

# GOVERNANCE AND WOMEN'S GROUP PARTICIPATION IN SOLID WASTE MANAGEMENT IN NEPAL

## A Case of Lalitpur Sub Metropolitan City



Nikita Sharma

Master of Philosophy, Specializing in Geography

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 NTNU

Norwegian University of  
Science and Technology



## Abstract

*Waste Management is one of the major challenges municipalities in developing countries are facing. Municipalities in developing countries lack financial resources, technology and skills required to handle the burgeoning problem of solid waste management. This raises the issue of finding solutions to the current problems and delivering quality services to the public while facing financial and technical challenges. This study acknowledges the solid waste management system in Lalitpur Sub Metropolitan City, Nepal. The objectives of this thesis were: to describe and explain the current waste management system; to find out how governance affect the management of solid waste and recommend future solutions for a sustainable waste management system in the municipality. This is done by exploring the involvement of women's group as a method of public participation in solid waste management.*

*The objectives for the study were addressed primarily through semi-structured interviews and discussions with various stakeholders along with participatory observations. The study analyzed the current solid waste management system and identified the strengths and the weaknesses of the system in the municipality.*

*The study identified that the current solid waste management system practiced in Lalitpur Sub Metropolitan is highly inefficient. Waste segregation is inadequate. The collection and transportation of waste is challenged by inadequacy of resources. Recycling and composting is done in comparatively small scale. Majority of the waste is dumped in landfill site which faces a number of challenges due to weak governance practices. In order to deal with the current situation, the municipality has promoted capacity building and participation of women's group. This seems to be producing positive outcomes, though at small scale. Taking into consideration all the current issues the study makes some recommendations for developing a sustainable solid waste management system for the future. Some of these recommendations are public private partnership for improved solid waste management in the municipality, involving people for consultation with respect to solid waste management decision making process, adoption of integrated solid waste management system and most importantly improved governance and better performing public*

*institutions. The study concludes that people especially women's group are willing to participate and contribute towards the development of a sustainable solid waste management system. Recommendations provided by the study can be helpful to develop a system of solid waste management that can act as a model for other municipalities in the country.*

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## Abbreviations

ADB	Asian Development Bank
APM	All Party Mechanism
CBO	Community Based Organization
CDS	Community Development Section
CEO	Chief Executive Officer
DDC	District Development Committee
EU	European Union
FGD	Focus Group Discussion
GON	Government of Nepal
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH
IWW	Informal Waste Workers
KMC	Kathmandu Metropolitan City
LB	Local Bodies
LDO	Local Development Officer
LSGA	Local Self Governance Act
LSMC	Lalitpur Sub-Metropolitan City
MCPM	Minimum Conditions and Performance Measure
MOFALD	Ministry of Federal Affairs and Local Development
MOUD	Ministry of Urban Development
MSWM	Municipal Solid Waste Management
MT	Metric Ton
NEPCEMAC	Nepal Pollution Control and Environment Management Center
NGO	Non-Government Organization
NIMBY	Not in my Backyard
NPR	Nepalese Rupee
NTNU	Norwegian University of Science and Technology
OBA	Output Based Aid
SWM	Solid Waste Management

SWMRMC	Solid Waste Management Resource Mobilization Center
SWMTSC	Solid Waste Management Technical Support Centre
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
VDC	Village Development Committee
WEPCO	Women Environment Preservation Committee

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# 1. Introduction

This chapter serves as the general introduction, highlighting the issues of Solid Waste Management in developing countries. Research objectives and research questions also form a part of this chapter.

## 1.1 Background Overview

One of the current challenges in many urban areas of the world, both in mega cities and in smaller villages, is considered to be municipal solid waste management (Habitat,2014). Due to natural population growth, increasing urbanization, industrialization and limited resources the issue of waste management has become more challenging to cities in developing countries.

Today 54 percent of the world population live in urban areas, which is expected to be 66 percent by 2050(Nations,2014). Urban population around the globe is projected to grow by 2.5 billion urban dwellers between 2014 and 2050, with nearly 90 per cent of the increase concentrated in Asia and Africa (Nations,2014). However, urbanization itself is not necessarily a problem but unplanned and haphazard urbanization coupled with increased industrial and economic activities giving a rise to the living standard of people, in turn generating a larger amount of waste is an issue. This trend of rising population generates larger amount of waste creating a risk for both public health and environment(WHO,1998). The problem of solid waste is more visible in the urban areas due to the concentration of industries, changed consumption habits of the residents and inadequate finance and facilities to sustainable waste management(Dongballe,2016). The volume of solid waste generated in urban areas have gone beyond the capacity of the available facilities in most developing countries.

Solid waste generation and its impact is an emerging public health issue in developing countries (Rakib, Rahman, Ali, Akther, Huda and Bhuiyan,2014). In a developing country, the problems associated with solid waste management is more severe than in a developed country (Guerrero, Maas and Hogland,2013). According to a United Nations Development Program survey of 151 mayors of cities from around the world, the second most serious problem that city dwellers face (after unemployment) is insufficient solid waste disposal (Singh and Chari,2010). As United

Nations Environment Program in its report on solid waste situation in African sub-continent states in most developing countries solid waste sector is largely characterized by low coverage of solid waste management services, pollution from uncontrolled dumping of waste, inefficient public services, chaotic or unregulated private sector participation, and lack of key solid waste management infrastructure (UNEP, 2000) as cited in (Zurbrügg,2002).

The problem of municipal solid waste management is more acute in developing countries than in developed countries due to issues like unplanned settlement, lack of awareness, insufficient resources and lag of technological know-how (Marshall and Farahbakhsh,2013). Most cities cope with unprecedented challenges of managing solid waste along with the problem of collection and proper disposal (Sankoh and Yan, 2013).

It is also important to note the presence of higher amount of organic biodegradable component in municipal solid waste in developing countries. This high presence of organic component has an adverse impact on public health as well as on the environment (Alam and Ahmade, 2013). The organic matter present in the waste act as an attraction for the rodents and insects that transmit diseases and degrades the environment quality by producing foul odor and obstructing the beauty of the site (Alam and Ahmade, 2013). These impacts are not confined merely to the disposal site of the waste, they also infuse through the surrounding area including places where the waste was generated or accumulated(Zurbrugg,2003). Proper management of organic waste is necessary since its adverse impacts spread until they are fully decomposed (Zurbrugg, 2002).

Poor inaccessible and marginal urban areas in developing countries are the ones that suffer the most; situation in these low- income areas are worse than other parts they lack in services and infrastructure (Singh and Chari,2010). Waste collection system is often non-existent in these areas, especially because the settlements are unplanned and unauthorized and municipal services cannot reach in these settlements as they lack in basic infrastructure like well-paved roads.

In general, there are few constraints typical to developing countries that affects the sustainable solid waste management system. They are mostly concerned with the education awareness, resource availability and governance practices. Lack of education and awareness among the public

about sustainable waste management practices is one major limitation prevailing throughout developing countries around the world. One issue that researchers think should be taken care of in terms of effective waste management in developing countries is to improve public awareness and community participation in waste management. It is necessary to establish a sustainable waste management system and to promote environmental citizenship amongst community members (Yooda, Chirawurah and Adongo, 2014). Usually people are more likely to participate in sustainable waste management practices if they are aware about the potential consequences of improper waste disposal and when they are taught about the sustainable ways of waste management for example; recycling (Guererro, Maas and Hogland). Whereas in developing countries formal recycling programs are rare, so it is common for the informal sector carry out the recycling work (O'Connell, 2011).

In addition to the issue of increased solid waste generation, developing countries have to cope with problems such as lack of accessible road network through many sections of the city (Parrot, Sotamenou and Dia, 2009). With the increasing population increases, the congestion in urban areas as a result waste collection vehicles cannot reach inner city areas, allowing the waste or garbage to build up overtime, eventually leading to adverse effects on public health (Ngoc and Schnitzer, 2009).

On the other hand, authorities in developing countries have to face challenges such as increased cost for waste management, the cost of basic waste management in developing countries is high, usually 20-50 percent of recurring budget of municipalities (Shekdar, 2009). Although only half of the urban population is catered by the waste management services (Bravo, 2008). As Zerbock points out, lack of financial resources and infrastructure to deal with solid waste creates a vicious cycle; lack of resources leads to low quality of service provision which leads to fewer people willing to pay for the services, which in turn further erodes the resource base and so on (Zerbock, 2003).

With the increasing population, changing consumption pattern, economic growth, municipalities in developing countries are struggling to retain a sustainable solid waste management system (Ngoc and Schnitzer, 2009). Mostly solid waste generated in the urban areas of developing countries goes uncollected (Khajuria, Yamamoto and Morioka, 2010). The uncollected waste is

often dumped on the roads and streets as well as in drains, rivers that sometimes can contribute to problems like flooding due to blockage of drainage system. Whereas, it also contributes to breeding of insects and spreading of innumerable diseases that in turn affects the public health. Even the collected waste due to lack of proper waste management system is often disposed of in uncontrolled dumpsites or burned, polluting water resources and the air (Ejaz, Akhtar and Hashmi, 2010).

Every step in SWM system starting from the household waste generation, storage, waste segregation at source, adoption of recycling activities, minimization of littering, willingness to pay for the waste management services, and opposition to the siting of treatment and disposal facilities are highly dependent on public awareness and participation (Shahmoradi,2013). Therefore, in developing countries, public awareness and approach towards waste has significant impact on the success and failure of entire solid waste management system.

## 1.2 Research objectives and questions

The focus of the study is on municipal solid waste management at the household level. This study examines the role of governance in municipal solid waste management focusing on household level and women's group participation in waste management Lalitpur Sub Metropolitan as a case reflecting the situation in developing countries where a shift to alternative development concepts is seen. Municipal Solid waste management in Lalitpur Sub-Metropolitan is examined with respect to good governance indicators like public participation, co-operation, transparency and accountability, efficiency and equity. The relationship between public and private sector along with international and national aspects of governance are discussed, with the focus on participation of women's group as an alternative development approach. The reason to choose the following research questions is a growing focus in the waste management literature on governance as a key to improve the services, additionally involvement of community based organizations in Nepal has also been regarded as a method to make solid waste management services efficient.

### 1.2.1 Research objective

The objectives of the thesis are as follows:

- To describe the current waste management situation in the municipality including the practices and main challenges.
- To examine the role of good governance in the management of solid waste in the metropolitan city
- To understand how involvement of women's group as a method of public participation has produced intended results in solid waste management.
- To recommend future solutions and possibilities for a more sustainable waste management in the municipality.

### 1.2.2 Research Questions

1. What are the current solid waste management practices in the municipality?
2. What is the relationship between good governance and waste management in an urban area like municipality?
3. What are the main challenges faced by the municipality when it comes to managing solid waste?
4. Which role do women groups play in the management of solid waste at household level?
5. What should be done to improve the management of solid waste in the municipality?

### 1.2.3 Rationale of the study

The problem under investigation in this study is the worsening solid waste management situation in Lalitpur Sub Metropolitan City and the relationship between governance system and the functioning of the municipality. In addition, examining the role women's group play for the management of solid waste at household level. The municipality is predominantly urban settlement where solid waste generation is comparatively higher than other municipalities with the increased production and consumption habits. In contrast to the situation of increasing solid waste generation, municipality is unable to provide adequate solid waste collection, transportation and safe disposal facilities to the public. As a result of this solid waste situation in the municipality is deteriorating day by day. The role of governance is important to understand in this context as the country is facing political instability and public institutions are the ones directly affected by this, municipalities being one of those institutions. Similarly, the role of women's group becomes important for solid waste management as, the municipality is the only urban settlement with proper

functioning community based organizations in form of women's group contributing to solid waste management. Therefore, this study was undertaken to gain a better understanding of the current practices and challenges faced by the municipality and formulate recommendations for better solid waste management system.

#### 1.2.4 Scope of the study

The focus of this study is Lalitpur Sub-Metropolitan City (LSMC), one of the largest municipality in Nepal undergoing rapid urbanization along with the problem of proper solid waste management. The worsening waste management situation in municipalities of Nepal has attracted attention of national government as well as various international donor organizations. A number of studies have been carried out to understand the waste management situation in Kathmandu Valley which comprises Lalitpur Sub Metropolitan City(LSMC). However, none of these studies have examined the issue of solid waste management in detail to generate an adequate understanding and solutions to existing problems. Particularly no research has been done in relation to governance and solid waste management with a focus on women's group participation. Thus, solid waste management situation in LSMC is still under researched. In addition, the unavailability of authentic and reliable data has deepened the already existing knowledge gap. In this current scenario, the study has tried further understanding of the solid waste management situation in LSMC, with a focus on governance and considering the contribution of women's group. It has tried to make contributions to the theory and practice of solid waste management system in the municipality and Nepal in general.

