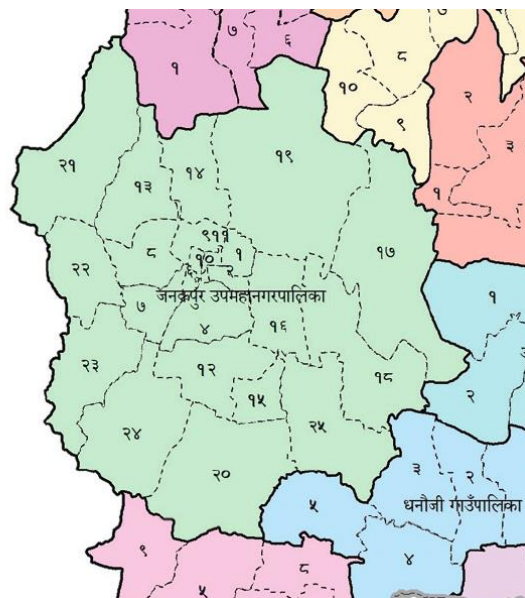


- The official admitted that there are issues about the disaster waste management. But the small events of disaster like fire, which occurs occasionally, produced wastes are managed and most of the scraps metal are sold in the scavenger market.
- It was reported that a feasibility study of potential of waste to Energy in the metropolitan with the support from the AEPC was conducted in which some baseline information was collected about the properties of waste generation from the metropolitan.
- Metropolitan do not have landfill site. The Municipal wastes are dumped into the Sirsiya river not far from the Nepal- India Border area. The Indian side settlement people and administration regularly complained about the water quality of waster of the river.

### Janakpur Sub-Metropolitan City

Janakpur Sub Metropolitan is located in the Dhanusha district in the Terai region of Province #2 and currently the Capital of the province situated near to India boarder 23 km south of East-West Highway.

Janakpur Sub Metropolitan is a very old religious settlement having the population of 159,468 distributed in 25 wards covering 91.97 Sq Km. The type of the houses varies from traditional mud brick wall with tile in the out skirt with the strong RCC structure in the core city area. It has been observed rapid urbanization and with the widening of road which resulted several houses to demolish its part of house yielding construction debris. Most of the district it located and part of outer sub metropolitan city experience flood of 2017. But sub metropolitan did not experience severe flood damage. Disaster event experienced are fire, windstorm, and flood



### Key Point discussed:

- Sub-metropolitan has limited human resources capacity to address the day to day waste management in the city. It was also informed that they have very few vehicles to transport the waste. The office owns two JCB dozer.
- Not aware about the disaster waste management and appreciated providing knowledge about the disaster waste management during the disaster event where the responsibility to clearing the waste comes under the sub-metropolitan office.
- Officer also informed that the city roads are under expansion in which several houses are demolished beside the road side is producing huge amount of construction waste. So far these construction waste as used to fill the road connecting Janakpur and Dhalkebar and other feeder roads
- Officer informed there was not much effect to the Janakpur core during the 2017 flood, but the districts other parts were affected severely due to inundation. It was informed the disaster waste generated was mostly bamboo walls, tiles and brick which was easily reused by the villagers.



- The officer informed about the occurrence of windstorm few days back which had moved and fallen trees on the road blocking the traffic. The metropolitan had the responsibility to take out the tree and its waste.
- The officer informed that the sub metropolitan office don't have landfill for the waste deposition. So, it is throwing the waste in some allocated land temporarily and in nearby river bank



Figure 29: Snapshot of the tornado effects and DWM status of the affected districts

#### 2.2.4.5. Baseline survey in the 21 municipalities of Nepal

The 42 surveyors were selected from the Tribhuvan University to collect data from 21 municipalities across the seven provinces of Nepal. The surveyors were provided the structured questionnaire including all aspects of DWM. The collected information then cleaned and analysed and archived for the report writing.

#### 2.2.5. Baseline Assessment Report on DWM of Nepal

Based on the collected information, consultant prepared a draft report on Disaster Waste Management. LEAD Nepal submitted the draft report to UNEP IETC for their comment. First round of comments and suggestions were received. Consultant along with team leader is working on it to finalize the report.