#### 1.2.5 Organization of the thesis

The thesis is organized into 7 chapters. In chapter 1 introduction to the context of the research, background of the study, research questions, research objectives, statement of research problem and scope of the research are presented. Chapter 2 provides the literature review of the solid waste situation in developing countries, examining the factors hindering effective solid waste management in these countries. It also talks about the approaches that developing countries are

embracing for better waste management practices. Chapter 3 consists of the conceptual and theoretical framework used in the research, addresses the concept of governance, essentials of good governance, relationship between good governance and institutional qualities for better waste management services in developing countries. Chapter 4, covers the methodological approach employed and the methods used to collect data for the research. It is followed by a discussion of qualitative approach as a dominant paradigm in social science research. Various field experiences are discussed, along with the methods used for the study. Finally, issues relating to positionality, ethical issues and self-reflection as a researcher are discussed. Chapter 5, provides the background information of the study area, its geographical features, population, climate history of solid waste management in Nepal and legal provisions for waste management in Nepal. In Chapter 6, analysis of the data gathered for the study is done. It covers the analysis of waste generation, segregation, collection, transportation and disposal in LSMC. The analysis is done from the perspective of different stakeholders including the municipality, the private actors and the women's group. It also discusses the various issues raised by the different service providers and women's group in relation to the theory and various models are applied to analyze the information. The results presented later in the chapter is an attempt to answer the questions raised in Chapter 1. Chapter 7, comprises my own conclusion drawn from the study and recommendations for better solid waste management in the study area and Nepal in general.





## 2. Solid Waste Management in developing countries

Solid waste management condition in developing world is dismal. Today, Solid Waste Management System in developing countries are same as the conditions found in the past in developed world (McAllister, 2015). Traditionally, the municipalities have been in charge of providing SWM services in developing countries (Ogawa,2008). It is the responsibility of municipalities to organize and manage the waste from household; this includes providing the structure for the collection, transportation, treatment and disposal of waste in a proper manner. However, municipal governments of developing nations lack the ability to provide the basic waste management services (Guerrero, Maas andHogland,2013).

### 2.2Solid Waste Management Problem in Developing Countries

Waste management has been a problem for the government in developing countries. Mostly due to the combination of social, economic and political reasons. In Municipal Solid Waste Management (MSWM) of developing countries most common problem can be identified as inadequate coverage area of waste collection, operational inefficiencies of public services limited recycling activities, inadequate landfill disposal, and inadequate management of hazardous and hospital waste (Zurbrugg, 2003).

Poor solid waste management services in developing countries led to the implementation of neoliberal policies through structural adjustment programs (Manga, Forton and Read,2008). Later alternative development theories also promoted the participation of private actors for the provision of better services (Lewis and Kanji,2009). Despite the private sector involvement in solid waste management, there are still problems with solid waste management services in developing countries (Oduro-Kwarteng and VanDijk,2013). The problems in cities have become burdensome despite efforts being made by city authorities and governments (Oduro-Kwarteng, 2011). The problems of solid waste such as inadequate service coverage, irregular waste collection, waste spill over from bins and storage containers, and lax attitude of people towards indiscriminate disposal on unauthorized places and waste littering are common in developing countries (Oduro-Kwarteng, 2011).

Though in developing countries the amount of solid waste generated in most urbanized areas are low as compared to waste generated in industrialized countries, the municipal solid waste management system is inadequate. Primarily, inadequacy in solid waste management eventually leads to environmental pollution, impact on public health and disrupts the aesthetics of the city. As the public sector becomes unable to collect the waste, uncollected waste is often dumped into rivers or drains and sometimes burnt and buried. People do these activities without taking into account the environmental consequences and health risks it poses to them. These problems have an immediate effect on the health of poorer population while in the long run it affects the entire urban population. The impact of uncollected waste within cities in developing countries is enormous. Cities are faced with urban environmental health issues related to solid waste management (UN-HABITAT, 1996).

The amount of waste generated by a household largely depends on the family size and monthly income (Guerrero, Maas and Hogland,2013). At the same time consciousness among household about waste segregation and waste management depend on their level of knowledge and exposure. It is common for developing countries that collection, transfer and transport practices are affected by improper bin location, poor collection practices, route planning and lack of information about collection schedule, inadequate infrastructure, poor road network and insufficient number of vehicles for waste collection (Mogadham, Mokhtarani and Mokhtarani,2009).

In industrialized countries, solid waste generated from different sectors are treated in separate ways whereas in developing countries the separate treatment of waste is non-existent (Jin,Wang and Ran,2006). But there is a presence of informal sector in developing countries that contribute largely to waste minimization (Wilson, Velis and Cheeseman,2006). Organizing the informal sector and promoting micro-enterprises are also effective ways of extending affordable waste collection services (Sharholy, Ahmad, Mahmood and Trivedi,2008). On the other hand, lack of knowledge about treatment system among waste management authorities is stated as one factor affecting the proper treatment of waste (Chung and Lo, 2008). Whereas, for the disposal of household waste, reasons like inadequate supply of waste containers, longer distance to communal

containers increase the chances of waste being dumped in open areas and roadsides (Tadesse, Ruijs and Hagos,2008). Major constraints encountered by municipalities of developing countries are as follows:

#### 2.2.1 Inadequate human resources

Ogawa (2008) notes that developing countries lack in technical expertise required for solid waste management especially planning and operation, both at national and local level. He also argues that many solid waste management programs initiated by external donor agencies failed to sustain due to lack of technical expertise and unavailability of funds(Ogawa,2008). According to Onibokun (1999), most municipalities are unable to attract qualified personnel required for the various aspects of waste management such as planning, operation, monitoring and evaluation. In many cases, authorities have inadequate human resources at all levels, involving the laborers in waste management sector. This was pointed out by Kironde (1999) that human resources for waste management in Dares Salaam were inadequate in terms of both managerial and technical staff and waste collectors. He argued that the main reason behind this was poor technical training along with the low wage rate and dehumanized working conditions (Kironde,1999).

Along with it, shortage of people working in waste management sector in development countries can be related to social stigma associated with the waste (Onibokun, 1999). This situation leads to disrespect for waste and sanitation work and in turn induces low morale among waste laborers (Ogawa, 2002). This makes the poorly educated and the poorest population to take up the job in waste management. It makes the implementation of waste management programs difficult for the authorities unless they are able to train and motivate these human resources properly according to the requirement.

#### 2.2.2 Institutional Constraints

Inefficient institutions are responsible for poor urban management and public service delivery in developing countries (Zurbrugg,2002). It is characteristic of developing countries to involve several agencies in solid waste management system; often without clear distinction of roles and responsibilities of the various agencies(Ogawa,2008). While in some states the issue of not having an agency to manage and guide the activities of other waste management agencies also exist (Attahi, 1999). While existence of number agencies without well-defined roles can result in

duplication of one function (Ogawa, 2008). The lack of collaboration and co-operation between the agencies involved can lead to the failure of waste management program. Whereas, inefficiency in managerial skills of institutions can also be one of the reasons as noted by (Zurbrugg, 2002). Municipal administrations responsible for SWM services are usually weak in their functioning and bureaucracy is filled with hurdles.

Thus, to improve the management of solid waste in developing countries, an effective and efficient management is required. In addition, co-operation and co-ordination between different levels of government and different agencies involved in the urban waste management system is needed for sustainability in waste management.

### 2.2.3 Absence good governance and civil society

The last two decades, governance has been a major aspect of development discourse. Especially in poor developing countries where lack of good governance practices has been blamed for the inefficient delivery of public services in this case waste management services. Whereas lack of a strong and well-organized civil society to raise social issues and exert pressure on governments have always been felt in developing countries (Hashmi, 2007). The prevalence of “bad governance” for a long time has made governments in developing countries numb towards the wellbeing of the citizens and have failed to deliver services like provision of basic infrastructure, management of waste in order to maintain public health (Hashmi, 2007). The poor are the ones always hit hard by bad governance as they are in many cases, denied participation in decision making, especially about the issues that affect them. Thus, lack of participation of the poor in decision making process related to services such as water, sanitation and waste will lead to situation where there needs are unlikely to be met in future as well (Devas and Korboe, 2000).

According to Hashmi (2007), a strong civil society is necessary for the promotion of a vigorous liberal democratic order in the Third World, where governments are generally unaccountable and unresponsive to the problems of society (Hashmi, 2007). This view is supported by Cohen and Arato (1992) who also regard civil society as an important actor for the promotion of democracy and rights. According to the UNDP (2005), civil society action is critical for establishing strong safeguard policies and no government can achieve sustainable development without the active involvement of a fully-fledged civil society as cited in (Feinberg, Waisman and Zamosc, 2006). In

spite of the important role that civil society can play in promoting good governance and the general interest of society, civil society pressure or action is generally weak in developing countries and even non-existent in many areas as they fail to organize themselves and take action. While in some cases even when they complain about the poor services, it often goes unheard and unnoticed due to the inability of the poor to organize themselves as group (Smith,2007).

#### 2.2.4 Budgetary/Financial Constraints

Financial constraints are normally felt in developing countries, as resources are limited and available resources are usually unevenly distributed. Municipalities struggle to achieve their urban environment management goals due to financial constraint (Serageldin, Solloso and Valenzuela,2006). There are limited opportunities for the development of sustainable SWMS, as government budgets are limited and proper waste collection is overlooked (Al-Khatib, Monou, Zahra, Shaheen and Kassinos, 2010). A study in Kenya found that municipal budget was used to pay over-staffed and underqualified workforce (Henry, Yongsheng and Jun 2006). Whereas issues such as inadequate vehicles, waste collection equipment and waste collection laborers are common, mainly due to misappropriation of the budget.

Lohse (2003) has described the problem of finance in municipalities of developing countries as “the gap between financial resources and municipal expenditure needs” (Lohse,2003, p.4). According to him, this fiscal gap is widening as urban populations expand, increasing the demand for infrastructure and services including waste disposal. He further goes to explain that one reason for the municipal finance gap is that “most municipalities lack the autonomy to establish their tax basis, rate structures, and enforcement procedures, and so cannot raise revenues commensurate with their expenditure requirements” (Lohse, 2003, p .4). Whereas the low fees charged by the municipality for waste collection services and insufficient funds from central municipal budgets cannot finance adequate levels of service (Zurbruegg, 2002). While some authors have pointed out that, the finance problem in governments is due to the lack of good financial management and planning (Tagoe and Anuwa-Amarh, 2005). Low priority given to solid waste management is another reason for inadequate finances in developing countries which results in inability to provide the level of service required to protect the environment and public health (Ogawa, 2008).

Whereas, some municipalities as a solution to the financial problem, has raised revenue from other municipal infrastructure. Still issues like corruption, lack of transparency and accountability constrain in revenue raising activities in developing countries (Kolstad and Wiig,2009). On the other hand, lack of industrial growth in developing countries makes them highly reliant on donors to buy expensive equipment required for waste management (Driscoll,1995).

#### 2.2.5 Lack of advanced technology

In most developing countries, technologies adapted in municipal solid waste management are either inadequate or inefficient to the changing times (Guerrero, Hogland and Maas, 2013). Developing countries are not able to use the conventional waste collection vehicles as used in developed countries due to its high maintenance cost and lack of engineering capacity. At the same time, there is a presence of urban poor, in developing countries which makes the cheap. This cheap labor can be utilized by providing jobs in waste management sector so that the focus is on labor intensive methods. Nonetheless, inadequacy of technology and equipment contributes to the lag in service coverage and inefficiency in waste management. While in developing countries, some waste sources large part of the households in the city might be very difficult to access due to congested and poor roads (Bleck and Wettberg,2012). This is especially problematic in unplanned settlements such as slums or low-income areas and thus, the vehicles should be selected cautiously. A study done in India found that poor conditions of containers and inadequate maintenance and replacement of worn-out collection vehicles contributed to behaviors such as littering and illegal dumping by citizens who felt they could not properly dispose of trash because trash bins and waste services were not properly maintained (Hazra and Goel, 2009). On the other hand, techniques effective in developed countries might not always be useful and efficient in developing countries, as they do not have adequate infrastructure and know how to handle these technologies. Currently, the need of developing countries is to design and adapt appropriate waste management equipment suitable for the local condition (Marshall and Farahbakhsh, 2013).

#### 2.2.6 Inadequate enforcement of laws and regulations

In developing countries, the lack of laws and regulations is not a problem, rather lack of enforcement is an issue for sustainable waste management. In the report prepared for African Development Bank (ADB) on study of solid waste management options for Africa, Palczynski

noted that “no country [in the study] has a specific waste management legislation even though legislation is being drafted now in some countries” (Palczynski, p.iv). While in some countries although there are, sufficient legislations covering waste management, local authorities lack the capacity to implement them (Henry et al., 2006). It has been observed that in many developing countries laws related to waste management are not concrete but are part of legislations related to environment management. Onibokun (1999) has also noted the inability or unwillingness of municipal officials to enforce existing laws on environmental sanitation including the scanty legislation on waste disposal. Whereas, public in developing countries are reluctant to comply to waste management laws and rules due to lack of knowledge and awareness, which leads to activities such as littering and dumping of waste in rivers, drains and at roadside. Activities like this makes the process of waste management more difficult. Thus, inadequacy of appropriate legislation in some cases and lack of enforcement of existing laws in other makes solid waste management system in developing countries a difficult job.

## 2.2 Current Approach to Solid Waste Management in Developing Countries

Inadequacy in the waste management services has created a need to establish a sustainable waste management system that focuses on social, environmental, economic, financial and institutional aspects of developing countries (Guerrero, Maas and Hogland, 2013). There is an emerging global consensus to develop local level solutions and to involve community participation for better waste management (Rathi, 2007). In the current scenario when municipalities are, struggling to handle the increasing amount of waste generated in the urban areas emphasis on new initiatives in SWM can contribute to urban sustainable development mainly through the focus in governance and partnerships between various sectors.

With the increasing negative impact of uncollected waste on surrounding areas including the adverse impacts on public health indicate the need for public involvement in ensuring provision along with the possibility of contracting out the service to the responsible communities. While keeping in mind needs of the poor urban areas, lacking infrastructure and producing comparatively lower volume of waste is also important; as they might require the service directly from the municipality. Solid Waste Management in developing countries is a complex task due to the existence of population with diverse socio-economic status, which makes cooperation among

communities, private sector and government as a way of sustainable waste management. Especially involvement of women in household solid waste management programs can be considered important as they are the ones generally doing the household chores and are involved in cleaning the household.

As a result, focus has shifted on alternative development approaches in solid waste management programs that take into account country-specific problems; development and implementation of regulations and standards. Along with it, a system of enforcement of regulations have started to dominate the solid waste management system in developing countries. Local government or municipal governments have largely been responsible for solid waste management, complying with national regulations (Marshall and Farahbakhsh, 2013). The interplay of various institutional, financial and human factors requires the municipal government to involve public agencies and private organizations. These alternative approaches are people centered and participatory. It emphasizes that people are agents of social change and grass-root organizations and informal sectors can be an integral part of development process.



## 3 Conceptual and Theoretical Framework

### 3.1 Relevancy of the concept

The concept of governance, its principles and its indicators of institutional qualities gives an insight about how the governance system should be for the different sectors of the state to function effectively. In addition, the importance of involvement of grass-root level organizations/community based organizations as a method to achieve better governance is addressed by the concept. In reality, achieving good governance with all its elements in place may not be applicable to every country. However, in municipal solid waste management, the importance of these principles of governance such as transparency, accountability, participation etc, in relation with institutional qualities cannot be undermined as being one of the major factors contributing to the ineffective waste management system. Governance is used as a framework to understand the how the current waste management system is operating and what should be improved in the municipality to make the SWM more efficient. Furthermore, a descriptive understanding of institutional qualities has been useful in defining the role of actors involved in waste management system. In addition, it provides a better understanding of organizational operations and linkages concerning waste management in the municipality. Consequently, governance as a concept and theoretical framework has helped me to understand the struggle of municipality to provide services to the public due to financial, institutional, political reasons also the relationship between municipality and other actors such as the government ministries non-government organizations and Community Based Organizations operating within the waste management system.

### 3.2 Concept of Governance

The term “governance” came into prominence after World Bank in its study in 1989 “Sub-Saharan Africa: From Crisis to Sustainable Growth” identified the crisis of governance as an issue for economic development in Africa. Post-colonial African states especially the Sub-Saharan region has failed to achieve social, economic and political advancement for the ordinary people. However, while for those who run the state have continued to enjoy unrestrained access to state resources through a well-oiled patron client system, which has been stated as crisis of governance in state of

Africa (Animashaun, 2009). Since then, the term governance has become one of the most popular term in development discourse. Though its use became widespread, the way governance was perceived varied with nations. It generally refers to the task of running a government or any appropriate entity, such as an organization (Hyden, 1992).

Governance as defined by World Bank is the manner in which power is exercised in the management of country's economic and social resources for development (World Bank, 1992, p.1).

UNDP defines "governance" as the exercise of political, economic and administrative authority to manage a nation's affairs. It is the complex mechanisms, processes, relationships and institutions through which citizens and groups articulate their interests, exercise their rights and obligations and mediate their differences (UNDP, 1997).

This definition of governance makes a clear distinction that governance is broader than government as governance encompasses the state but also surpasses the state as it includes the private sector and civil society organizations (Smith, 2007). Governance may be taken as a significance of how people are ruled and how the affairs of a state are administered and regulated. It refers to a nation's system of politics, and how this functions in relation to public administration and law (Mollah, 2003).

Governance as a concept has been adopted in the development discourse since the 1990s to improve the resource management and public services in many developing countries characterized as poor, inefficient, corrupt in their public service delivery system. International development community has been promoting good governance as a key part of aid policies and development agendas (World Bank 1992, 1994; Leftwich, 1993).

Leftwich argues that international donors' interest in governance is due to four factors. First, the experience of structural adjustment in the 1980s reflects the significance of political factors such as political commitment and state capacity in policy design and implementation. Second, neo-liberalism, dominant in the Western ideological profile since the 1980s. This has led to the assumption that democracy is necessary for a free market economy and that economic growth failed in most Third World countries because of such political factors as authoritarian rule and

deficient democratic practices. Third, the collapse of communism in the late 1980s has enabled the west to impose the political conditionality of democratization on Third World countries. Without being afraid of losing allies or clients to communism, as it had been the case in the earlier bipolar world of the cold war. Finally, indigenous pro-democracy movements in many Third World countries legitimize the international donors' policies by supporting the political liberalization (Leftwich, 1993).

According to Rodriguez and Winchester in their study of urban governance in Latin America, referred governance as the pattern of formal and informal relationships between the agents that operate within and throughout a city and how these agents make urban development decisions (Rodriguez and Winchester, 1996). Their definition of governance includes the actors that function outside the realm of the state. This definition of governance aids the vital role that non-state actors play in governance as well as the informal relationships between the state and the actors.

In the 21<sup>st</sup> century, the term governance has been applied to many different areas and issues. Especially organizations like World Bank and European Union refer to the normative state of good governance when referring to governance (Davies, 2008). Governance is used interchangeably with good governance. The principles of good governance as put forward by World Bank are participation, transparent and accountability, rule of law, effectiveness and equity. Good governance ensures that political, social and economic priorities are based on broad consensus in society and that the voices of the poorest and the most vulnerable are heard in decision-making over the allocation of resources.

Good governance is epitomized by predictable, open and enlightened policymaking, a bureaucracy imbued with a professional ethos acting in furtherance of public good, the rule of law, transparent processes and a strong civil society participating in public affairs (World Bank, 1994).

While the critics of World Bank's definition argue, that World Bank has interpreted good governance as good neo-liberalism (Wood, 2005). Hirst states 'that good governance therefore means creating free markets, promoting investment and adopting the right macro-economic policies' (Hirst, 2000, p.14) as cited in (Pierre, 2000).

According to McCawley, the most important elements of good governance are; the processes by which governments are chosen, monitored and changed, the systems of interaction between the administration, the legislature, and the judiciary, the ability of government to create and to implement public policy and the mechanism by which citizens and groups define their interests and interact with institutions of authority and with each other (McCawley, 2005) as cited in (Roy, 2006).

Even though the concept of governance has been defined in different ways by different authors, the essence of the concept remains the same. In the broadest sense, governance concerns performance of the government, including public and private sectors, global and local arrangements, formal structures, informal norms and practices, and spontaneous and intentional system of control (Roy, 2006).

### 3.2.1 Good Governance and Bad Governance

Today governance is used as a standard way of referring to good and bad governance. International aid has identified bad governance as major obstacle to economic growth in poorer countries and as a result the presence of good governance in government policies has become a necessity for the developing countries receiving aid from the international donor agencies. It can also be seen in the priorities of the donors, which mainly includes promotion of democracy (elections, rule of law, accountability, human rights and economic liberalization).

A 1992 World Bank report identified the following key symptoms of bad governance as follows; failure to make a clear separation between what is public and what is private. Along with, a tendency to direct public resources for private gain, failure to establish a predictable framework of law; arbitrariness in the application of rules and laws. Excessive rules, regulations, licensing requirements, and so forth which impede the functioning of markets and encourage rent-seeking, priorities inconsistent with development, resulting in a misallocation of resources, excessively narrowly based or non-transparent decision making (as cited in Khan, 2002).

As Bøås has written, ‘the World Bank operationalized “bad governance” as personalization of power, lack of human rights, endemic corruption and un-elected and unaccountable governments’. Therefore, ‘good governance must be the natural opposite’ (Bøås, 1998).

In order to improve governance, significant amount of resources are spent to promote good governance in developing countries. The Worldwide governance indicators as put forward by World Bank in 1996, has been a method to measure governance across countries. These new set of the World Bank public sector governance indicators are covering 212 countries from the period 1996–2008. Currently this has been recognized as an effective measurement tool across the world. These governance indicators focus on the following 6 dimensions (Kaufmann, Kraay, and Mastruzzi, 2009):

- **Voice and Accountability:** measuring perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- **Political Stability and Absence of Violence:** measuring perceptions of the likelihood that the government would be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
- **Government Effectiveness:** measuring perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.
- **Regulatory Quality:** measuring perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
- **Rule of Law:** measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- **Control of Corruption:** measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ‘capture’ of the state by elites and private interests.

### 3.3 The main indicators of good governance

United Nations Development Program as a promoter of good governance in developing countries has given priority to indicators like participation, transparency, accountability, effectiveness and equity as the most important ones (Grindle, 2012). Major focus in this study will also be on the definition of good governance given by UNDP as they emphasize on sustainable development. The indicators defined below are chosen for the study as these are the ones that are able to represent the current situation in Nepal. Where political instability is all time high in combination with lack of accountability towards citizens. The public sector is embroiled in corruption resulting to low efficiency in services.

#### 3.3.1 Participation

Participation in general is deemed a positive thing for development. Participation became an essential component of mainstream development in the 1990s, it was regarded as a method to address the development ills, now has become a development orthodoxy. Participation can be defined as a process in which stakeholders are able to influence public policy decisions, have control over common resources and institutions including a check over the government power (Agere, 2000). In the context of governance, participation focus on empowerment of citizens, including women and addressing the interplay between the broad range of civil societies, actors and actions (Agere, 2000, p.9). It enables a situation where citizens can make positive demands from the government and even monitor their actions. It can occur at different levels such as grass root level through civic organizations, at national regional level through various forms of government and through the private sector.

Organizations such as UNDP stress how development requires a contribution from public participation through civil society organizations because governments cannot on their own fulfill all the tasks required for sustainable human development. This goal requires the active participation and partnership of citizens and their organizations (UNDP,1995, p.2) as cited in (Smith, 2007). While critics of participation argue that democratic processes such as public participation at times can lead to situations like political instability; as it will serve the interests of the more powerful group in the society; but the evidence from many developing countries

including Nepal (e.g. community forestry) shows it has not been true; rather socio-political unrests occur more often in dictatorships, concluding that participation foster the overall development process (UNDP, 2000). Studies have shown that participation works better under some conditions than others, especially when it is based on already existing local communal institutions and systems of collective management perhaps associated with kinship, traditional leadership or other traditions of rural co-operation (Smith, 2007).

Participation in management of service through community organizations have been found to improve performance by strengthening the accountability of providers to clients. As Downs, has stated through the example of Nicaragua where local government acted as an “articulate interface” between the organized local population and state agencies that generally have few resources. In Nicaragua, the relationship between local government and local people became a significant reason for the mobilization of the population for public health and literacy campaigns (Downs, 1987).

Participation has been on the donors list as concern for quality of governance but has failed to provide impressive results in several cases. Achievements by participation since the 1980 are less than hoped for. Especially, participation of the poorest seldom occurs, as the development agencies both governmental and non-governmental are not able to adopt participation as a philosophy, culture and working practice. This requires a change in the power structure that perpetuate poverty, which political elites are reluctant to do, unless they can use participation to manipulate the system and support their agenda (Smith, 2007).

### 3.3.2 Accountability

Participation relies on accountability of the governing body. The government, private sector and civil society organizations who serve as decision-makers are accountable to the public, as well as to institutional stakeholders. Accountability differs depending on the organizations and whether the decision is internal or external (Graham, Amos and Plumtre,2003). Greater accountability from the leaders and the capacity of the system to put forward the public demand can lead to more committed and effective application of policies and greater responses to crises. Accountability is one of the various processes of democracy, where citizen can demand for information from the government. It makes the public agencies and officials responsible for their decisions. The core

purpose of accountability is to assure that the public agents serve for public interest rather than their own. Accountability is required from the part of service providers as an assurance for the desired level of service and performance.

Accountability can be attained at two levels: macro-level accountability and micro-level accountability (Paul, 1992). Macro-level accountability refers to the system in which ministers are accountable to the legislative body and public servants are accountable to the government. World Bank has identified it has two main aspects: financial accountability and economic accountability. Financial accountability is concerned about the government accounting system, mainly with the issues of functionality and checks the presence of an external audit system so that the expenditure is effective and corruption is under control. Whereas it also ensures that there are mechanisms to act upon the results of audit and perform follow-up action for any problem identified (World Bank, 1992). While, on the other hand economic accountability is associated with monitoring and evaluation of government's use of resources.