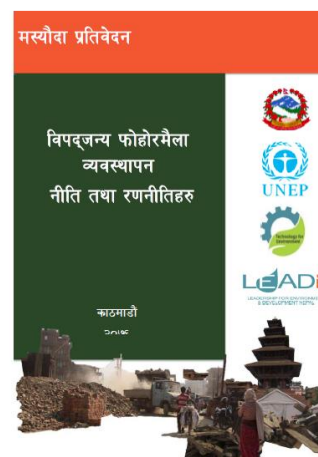
Disaster Waste Management Baseline study



15 May 2019

### 2.2.6. National Policy, Strategy and Action Plan on DWM of Nepal

LEAD Nepal and MoFAGA sat together for the modality of the national policy, strategy and action plan of DWM. MoFAGA formed the task group to review and add the components of the DWM into the strategy and frame the policy and strategy into the government format. The LEAD Nepal drafted a policy and strategy and submitted to the MoFAGA for necessary correction and review.



### 2.2.7. Pilot Demonstration Project in Lalitpur Metropolitan City

Lalitpur Metropolitan City (LMC) was the partner of LEAD Nepal. Lalitpur was the most affected city by the devastated Gorkha earthquake 2015. So that Khokana Ward number 21 of LMC was chosen to demonstrate a disaster recycling unit. To legally bind the work LEAD Nepal and Ward Number 21, LMC, Khokana signed a MoU on February with the witness of UNEP IETC focal person Mahesh Pradhan.

To proceed the work, LEAD Nepal procured a part time Staff as a Field Coordinator to look after all the affairs associated with this component and reporting the progress to team leader.

In this reporting period, several meetings were conducted and field visit was scheduled along with local political leaders, experts and community people. With the continuous positive support from LMC and community people and political leaders LEAD Nepal was able to search a potential vacant land for establishment of Material Recovery Centre for disaster waste.


With the help of experts, the potential technology for Disaster waste recycling was assessed and discussed with LMC. After that, quotation was called to purchase the equipment for recycling of disaster waste in Khokana. To make the system sustainable, LEAD Nepal further signed a tripartite agreement among the LEAD Nepal, Ward 21 of LMC and Eco Tech Private Limited, Lalitpur. The agreement was basically to include private company to establish the DW recycling unit. Along with this, LEAD Nepal conducted several meetings with private sector, LMC and community people to drag out the element how can the project be sustainable in long run.

Based on the formal and informal consultation, discussions and meeting with different stakeholders, LEAD Nepal drafted a business model of Material Recovery Facility and shared it to the UNEP IETC for comments and suggestions. LEAD Nepal is looking forward to the comments and suggestions from UNEP IETC.

### 2.2.8. Communication and Outreach

Subha Media drafted a concept note and circulated for comment. LEAD Nepal together with MoFAGA reviewed the concept note and provided comments. Based on the concept note Subha Media prepared a script with the theme of youth and waste management including integrated waste management along with disaster waste management issues of our society. LEAD Nepal and MoFAGA reviewed the script and provided them the comments. Mr. Mahesh Pradhan from UNEP IETC also reviewed it and provided his idea. After approval of the script, media house selected actors and started their work. They worked hard for a month and came up with a movie. Subha Media along with Team leader and Programme Manager worked hard to edit the movie. Finally, movie was launched on the 10 June 2019 in World Environment Celebration Day in Russian Centre for Science and Culture.

The Shubha Media jointly with LEAD Nepal also prepared a concept note on the 20 minutes documentary on integrated waste management of Nepal. LEAD Nepal and MoFAGA reviewed and finalized the script. They worked for several months to collect footage from different parts of Nepal and different season.



Finally, documentary was launched on the 10 June 2019 in World Environment Celebration Day in Russian Centre for Science and Culture.

The audiences appreciated the visual effects of the documentary and movie and said this was the first time in Nepal and the visual effects is so powerful that individuals and institutes will definitely think twice before discard their waste.

The short movie and documentary can be viewed in the link below.

<https://www.youtube.com/watch?v=u5U-gn1xrgI&t=657s>

<https://www.youtube.com/watch?v=z7lgAq2fXeI&t=169s>