Macro -level accountability is usually concerned with providing complete and timely information to the public; micro-level accountability refers to the willingness and ability of the public to demand for or consider other option when dissatisfied with a public service (Paul,1992). It also depends on their access to alternative of public services Policies and mechanisms that endorse competition like deregulation, contracting out of services to different private service providers and public-private or public-public competition enhances search.

### 3.3.3 Transparency

Transparency is defined as a process in which government officials, civil servants, organizations, private companies, civil society organizations are open, act visibly, and are clear in their disclosure of plans and processes (Transparency Initiative, 2013). Transparency deals with the provision of appropriate and dependable information to the public. Transparency by the government in decision-making process and in implementation process is necessary to control corruption among public officials. On the other hand, transparency supports accountability as it emphasizes the optimum use of resources, promotes public participation and reduces the likelihood of uncertainty. To achieve the goal of transparent government there is a need of independent judicial system that



include a free, responsible press and a dynamic civil society. A transparent government makes it easier for the public and civil society organizations to scrutinize the government decisions positively and provide feedbacks for better performance in future. At the same time, adapting the concept of transparency in the administrative process requires a significant amount of resources especially for developing countries; this in turn may slow down an already struggling governance. Whereas it can become more advantageous to the influential, group of the society and serve their interest than of the public. While transparency has its limits as well, issues related to national security along with issues related to privacy of citizens cannot be made transparent. Transparency with its limitations serve as an integral aspect of good governance.

#### 3.3.4 Rule of Law

Rule of law is an essential aspect of good governance. The basic idea of rule of law is government exercises its authority legitimately as per the laws, rules and regulations while safeguarding the rights of its citizens. Rule of law was popularized by Dicey (1973), but he didn't give a concrete definition of rule of law, rather explained rule of law by three core principles; absence of arbitrary power, equality before law and protection of rights. Absence of arbitrary power is a condition where nobody has right to abuse/ misuse power(Mollah,n.d.). Similarly, no one can be punished except for breaking the law when proved by the court. Equality before law, where no one is above the law, before the law everybody is same, irrespective of his or her social, political and economic status. Protection of rights implies that the judicial system of the state is capable of protecting the rights of its citizens(Mollah,n.d.). Dicey's explanation of rule of law gives importance to equality between ruled and the ruler in front of law, leaves no room for abuse and misuse of power and prioritizes protecting citizen's rights. Thus, it promotes accountability in one hand and ensures individual rights on the other hand (Dicey, 1973) as cited in (Mollah and Hossain, 2014).

When discussing the concept of good governance, understanding decentralization is also necessary since it is a crucial factor contributing to better governing practices.

#### 3.3.5 Decentralization

Decentralization refers to transfer of power from central government to lower level government in a political, administrative and regional hierarchy (Agrawal,1999; Ribot,2002). This transfer of power can be of two form; Administrative decentralization commonly known as deconcentrating

which refers to transfer of power to lower-level central government authorities or to local authorities upwardly accountable to central government (Ribot, 2002). While, political, or democratic, decentralization refers to the transfer of authority and power to representative and downwardly accountable actors, such as elected local governments (Larson, 2005). The term decentralization is used to cover a broad range of transfers of the locus of decision making from central governments to regional, municipal or local governments” (Sayer, Elliot, Barrow, Gretzinger, Maginnis, Mcshane and Shepherd, 2005, p.124).

Researchers like Robert Charlick explain the relationship between governance and decentralization as a way of the state providing multiple centers of participation in decision-making that in turn assures better management, responsiveness, and accountability which are basic features of good governance (Charlick, 1992) as cited in (Nyiri, 2006). Decentralization plays a vital role for good governance but it is also important to note that decentralization only works when decision makers are able to implement it in its truest sense. According to VanSant decentralization itself is no guarantee of good governance nor of access of basic services to citizens, especially the poor, along with it decentralization is more than administrative and financial power sharing; it is also sharing of political power that enhances the civil society (VanSant, 1997).

While Vengroff and Ben Salem also point out that numerous countries have undertaken so-called decentralization programs but few have demonstrated the political will necessary for successful implementation (Vengroff and Salem, 1992) as cited in (Nyiri, 2006). Thus, actual decentralization takes place when all decentralized units are able to take part in actual decision making process to a certain degree as unplanned decentralization will lead to more bureaucracy (Smith, 2001). However according to ADB (2002, p.23) decentralization is described as an excellent way to dealing with solid waste management issues.

### 3.3.6 Efficiency and Effectiveness

Effectiveness and Efficiency is concerned with institutions that meet the needs and demands while using making the best use of resources. It is an essential component of good governance. Establishment of an effective and efficient governance system can help in solving the issues

detering development. Delivery of effective and efficient public service can help to enhance the governance as well as to reduce corruption in developing countries. When the government or the private sector can provide services to the public efficiently, it helps in controlling corruption as well. As public no longer will have to pay bribes to get their work done by the public officials. The concept of efficiency also entails the sustainable use of available resources to produce the desired results.

Thus, the main aim of good governance is to deliver to the needs of the citizens. It works toward protecting the citizens' fundamental rights while striving to build a sustainable society. There is also a need to identify the context in which the principles/elements of good governance are applied to. An element of good governance that may be regarded critical one country may not be given the same importance in another. There is no 'one size fits all' approach to governance, there can be common elements of good governance but every state has specific way of how it should be governed. All the indicators discussed above are related to each other. Lack of transparency and accountability and rule of law in the government and public sector leads to lack of trust among public; this will lead to decreased or no participation (Johnston,2006). Ultimately, leading to low level of efficiency and effectiveness in services.

### 3.4 Importance of Institutional Qualities in attaining Good Governance

Institutional qualities and governance principles as forwarded by UNDP is used as a mechanism to show the linkage or the mutually supportive nature between these two concept. As they depict the present solid waste management situation, where municipality as a public service institution holds the upper hand in waste management while private organizations and community-based organizations are also contributing from their side in solid waste management. The concept becomes relevant in the context of Nepal as the country is suffering from weak governance practices due to reasons like constant government changes, uncertain local elections and high dependency on donors and aid for resources. This is applicable and relevant in the waste management system of the targeted municipality as well.

A well-functioning governance system with the ability to formulate and implement policy measures best suited for the state is critical for the overall sustainable progress of the state

(Reindermann, Tedika and Christiansen, 2015). On the other hand, there is a need of institutions and organizations that have specific technical capacities and administrative qualities to support the government in the decision-making process and in building consensus among key stakeholders in the governance structure. These governance principles along with the institutional qualities are essential for developing countries as it can help in implementing effective and equitable policy measures (Johnston, 2006). This can eventually help in mitigating the factors delaying anticipated level of human development.

These institutional qualities are performance, adaptability and stability as noted by UNDP in its report in 2011; the main governance principles are participation, accountability, transparency, rule of law, efficiency and effectiveness (Gisselquist, 2012). When government institutions, private organization or the entire system adopt a combination of these elements of governance and institutional capacities, they can enhance their ability to formulate and implement effective measures to fulfill the needs of their citizens. These qualities and principles are mutually supportive: the governance principles set the overall enabling environment and drive the capacity of institutions to perform better and respond to crises, while the key institutions involved in realizing these principles need to be effective, adapt to changing circumstances and priorities, and sustain results and efforts (UNDP, 2011, p.3.).

These key institutional qualities and basic elements of governance, when adopted by core country institutions, can help countries design and implement policies that are more inclusive and help in maintaining the social system (Sepulveda, 2011).

It is a difficult job to determine which policy suits better for improving the governance structure and institutional capacities of the state. Thus, it is important to know the level of development in order to make investments in developing institutional capacities. In the absence of institutional capacities and effective governance many developing countries have relied on ad hoc, short-term measures to produce results from development programs. They would perform and produce better results if investments are done in building their institutions, which includes public service organizations and private organizations. This can help the state to sustain their development,

irrespective of their political background. Investment in developing an efficient and effective core structure and system is inevitable for sustainable development.

The qualities mentioned earlier are the ones responsible for the day-to-day functioning of the state. These institutions are public service organizations of government including government ministries and agencies, local level government and other organizations of states, responsible for public services. These institutions are responsible for the design and implementation of policies, and the administration of state activities. While institutional performance is the foundation of state capacity to function, and fulfil its obligations towards its citizens. Performance itself is not sufficient condition for countries that are prone to political instability and vulnerable to shocks like natural disasters or economic crisis; they also require institutions that are stable and adaptable.

#### 3.4.1 Performance

Performance of institutions that deliver basic public services and are a part of formulation and implementation of policies are important to countries, especially for developing countries that strive to achieve their development goals. Measured by effectiveness and efficiency, institutional performance is the foundation of the state's capacity to manage its executive, legislative and judiciary functions, to administer the economy, to deliver social services, to use natural resources sustainably, to ensure protection of human, economic and social, civil and political rights, and to provide security (UNDP, 2011). Effectiveness in simple term refers the degree to which an institution's objectives are achieved. It also includes how institutions are able to influence people and help them develop capacities in particular areas. Efficiency on the other hand is the ratio of outputs to the resources used to produce them (Resilience,2011). In simple terms, it is what the institution is able to achieve with the resources (financial, human) in the given period. The effects of improved efficiency extend beyond obvious cost-saving factors, and recent research shows a direct relationship between public sector operational efficiency and economic growth (Curristine, Joumard and Lonti, 2007). In addition, a government with an efficient public sector is more popular and acceptable among its citizens.

### 3.4.2 Adaptability

Adaptability as defined by UNDP is an ability to perform in conditions that may not be desired but exists due to a number of reasons like political /economic situation and institutions have to innovate to meet future needs (Resilience,2011). Institutions with adaptability as their core quality are always flexible and are continuously investing in their improvement; at the same time, ready to cope with shocks with innovative ideas and solutions (UNDP, 2009). States that are politically volatile need such institutions as they form a foundation for resilience(Resilience,2011) Especially in times of crisis countries need states that can adapt to the changing needs and priorities with time. These institutions should be able to adapt to changes in external and internal environment and carry out its activities accordingly.

### 3.4.3 Stability

Stability is the degree to which an institution can decrease volatility of performance through institutionalization of good practices and norms and can identify and mitigate internal and external risks through risk management (UNDP, 2009). Stable institutions are less volatile and more predictable about their performance. They make the most out of the available resources through the establishment of good working practices and groundbreaking standards. A stable institution should be able to design and implement proper risk identification, analysis and management (UNDP, 2009). An institution with a fully developed plan for day-to-day functions along with a strategy to address risks and shocks ensure stability. The figure below illustrates the linkage between elements of governance and institutional qualities.

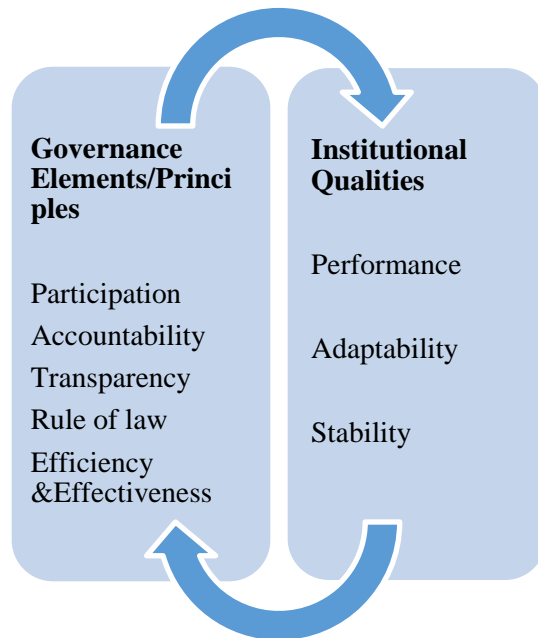


Figure 1: Linkage between governance and institutional qualities

(UNDP,2011)

#### 3.4.4 Linkage Between Elements of Governance and institutional qualities

The principles of governance discussed here, helps in creating the environment that allows the public as well as private institutions to perform, adapt and continue to be stable.

When the state institutions are accountable for their actions, decisions and outcome of their actions, it makes them more effective and efficient towards addressing the needs and demands of its people by improving their performance. Similarly, when institutions promote participation by involving the stakeholders in the decision-making process, its helps to make them more legitimate and their decisions more widely accepted.it becomes necessary for institutions in developing countries, as they have to adapt to conditions like resource scarcity, social and political instability.

While on the other hand, institutions with these governance principles embedded in them require performing, be stable and increase adaptability. This means that public service institutions should ensure participation in policy design, accountability, transparency, rule of law so that they are able to perform well, be stable and adaptable to respond to the changing needs of their beneficiaries.

The interrelationship between these governance principles and institutional qualities was developed for countries dealing with crisis but it is valid in any development situation. Nevertheless, these linkages between institutional qualities and governance principles seem to be particularly important to ensure governments' response in countries dealing with resource scarcity, social, political and economic instabilities.

This linkage between the institutional qualities and governance elements will be used to analyze the current solid waste management situation in Lalitpur Sub-Metropolitan City while discussing the role of women's group in management of solid waste management.

### 3.5 What is good enough governance?

The concept of good governance is contested, prevailing definitions of good governance focus on the necessity of good governance for development. But it is also important to understand that governance is not about ends and means; it is an intricate process in which the way things are done are as important as their outcome (Ayeni, 2000). It is necessary to keep in mind that; is the prevailing perspective of good governance with the focus on liberal democratic rule, free market relevant to the context it is being applied to. Over the years, the concept of good governance has been made to fit as per donor's needs and demands rather than receivers' necessity.

The different definitions of good governance have provided several indicators of good governance. These indicators range from transparency, accountability to lack of violence, crime and terrorism, but their use in measuring actual development may vary according to the context (Transparency International, Accessed February,2016). Developing countries might adopt the good governance concept as prescribed by the donors but sometimes it might not generate the expected results. It becomes important for developing countries to adopt reform programs based on their internal capacities to attain sustainable development rather than just adopting program/practices to attain external legitimacy. Moreover, Good governance has failed to provide answers to states that have to work with limited resources both human and financial, time, knowledge, and human and organizational capacity, in order for them to move towards better governance (Grindle, 2011).



As noted by Grindle, China and Vietnam are common examples of countries that have attained economic development and poverty reduction in the presence of many characteristics of bad governance (Quian, 2003) as cited by (Grindle, 2011). In Africa, Rwanda is another country that has made significant economic growth, improved public sector management and regulatory reform since genocide in 1994, but with respect to democracy, civil rights and political rights the situation is deteriorating. Some researchers on the other hand argue that, development can be initiated by small but significant changes in the approach and in long term state institutions are responsible to maintain sustainability (Rodrik, 2003). Good governance, its characteristics along with the conditions of institutions, policies, strategies and services as forwarded by the international institutions are ideal conditions. These conditions might not be achievable for all states. States have different social, political and cultural set-up which directly affects how concepts are adopted and implemented. In this situation, good enough governance can be a more attainable and realistic for recipient countries. (Grindle, 2011). It is a condition in which the government is performing nominally well and the level of civil society involvement is also minimally acceptable (Grindle, 2004). At the same time, political and economic development is not hindered by these conditions. Where states can focus on what is working for them rather than striving for something that is inescapably long and promoted by others. Overtime good enough governance will lead to improved performance through strategies and policies that are more feasible and country specific.

### 3.6 Governance in Waste Management

In developing countries one major arena where authorities have appeared to have failed to fulfil their duties is in solid waste management. One can say that the waste situation in a city is a good indicator of governance. If the city is clean, most likely refer to good governance but if the city is dirty often refers to as bad governance. Good solid waste governance involves ability of the authorities to implement the laws and regulations related to waste management and measure their success and failure to deal with waste issue. Effective and efficient service delivery largely depends on elements like accountability, transparency, participation and implementation of rule of law. In the process of dealing with issue of governance and urban waste management, consideration of formal structures of government along with the informal structures such as community based organizations/associations, their relationship with each other; and the relationship between the formal and informal structures involved in collection, transportation, and

disposal of waste carries utter importance. As governance involves different actors and institution, relationship between these actors largely determines the urban context. In case of solid waste management in urban areas of developing countries implementation of good governance in its true sense can lead to the institutionalization of policies, programs, rules and regulations for better urban management that help to eliminate problems posed by haphazard urbanization, changing social and environmental conditions.

### 3.7 Civil Society and Waste Management

In most cases, the responsibility for SWM remains within the municipality. With emphasis on good governance in management of public services t responsibilities can also be delegated to private sector, non-governmental organizations (NGOs), community-based organization (CBOs), and the informal sector as they contribute largely to urban economy. Involvement of grass-root actors in waste management system not only makes them responsible but also increases the possibility of better governance and reduces the burden municipality faces in developing countries. The shift towards civil society organizations for better governance gives rise to a different approach to governance “society centered approach” rather than age old “state centered approach” (Pierre, 2000). The society centered approach focuses on the role of civil society as an integral part of governing process that can propel social change. This approach to governance does not confine itself but aims to involve diverse social actors in order to achieve the collective goal of effective public service delivery.

More widely, this perspective refers to the notion of multilevel governance (Eckerberg and Joas, 2004) as cited in (Allen, Hoffmann and Griffiths, 2008) in which the management and governing of environmental services and infrastructure seems to be moving away from national governments as central actors to a more complex and highly diverse network of agencies. The roles and responsibilities are generally shared between the different actors involved. This does not by any means imply that the state has become obsolete or redundant but rather that its current role in the provision of public services has been willingly and unwillingly transformed (Allen, Hoffmann and Griffiths, 2008).

SWM systems in developing countries are complex as many actors are involved in the processes (Marshall and Farah bakhsh, 2013). Therefore, a clear and well-defined institutional framework becomes a necessity; especially a system in which there are clear distinctions between the roles and responsibilities of different actors involved in the process. It is widely accepted that a successful solid waste management system in urban centers cannot be achieved by the state alone (Marshall and Farah bakhsh, 2013). In such condition, governance and partnership with non-state actors offer a useful framework to understand how various actors collaborate in order to deliver a collective service to the population (Linder and Rosenau, 2000). Partnership has emerged as a concept applied in many developing countries where public services are beyond reach for the larger part of the population. The United Nations Development Program (UNDP) also believes that partnerships increase access of the urban poor to basic services (solid waste management) through the NGO and CBO participation, and eventually can lead to sustainable development (Ghina, 2003).

In general, the collaboration between government authorities and NGOs/CBOs in developing countries is in a need of formalization and institutionalization. The existing framework is not conducive to enhance collaborative work, provides NGOs and CBOs no formalized role/responsibilities. In order for the NGOs/CBOs to perform in their full potential clear distinction/ division of their roles and responsibilities is required (Tukahirwa, Mol and Osterveer, 2010). Hence, to improve the public service delivery, formalization of the collaboration between the different actors is important; also in order to avoid future conflicts.



## 4 Research Methodology

This chapter describes the methodology followed in the process of conducting the study. It will also analyze the methodology followed along with the limitations posed by the methodology. At the end, issues of ethical considerations and positionality will be explained.

Research methodology is a systematic way to solve the research problem. The methodology of the study describes the research strategy and different steps followed in the research process to get the expected results according to research objectives. Research methodology is not just the research methods that we follow; it also involves our logic for using the method depending upon the context of our study (Kothari, 2004). In the study, qualitative research methods are used to achieve the research objectives.

Qualitative research, broadly defined, means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss and Corbin, 1990) and instead, the kind of research that produces findings arrived from real-world settings where the "phenomenon of interest unfold naturally" (Patton, 2002).

Qualitative research is a particular tradition in social science that fundamentally depends on observing people in their own domain and interacting with them in their own language on their own terms (Kirk and Miller, 1986). Qualitative methods were used for data collection, as my study focused on capturing, exploring the participants views and experiences about management of solid waste in the study area through governance perspective. The ability of qualitative research to provide elaborative descriptions of people's experience and understanding of the research issue makes it a priority while carrying out the research.

Qualitative research is emergent and process oriented; several aspects emerge during the study, which allows the researcher to "view social phenomenon holistically" (Creswell 2003, p. 182). However, Creswell (2003, p. 182) asserts that the "more complex, interactive and encompassing the narrative, the better the qualitative study".

Thus, the use of qualitative methods allowed me as a researcher to interpret the situation according to my understanding. As it is a preferred method for studies based on specific situations, contexts and people's action. It allowed the use of multiple methods, which provided flexibility in the study. Following qualitative methods helped me to unravel the current waste management situation, understanding the perception of the officials in municipality and of the community people (women) involved in solid waste management practices. This helped me to eventually suggest recommendations to improve the existing waste management system.

#### 4.1 Preparation of Fieldwork

Before travelling to Nepal for the fieldwork, preparation work was done in Norway. Preparation of the interview guide and study of the qualitative methodology to be followed was done. During three months in Nepal field study took place in Lalitpur Sub Metropolitan City (city adjacent to capital Kathmandu) where data was collected. After the fieldwork, collected data was transcribed to computer and was analyzed back in Norway.

#### 4.2 Selection of Stakeholders /Participants

Selection of the participants for the study were based on the fact that they should be involved in the solid waste management system of the municipality directly through the government and non-government organizations or indirectly through women's group. Additionally, their experience and contribution in SWM activities was of major focus during their selection.

To select the participant for the interview and focus-group discussion purposive sampling method was employed. This method of sampling is a technique widely used in qualitative research for finding out and selecting information-rich cases with the most effective use of limited resources (Patton, 2002). This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell, Plano Clark and Smith, 2011). In addition to knowledge and experience, Bernard (2002) and Spradley (1979) (as cited in Palinkas, Green, Wisdom, Horwitz, Duan and Hoagwood, 2015) defined the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner.

Initial information about who to contact and where to go, was from the official website of the municipality. It said that the environment section of the municipality, dealt with waste management work. Firstly, to get in touch with the contacts, I went to the environment section of the municipality and fixed an appointment with the environment engineer of the municipality. After the meeting with environment engineer, through him I got contacts of other officials of the municipality working in solid waste management. To meet them I had to submit an application along with the letter provided by NTNU to the head office of the municipality asking for their permission. Only after that, I went to the community development section of the municipality to meet the officials who dealt with women's group and waste management. Focus during the fieldwork was finding individuals in government offices involved in the solid waste management system of the target municipality and planning meeting with them to get the relevant information. I got to meet the concerned staff only after my third visit. Mostly they told that the concerned staffs are busy and other times they were out of the office.

Four stakeholder groups: Government officials, municipality officials, NGO officials and members of women's group were chosen in this study as they may be considered as key actors in the SWM cycle of the municipality, right from generation to final disposal.

Three FGDs were carried out. Along with it, twelve IDIs with the staffs of municipality, NGOs and women's group were done. In the FGDs four women's group in total were included from the different wards of the municipality.

This includes twelve in-depth interviews that were mostly formal and informal conversations with few other people. I consider these formal interactions to be my key informants:

- Environmental Engineer of Lalitpur Sub-Metropolitan City Office Municipality
- Section Officer of the Community Development Section
- Legal Officer Solid Waste Management Technical Support Center
- Section Officer Solid Waste Management Technical Support Center
- Research and Development Officer NEPCEMAC
- Officer Community Development Section LSMC

- President Women's Group (Karunamaya Mahila Samuha)
- Secretary Women's Group (Karunamaya Mahila Samuha)
- President Women's Group (Eikhache Mahila Samuha)
- Vice President Women's Group (Srijansil Mahila Samuha)
- Vice President Women's Group (Jagaruk Mahila Samuha)
- Member Women's Group (Jagaruk Mahila Samuha)

Lalitpur Municipality-Community Development Section is the office responsible for dealing and mobilizing women's group. It provides solid waste management trainings to the women's group registered in the municipality. I was also invited to the trainings provided by the municipality, as the trainings were mostly carried out in the ethnic language Newari, looking at the number of participants who belong to the Newar<sup>1</sup> community. For me language was a barrier as I do not know the language, but I requested them that it would be nice if one of the staff of the municipality translated for me.

After few visits, the staff there gave me information about the registered women's group so that I could take my fieldwork further. During the trainings, I clicked pictures but did not record anything as I would need another person to do the translation for me, but I wrote everything the translator told me.

After my visits to the community development section, I made appointments with the women's group who were currently actively participating in the solid waste management. There are more than eighty women's group registered in the community development section of the municipality. Women's group selected for the study were mostly based on their activeness and achievement in solid waste management practices. Some of the women's group selected have been awarded the best group by the municipality. These awards were based on their performance regarding waste management practices. I visited the women's group and scheduled meeting with their presidents and members. Women's group members were co-operative and responsive. Though they did not

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<sup>1</sup> Newars are the ethnic communities of Kathmandu Valley, speak Newari as their mother tongue.



have any written report except their meeting minutes, they were ready to provide the information they had. I had to rely mostly on their verbal responses for the information.

### 4.3 The Fieldwork

The fieldwork was carried out mostly in the months of June and July. In Nepali, national calendar July officially marks the end of the fiscal year. It is the time when offices around the nation are busy preparing their annual reports. Due to this reason, staffs were busy to give time. But I later went again to some of them in August, when they comparatively had more time to fill in more information for my study. Meetings with them were formal and in national language Nepali. Most of the days I had to invest sometime waiting for them, which I realized later is going to be the same for the later part of my field work. Though I knew few people in the municipality they were either posted in other sections and some were rather too busy. Later, I was able to meet the people who I thought would be helpful in providing me the related information. These were the environment engineer working at the municipality and legal officer at SWMTSC, who turned out to be insightful about the waste management problems in LSMC.

### 4.4 Methods of Data Collection

In order to collect primary data interviews, focus group discussions and observation methods were used. FGD was chosen as would help to get the views of different people who got the similar type of training, whereas interviews would help to understand the situation deeply and observation would help to eliminate any bias involved in the process. These methods of primary data collection have been crucial for the study since LSMC the study area lacks authentic data for issues concerning solid waste management.

To ensure that the information collected is valid and reliable, various methods were used. More than one method was used to ensure the consistency of information provided by different sources at different point of time and from different perspective. The methods chosen for data collection were keeping in mind the research questions for the study, which are as follow:

- To find out how waste management system is related to good governance through the case study of a metropolitan city.

- To describe the current waste management situation in the municipality including the practices and main challenges.
- To understand how the involvement of women's group as a method of public participation has resulted in solid waste management in the municipality.
- To suggest future solutions and possibilities for a more sustainable waste management in the municipality.

#### 4.5 Semi-structured interview

The interviews were in-depth and semi structured. It was conducted using a questionnaire with certain questions and topics that needed to be covered (see AppendixII). Semi-structured interview was used since this method gave greater flexibility. This method allows for the interviewer to get elaborated information. Interviews were mostly in-depth, carried out with the help of interview guides. The use of semi-structured interviews allowed the respondents to share their thoughts and concerns without making it public. In order to ensure that important information was not missed, I used recorder when the respondents were comfortable with it. While for three government officials, one from the municipality and two from SWMTSC who did not want their responses to be recorded, I took down notes while conducting the interview. Participants consent was taken before doing the recordings, clicking the pictures and to use their quotes in the study.

Perception of individuals about the current waste management system, what they felt are the major areas of concern and what are the obstructions to sustainable solid waste management and their views for a future waste management system were the issues taken into account during the interviews. The respondents were divided into three categories: government officials, members of women's group and NGO representatives. In all 12 interviews were conducted. The interviews lasted from 30 to 90 mins depending upon the work and experiences of the interviewees. The interviews were mostly in Nepali but for some interviewees who were more comfortable with the ethnic Newari language, a translator was present. Later transcriptions were made in English. During transcribing elaboration of the interview was done in order to fit the information in different sections of the dissertation without changing the original meaning of the interviews. The table below shows the number of respondents by gender and affiliation.

<b>S.N.</b>	<b>Affiliation</b>	<b>Male</b>	<b>Female</b>
1	Government Officials	3	2
2	NGO Officials	2	0
3	Women's Group	0	5
<b>Total</b>		<b>5</b>	<b>7</b>

Table 1: Respondents by Affiliation and Gender

Author, 2016

The interviewees, particularly women from women's group were enthusiastic to share the information. Government officials were the first one to be contacted for the interview as government is the highest body in the waste management system. First interview was carried out with the environment engineer of the municipality, person responsible for the waste management in the municipality. His work load could be seen even when interviewing him as his mobile was constantly ringing, and number of people were waiting to meet him. When asked about his busy schedule, he said that he is not only an environment engineer but also head of environment section of the municipality, so he becomes more responsible. When I conducted interview with him I requested him for some time later in the month so that after all the interviews, I could share other people's views with him and he could provide me more information about the issues that would come up later in the data collection process. Interviews with the government officials usually took more time than estimated due to their busy schedule, so I had to keep the waiting time in my mind. While interviews with NGO officials were on time and the responses given by them were mostly focused on the work they do in collaboration with the municipality for solid waste management in their respective wards as assigned by municipality. In case of interviews with women's group, the interviewees were enthusiastic about the whole process. Their views were quite similar about the trainings provided to them and materials distributed to them by the municipality but different about the daily functioning of their respective group. As each group wanted to take their group activities differently in future. Some wanted to make their groups bigger while some were satisfied with their current size.

#### 4.6 Focus Group Discussion

A focus groups discussion is a sort of group interview where a group discussion is done together in a smaller group of around five participants (Wibeck and Asplund, 2000; Kreuger and Anne, 1994). In focus group method, a group of people discuss a topic given by the researcher. This method was deployed to get the information from the participants. As this method provides participants space to discuss a particular topic put forward by the researcher in a context where they are allowed to agree or disagree with each other. Focus group discussions help the researcher to examine the way a group thinks about the given issue allows you to explore how a group thinks about the issue, the range of opinions and ideas, and their experiences and practices. It was carried out among the women's group, as they were most relevant stakeholders in waste management outside the government and NGOs. They gave their views on the current solid waste management system in their wards. Participants in the women's group were more open and expressed themselves without any hesitation from the beginning of the discussion. Three focus group discussions were held. Focus group discussions were carried out with the members of the four most active women's group, which were the part of the waste management trainings provided by the municipality. These discussions had 5-6 people from the four different women's group holding different positions in the group, each of them had different view on the issue of waste management and their contribution to it. Whenever they wanted to put forward their views, they raised their hand so that the confusion and misunderstanding could be reduced. In general, women were confident and respected each other during the discussion. Their views about the solid waste management trainings provided to them by the community development section of Lalitpur Sub Metropolitan City Office were considered during the discussion as they had different views about the trainings. The table below shows the number of focus group discussions carried out during the field work.

<b>S.N.</b>	<b>Focus Group Discussion</b>
1	5 person
2	6 person
3	5 person

*Table 2: Focus Group Discussion*

*Author, 2016*

#### 4.7 Participant Observation

According to (Yin, 1982) observations are a form of evidence that do not depend on verbal behavior, and the method enables the investigator to observe the phenomenon under study directly. As the phenomenon under study was municipal solid waste, observation was used to gather information in addition to other methods of data collection like interviews and FGDs. Participant observation enable researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities. (DeWalt and DeWalt, 2002). In the fieldwork, I visited the women's group in their workplaces, and they invited me to their house. In their respective houses, they showed how they are using the compost bin, making compost from the organic household waste, and rooftop gardening. Whereas, other women's group took me to their plastic collection center, where I could see how they buy the plastic from other women's group and households nearby. Photographs were taken of the different waste management practices adapted by the women.

Direct field observation also took place when I was walking through the street. Especially the main streets were clean and waste was picked. But the inside roads "gullies" were littered by passersby, which signified that people were more careful about the main city areas less about the smaller inner areas. The municipal vehicles collected the waste accumulated in the main city area. In the course of the field observation, photographs were taken of waste scenes such as street litter, waste storage containers, the transportation and final disposal of waste. This method of observation helped me to eliminate the subjective bias as I got to observe both the trainings and the use of the training in the household. It helped me to understand what is currently happening in the research area. Also, helped to validate information provided by the interviewees during the study. The ability of a researcher to experience firsthand, social happenings and actions of related actors in the same environment, furnishes a means through which validation of data and further understanding of the topic may be achieved. This may be achieved via seeking correlations or disparities between what actors in the study and what they practice in reality (Bryman, 2004).

#### 4.8 Secondary Data Collection

Secondary data is the data that is already available and has been collected and analyzed. Secondary data may be published or unpublished. It is available through the publication of government and non-government organizations. Other sources of secondary data are books, reports and journals, books, magazines, public records and statistics. While using the secondary data few things are kept in mind like reliability of data, adequacy of data and suitability of data. The main challenge involved while using secondary data can be the use of data to fit with the research questions and study purpose. In my study to solve this dilemma, focus was mostly on data that dealt with municipal waste management and governance. In addition, documents dealing with women participation in waste management were analyzed.

Secondary data for the study involved documents published by the municipality, which was made available only after their permission. Few other documents were made available after permission by the NGOs as those documents were internal documents of the organization. Data like census data and annual reports from ministries of environment and local development were accessed from their official websites. The data consisted of government acts and policies for waste management and about the history of the case study area. The information was published in the official websites of the concerned department, which made it more reliable than coming from other sources. The documentary data thus obtained were used as a supplement to the information collected from interviews, focus group discussions and field observations.

#### 4.9 Analysis of data

The research followed qualitative methods so data from interviews conducted, focus group discussions and observations were analyzed manually. It was done by making summaries of the information from the respondents and supporting it with relevant quotations from them. Along with it, data from the secondary sources were also used to understand and support the information. Mainly the process of content analysis was followed to analyze the interview data. As, content analysis gives the ability to researchers to structure the qualitative data collected in a way that satisfies the accomplishment of research objectives (Weber, Krippendorff and Bock, 2008). The data collected from the various sources was transcribed and then classified into categories. The organized data was helpful to get the overview about the current SWM situation. Data was

categorized as responses from government officials' perspective, women's group perspective and NGO officials' perspective. In addition to it some sub-categories like waste generation, waste collection and transportation, waste decision-making process were also made so that the information collection could be reduced and simplified.

#### 4.10 Positionality (Insider/Outsider)

Throughout the data collection, I was conscious about the issue of positionality in relation to my research subjects. As it is an important factor that could either enhance or hinder the data collection process. As a Nepali doing research in my own country made me an insider as compared to foreign researchers. But with regards to my respondents I was an outsider, as they did not know me before. In addition to that some of them were not comfortable to speak Nepali the national language and preferred Newari which made me feel more of an outsider. But as I started to conduct my interviews with the respondents they became more co-operative as they felt I was as much concerned about the waste management system in the country as they were. But some were still skeptical about my research intentions as they said, a lot of people from foreign universities come and study about the waste issues here, but the problem is still here nothing has changed in years. Still most of them had high expectation from the educated youth population in future. But every time I talked with someone I made clear the purpose of my study, so they do not have any misconceptions.

Thus, my familiarity with the study area and the topic made me an insider and created opportunities for understanding the whole issue from people's perspective. While my unfamiliarity with the language and a student from a foreign university unknown to the respondents to a certain degree made me an outsider. But with more interaction and time I was able to gain the trust of my respondents.

When approaching the women's group, I already had the idea that I cannot approach them in the morning time as they would be busy with their household chores. So, I always fixed the time to meet them after 12 pm. As one of the members of the women's group told me *"I can give you my time from 12 noon till 3 pm as I have to pick my kid from school at 4pm"*.

On the other hand, I had some idea that government officials will be difficult to be found in office in afternoon, so I went to the government offices before noon. They usually go for the field work after lunch hours Whereas they were skeptical about providing me information and talking to me in the beginning as one of the officials also told me “*a lot of students from universities come for their study on waste management in Nepal but their research has not helped us to make the waste management situation better*”

#### 4.11 Self-Reflection as a researcher

The data for the study was gathered through the participation of people employed in different sector in solid waste management in the municipality; yet the final results are based on my own interpretation of the collected information and data. As a researcher, I had to make sure that I do not influence the research itself, especially as a researcher coming from the same socio-cultural background. In order to achieve this I went to the field without any type of presumptions about the study area and the informants. Such that, I would not get affected by the situation in the study area and the behavior of the respondents. Then as a researcher I could independently analyze and present the data in the thesis.



## 5 Background Information of the Study Area

### 5.1 Background

The study was conducted in Lalitpur Sub-Metropolitan City, third largest city of Nepal. Lalitpur Sub-Metropolitan City (LSMC) is located between the latitudes 27 °32' 13"and 27 °49' 10" North and longitudes 85°11'31"and 85° 31' 38" East, in the southeast of Kathmandu in Central Development Region of Nepal. With its urban history dating back as far as 2000 years, LSMC is one of the three major cities located inside the Kathmandu valley, besides Kathmandu and Bhaktapur. The total area of LSMC is 15.64 sq. km and it comprises of 30 wards out of which ward no 15 is the largest (2.43 sq.km) and ward no 21 is the smallest (0.93sq.km). The valley lies at a mean elevation of about 1350m above sea level. The altitude of the city varies from a minimum of 1266m to a maximum of 1366m above sea level, which shows the relative flatness of the ground on which the city is located.

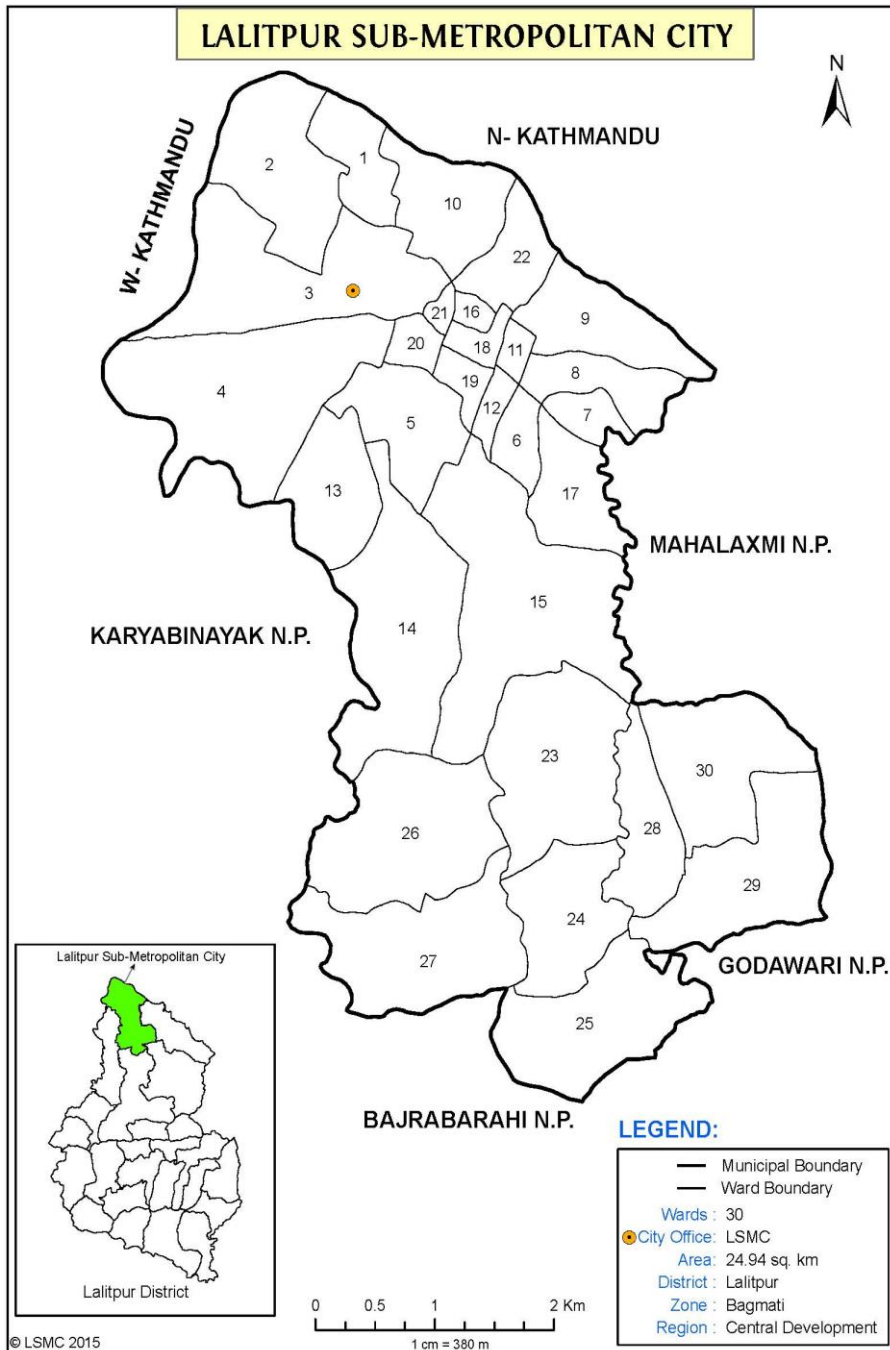


Figure 2: Administrative boundary of LSMC

LSMC, 2016

## 5.2 Historical Overview of Lalitpur Sub-Metropolitan City

Initially in 1918, A. D. the “Patan Sawal” was issued and “Chhemdol” (Sanitation Management Office) was established for city management and sanitation in this historical city. In 1953 A.D., the same office became Lalitpur Municipality and finally Lalitpur Sub-Metropolitan City in 1995 A.D. The municipality has a long history with the old name “Patan” and a foundation dated back to third century. Till date it is famous for fine historical art and culture. LSMC has its office located at Pulchowk, Lalitpur and is the sole agency for providing municipal services and carrying out urban development works in the city of Lalitpur. After the enactment of Local Self Governance Act in 1999, municipalities got power and authority to plan and implement developmental works regarding urban infrastructures and services within its jurisdiction. According to Local Self Governance Act Lalitpur Sub-Metropolitan City has provision of; the town assembly, the municipal board, Mayor, Deputy Mayor, Ward Councilors and Chief Executive Officer. It is divided into 30 Wards and each Ward Committee consists of; one Ward Chairman, three Ward Member, one Woman Member and one Ward Secretary (LSMC,2014).

## 5.3 Climate and Rainfall

LSMC lies within the warm temperate climate zone of the Kathmandu valley, with typical monsoonal two-season year. Yearly average temperature in the city is 15-20 degree Celsius and receives yearly average rainfall of 2000-2400 mm (LSMC, 2014). There is the dry season from October to May and there is the wet season, the monsoon, from June to September.

## 5.4 Population

According to the census report of 2011, the total population of the Lalitpur Sub Metropolitan City is 220,802 that consist of 107,021 females and 113,781 males respectively. Household, total population and population by sex in ward level of Lalitpur Sub-Metropolitan City are given in table below. However, the population of LSMC, as per census 2001, was 1, 62,991. As per 2001 census data, there were altogether 34 996 households in LSMC with an average household size of 4.66 persons (CBS,2012). The table below illustrates the total population with total number of households in the municipality.

<b>Wards</b>	<b>Households</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
1	2,221	8,434	4,665	3,769
2	4,839	19,061	10,369	8,692
3	3,528	14,082	7,315	6,767
4	3,913	15,367	7,580	7,787
5	1,516	6,404	3,152	3,252
6	1,563	6,780	3,474	3,306
7	1,839	7,849	4,075	3,774
8	2,816	11,400	5,958	5,442
9	3,484	13,908	7,385	6,523
10	1,729	6,554	3,508	3,046
11	1,010	4,458	2,237	2,221
12	1,342	5,891	3,064	2,827
13	3,772	14,867	7,400	7,467
14	5,438	21,232	10,518	10,714
15	3,480	13,858	6,999	6,859
16	858	4,362	2,156	2,206
17	2,678	10,644	5,551	5,093
18	1,200	5,777	2,851	2,926
19	1,774	7,385	3,779	3,606
20	1,978	7,721	3,958	3,763
21	1,143	4,659	2,384	2,275
22	2,460	10,109	5,403	4,706
<b>Total</b>	<b>54,581</b>	<b>220,802</b>	<b>113,781</b>	<b>107,021</b>

Table 3: Population of different wards in LSMC

CBS, 2012

## 5.5 Land Use Pattern

The city of Lalitpur is one of the three main cities in Kathmandu valley and it consists of several other small satellite settlements like Lubhu, Khokana, Bungamati. The city like other cities in Kathmandu valley shows distinct urban settlement and land use pattern. The settlement generally is compact in nature. Considering rapid urbanization in the city, Kathmandu Valley Urban Development Program has formulated a certain land use legislation to guide the pattern of land use within the city (KMC, 2015; LSMC, 2014). It provided the basic guideline that has been followed for the purpose of preparing a current land use map. The area covered by different land use zones have been presented in a tabular form below.

<b>S.N.</b>	<b>Zone</b>	<b>Area in sq.km</b>
1	Core Area/Inner City Area	0.97
2	Residential Area	13.03
3	Institutional Zone	1.08
4	Industrial Zone	0.17
5	Conservation Zone	0.066
6	Surface Transportation Sub-Zone	0.0055
7	Sports Zone	0.096

*Table 4: Land Use Zone of LSMC*

*LSMC, 2014*

## 5.6 Waste Management in the study area

Solid waste management has been an area of concern for the municipality along with many social, political and economic challenges it faces today. The issue of waste management in the municipality has become more severe in the absence of proper solid waste management planning; particularly dealing with the multitude of state and non-state actors involved in the system without clear definition of roles and responsibilities.

## 5.7 History of Solid Waste Management in Nepal

Traditionally waste management in Nepal is considered the job of the untouchable castes. Prevalently, the lowest caste among the four castes in the Hindu caste system. Historically, as early as 1768 waste management was done by *chyame* and *pode* (the sweepers) (Thapa,1998). People from these castes were hired by the city-administration to collect solid waste. They were equipped with primitive tools, mostly made from local materials and the waste collected was dumped in the nearby river or open field. As the amount of waste generated was relatively small this type of dumping did not have a huge environmental consequence at that time (Aryal, 1986: IUCN 1992 as cited by, Thapa,1998).

In 1919, then Prime Minister Chandra Shamsheer introduced *Safai Adda* (the sanitation office) to handle the refuse in Kathmandu Valley (Baker,1997). At the time, waste was mostly organic and it was recycled to produce compost. In the *sagaa* system the putrescible waste was sold to farmers or dumped into the pits called *sagaa* (*saa* means compost and *gaa* means pit in the ethnic Newari language of Kathmandu valley), these pits were located in the house. The putrescible were also disposed in *naugas* (pits under the stairs) located on the ground floor of the house (Tuladhar, 1996 as cited in UNEP, 2001).

It is only in 1950s when Nepal officially opened its borders to outside world for commerce and trade, the composition of its waste shifted toward more inorganic, non-degradable waste. In 1950s when the government designated the municipalities, waste management became the responsibility of the respective municipalities. Along with the municipal waste management, system of *Sagaa* and *nauga* also existed in Kathmandu Valley.

The compost from the *saagas* and *naugaas* were used in the agricultural plot. Almost all the waste was of organic nature. Disposable waste was quite less in amount. Most of the waste could be reused, recycled and some of it was assimilated into the soil. The organic waste easily biodegradable was either used as animal feed or widely recycled into the compost manure.

With the advent of the Green Revolution in Nepal in 1960s, introduced a dependency on subsidized chemical fertilizers and pesticides which ultimately brought an end to the dominate practice of

using local manure in the family fields of the Kathmandu Valley (Kathmandu Municipality 1994, as cited in Baker 1997).

The composition of waste shifted toward more inorganic, non-degradable. The major reason for the change in composition was due to the rising standards of living of public. Changes in food consumption practices especially the change in food processing and packaging technology increased the use of inorganic materials like plastic, tin, metal and paper. While changes in domestic fuel usage has also decreased the amount of other types of solid waste. Whereas the chemical composition of waste has changed to become more inorganic and toxic in nature. Information about the chemical composition of solid waste is important for treatment, composting, and possible hazards that may arise due to its mishandling. Changes in organic content of waste made it more difficult to assess the value for compost production (Ackermans, 1991) as cited in (Baker,1997). The increasing inorganic content of solid waste made the fertilizer prepared from the saagas and naugaas no longer suitable for agricultural use. They also became out of use as better understanding was developed towards sanitation, and household treatment of solid wastes was deemed inappropriate by municipal authorities. Traditional composting pit called “*Saagaa*” part of every household setting started to disappear from the urban setting (Baker, 1997).

### 5.8 Advent of Modern Waste Management System in Nepal

In Nepal, concept of modern solid waste management system developed in the 1970s and developed fully in late 1970s. It all started when Professor Flintoff from Stuttgart University prepared a World Bank report concerning the waste management in Kathmandu valley. Till then waste management meant street cleaning activities. Waste was either disposed in the river banks or into the *saagas*<sup>2</sup> and *naugas*<sup>3</sup> In 1976, Prof Tabasaran also from Stuttgart University prepared a report based on the recommendations of Flintoff Report. This report later became an outline for the waste management. Later in 1979, the report prepared by Tabasaran became the foundation for the project agreement between the Government of Nepal and German Government. As a result of the agreement, Solid Waste Management Project (1980-1993) came into existence (KMC and

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<sup>2</sup> *Saagas* common pit used for collecting the waste by the whole community

<sup>3</sup> *Naugas* pit dug underneath the stairs of the ground floor

World Bank, 2001). Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) started the project with Solid Waste Management and Resource Mobilization Centre (SWMRMC), Ministry of Local Development in Kathmandu Valley comprising of Kathmandu, Lalitpur and Bhaktapur districts (KMC and World Bank,2001).

The project was considered a success to manage solid waste in Kathmandu in late 1980s and the early 1990s. It was carried out in four phases with the establishment of compost plant in Teku and a landfill site in Gokarna in Kathmandu district (Anderzen and Blee,2003). The project ended in 1993 but the system established by the project collapsed due to insufficient funds (KMC and World Bank, 2001).

### 5.9 Waste composition and generation

According to Environment and sanitation section of LSMC, nearly 85 tons of solid waste is generated daily in LSMC of which 42 tons is from household. At present LSMC and private service providers has been able to collect nearly 60 tons/day, while the municipality does not have information about where the remaining 15 tons of waste goes (ADB, 2013). The average per capita household waste generation rate in Lalitpur is 0.186 kg per person per day while the average per capita household waste generation rate in Kathmandu municipality the capital is 0.497 kg; this is comparatively low for the third largest municipality of the country (Dangi,Pretz,Urynowicz, Gerow and Reddy,2011). The total amount of waste generation is almost 42 tons per day from the household level of Lalitpur, whereas a little less amount of waste is generated from the institutional and commercial sector of Lalitpur. It is estimated that waste from households in general contributes to about 50% of the total MSW generation. Thus, the average MSW generation was found to be 372 gm per capita per day. With these per-capita waste generation rates and population for the year 2011, the total MSW generation from Lalitpur Sub-metropolitan city is estimated to be about 84 tons/day. The household composition consists of organic wastes (78%), paper (5%), plastic (10%), metal (1%), glass (2%), rubber and leather (1%), textile and other (3%) (ADB, 2013). Average composition of municipal solid waste and average composition of household waste is depicted in the chart below.



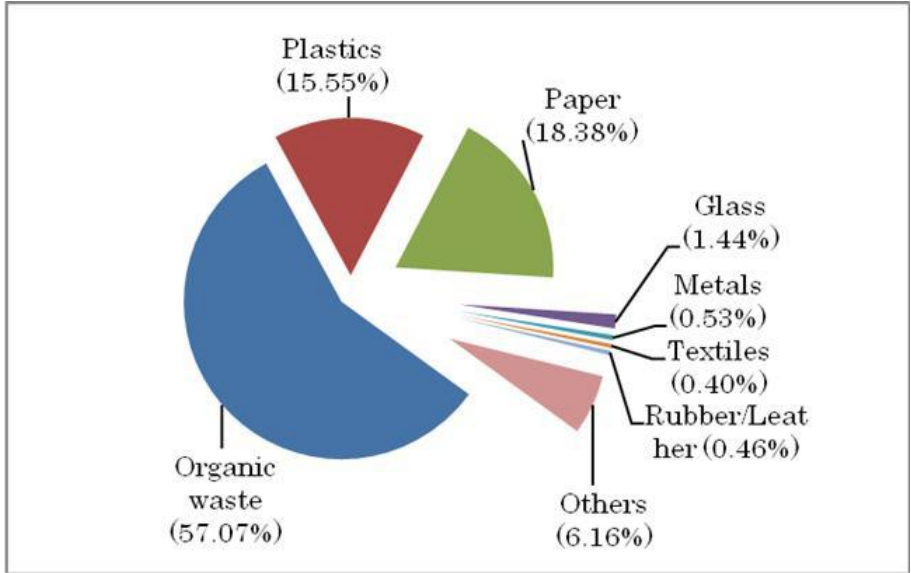


Figure 4: Average Composition of Municipal Solid Waste in LSMC ADB,2013

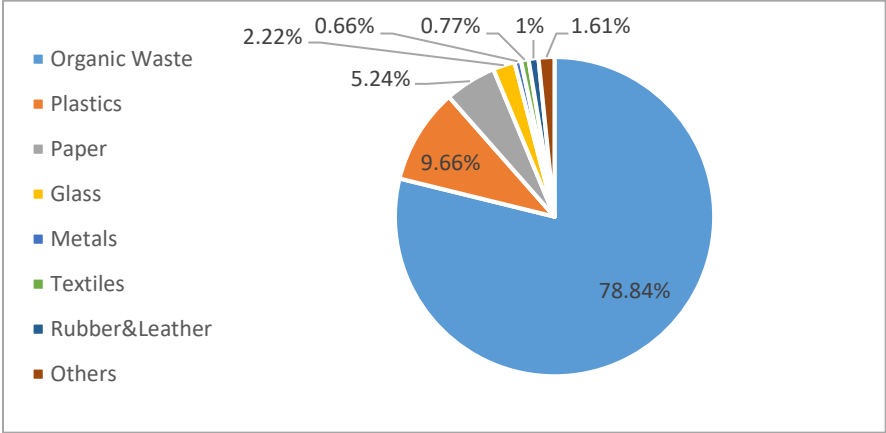


Figure 3: Average Composition of Household Solid Waste in LSMC ADB,2013



## 6. RESULTS, ANALYSIS, DISCUSSION

The analysis and discussion followed is based on the extensive literature study on solid waste management and the information gathered from the in-depth interviews, focus group discussion and observation. The information thus collected was synthesized to better understand the solid waste management situation in Lalitpur municipality. In-depth review of secondary data, published and unpublished material was done in order to understand the research topic clearly. The chapter presents qualitative information particularly describing the existing SWM system. It also presents various existing legislations and acts for solid waste management in Nepal. This enabled me as a researcher to understand the gap between the existing rules, regulations and practices on ground. It helped me to generate a holistic view of the prevalent waste management situation and challenges being faced by the sector. Along with it, analysis of collected data helped to look into emerging trends and patterns in solid waste management in the municipality. Various models have been used and discussed in relation to the theory chapter to get a critical insight into the solid waste management situation in relation with governance and role of women's group participation.

### 6.1 Political Change and its effect on Waste Management in Nepal

In 1990s, the political scenario of the country changed from a monarchical system to multi-party democratic system. This change in the political situation led to establishment of many community based organization and non- government organizations, which could carry, out more participatory and localized efforts towards solid waste management. At present, according to the Local Self Governance Act (1999), every municipality takes the responsibility of solid waste management in their respective municipalities (KMC, 2015). However, the lack of effective waste management system due to insufficient resources and political instability has been an issue with the municipalities in Nepal. This lead to the need for the involvement of Non-Government Organizations and Community Based Organizations to deal with the deteriorating solid waste management situation in the municipality. Thus, a number of NGOs, CBOs in collaboration with the municipality have been working in the waste management sector. In some municipalities, even the local communities collect the waste from the residential areas and transport it to the public containers and charge the households for the services (Gautam, 2001) as cited in (ADB, 2013).

The Local Self Governance Act (1999) was introduced to promote decentralization and fuel participatory development in the country (KMC,2015). It was forwarded by the Government of Nepal as a provision for the participation of public in the process of governance through decentralization (Dhungel,2004). Especially aimed for the institutional growth of local bodies by providing them power and responsibility to formulate and carry out plans and programs. It was endorsed with a vision that it would help to facilitate participatory development process in the country. Involvement of socio-economically backward groups will be possible through reliable and accountable local bodies; including development of leadership at local level and capacity building of local bodies so that they can act as agents of local self-governance system. It gave a two-tier system of local government with Village Development Committees (VDCs) as village local government and municipalities as town local government and District Development as the upper tier. Municipalities became the urban local government institutions in Nepal and each municipality has an elected executive and an elected council. Nevertheless, since mid-2002, A.D. the effect of Maoist insurgency and political crisis at central level has negatively affect the functioning of local government.

After the end of tenure of elected local governing bodies in 2002 A.D.; Local governing bodies are without elected representatives. It has almost been fifteen years now. District development committees (DDCs), municipalities and village development committees (VDCs) the local governing bodies in lack democratically elected representatives. Since then, centrally appointed civil servants have run local bodies. This halts the job of appropriate use of public resources for the various development agendas at local level. However, there is an arrangement of “all party mechanism” placed as a proxy to the elected representatives. It is based on the idea of consensus politics in which every party has their representative present in the body (Gurung, 2011). As they are not elected bodies, the issue of their accountability and transparency arises here. They lack motivation to perform productively, transparently, introduce new programs, and mobilize the public funds appropriately. This political system had reflected directly into the governance of public institutions of Nepal, this has affected the way public services are planned, managed and delivered. Like other developing countries local governing bodies of Nepal, has been blamed for ineffective development programs, misappropriation of budget, failure in service delivery (Gurung,2011). In such scenario establishment of an accountable local governance has become a

perquisite to achieve development agendas and end democratic crisis. Presence of local government provides the public a platform to put forward their needs. Presence of fairly elected local government depicts the participatory governance which is an essential feature of democracy.

After the local elections in 1998 A.D. no other local elections have been held in Nepal, since 2002 there is a vacuum of elected representatives which has made establishment of good local governance an elusive concept. The country came out of the decade long conflict between the government and rebelling Maoist rebellions in 2006 A.D. After the comprehensive peace accord with them, they joined the mainstream politics of the country since then have been a large part of national government. Still the issue of local election is not sorted out as the ruling political parties show little or no interest in local elections. The vacuum in local governing body has affected every public service delivery system of the country waste management system being one of them.

## 6.2 Current Municipal Solid Waste Management System in Nepal

In Nepal, solid waste management is mainly collection and disposal of waste (Pokharel and Viraraghavan, 2005). Out of 58 municipalities in the country, 17 of them do not have a separate section designated for Solid Waste Management. Of the total budget, the municipalities spend an average of 10% for SWM, in which nearly (60-70) % towards street sweeping and collection, (20-30) % on transportation and disposal (ADB, 2013). Lalitpur Sub-Metropolitan is one of the few municipalities in the country with an operating sanitary landfill site.

With rapid urbanization, effects of globalization and change in the consumption habit the amount of waste generated became significantly high. Thus, a new scenario emerged, in which solid waste along with effluent from industries and wastewater were dumped into the river system. This led the municipalities all over Nepal to increase their efforts for waste management. Despite significant efforts in the last decades, the majority of the municipalities including Kathmandu and Lalitpur are not able to manage the growing volume of waste in a sustainable manner.

The current solid waste management system in Nepal in general is acknowledged to be highly improper and inefficient. Especially in urbanized cities like Kathmandu, Lalitpur, and Pokhara municipal solid waste management system is deemed substandard. The rapidly increasing amount

of municipal solid waste in Nepal along with poor management and insufficient financial resources makes waste management a severe problem. The poor state of solid waste management in urban areas (of developing countries) is now not just an environmental problem but also a major social handicap (Daskalopoulos, Badr and Probert,1998).

### 6.3 Policy Framework for Waste Management in Nepal

With a motive to improve SWM, the then Government of Nepal established the Solid Waste Management Board under the then Ministry of Construction, Supply and Transportation. Undertaking various initiatives between 1981 AD and 1986 AD. After that came several other acts and regulations (JICA,2005).

#### 6.3.1 Solid Waste Management and Resource Mobilization Act 1987

Realizing the need of having legislation on SWM, Solid Waste Management and Resource Mobilization Act, 2044 (1987 AD) was passed and brought into force in 1987 AD. This Act paved the way for the establishment of Solid Waste Management and Resource Mobilization Center as an autonomous body replacing the Solid Waste Management Board (Dangi,Schoenberger and Boland,2015). For the effective implementation of the Act, the Solid Waste Management and Resource Mobilization Regulations and necessary statutes were framed and some new provisions on solid waste management were incorporated through amendments in the Solid Waste Management and Resource Mobilization Act.

#### 6.3.2 National Policy on Solid Waste Management 1996

The first Solid Waste Management National Policy was formulated in 2053 BS (1996AD) to tackle the emerging solid waste management problems due to rapid urbanization. The policy emphasized on waste management in municipal and urban areas. This policy is still in force. The main objective of this policy is to make solid waste management effective, to minimize the impact of solid waste on environment and public health, to treat solid waste as resource, to include private sector participation in solid waste management, and to improve public participation by increasing public awareness on sanitation (LSMC,2014).

### 6.3.3 Environment Protection Act 2053 BS (1997 AD) and the related regulations

In the process of internalizing the Environmental Assessment System in development proposals, the Government of Nepal enacted the Environment Protection Act (EPA).

The Environment Protection Rules (EPR) 1997, makes the integration of IEE and EIA legally binding to the prescribed projects. The Act prohibits the creation of pollution that may cause significant adverse impacts on the environment, or any such act that is likely to be hazardous to public life and people's health, or any act that disposes or causes to be disposed sound, heat, radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards (Tuladhar and Shakya,2014). The Act has made provision for appointing Environment Inspector in order to effectively carry out or cause to be carried out the acts of mitigation, avoidance or control of pollution or activities required to be carried out in accordance with the IEE or EIA (Tuladhar and Shakya,2014).

### 6.3.4 Local Self Governance Act 2055 BS (1998 AD) and related regulations

The Local Self Governance Act of Nepal has made ward committees responsible for managing the waste within their respective areas (LSMC,2005). The functions, duties and powers of each ward committee under the village development committee comprises of cleaning the roads, ways, bridges, drainage, ponds, lakes, wells, deep water, taps, etc. within the ward (ADB,2013). The Ward Committees are required to arrange for the disposal of wastes, dirt and rotten materials and to make arrangements to encourage the inhabitants of the Ward for maintaining sanitation (LSMC,2014).

### 6.3.5 Environment Policy and Strategy on Periodic Plans of the Government (Three year periodic plans)

There is no specific provision in the Environment Policy and Strategy regarding solid waste management. The Present Periodic Plan "Three Years Plan 2010-11, 2011-12,2010-2013 AD" emphasized promoting and extending sanitation facilities through public awareness at the rural and urban areas with the participation and contribution of the local government and users' communities (LSMC,2014). It has further emphasized IEE and Environment Impact Assessment for implementing any infrastructure development project. The plan has, under infrastructure development, targeted to construct 10 landfill sites and conduct feasibility study for another 10

sites(LSMC,2014). The plan has associated solid waste management with sanitation and infrastructure development activities.

#### 6.3.6 Solid Waste Management Act 2068 BS (2011 AD)

Finally, with an objective to modify and incorporate the laws relating to solid waste management and to arrange for the systematic and effective management of solid waste by minimizing solid waste generation at source, re-using & processing the waste and providing for proper disposal of the solid waste. The Govt. of Nepal enacted Municipal Solid Waste Management Act 2068 BS (2011 AD) effective from June 2011 AD (LSMC,2014). The objectives of the Act also include maintaining clean and healthy environment by minimizing the adverse effects of solid waste on public health and the environment. The local bodies have been made responsible for construction, operation and management of infrastructures for collection, treatment and final disposal of solid waste, including construction of transfer stations, treatment plants, etc. (KMC,2015). However, healthcare institutions and industries are made responsible to manage their biomedical and hazardous wastes (LSMC,2014). A local body is authorized to specify the time, place and method for disposal of solid waste and prescribe collection center for each settlement at such places, which is convenient to all. The local body is required to manage transportation of waste & provide means of transport of solid waste. The local bodies are expected to encourage reduction, reuse and recycling of solid waste and coordinate with industries for reuse of packing materials for reducing the waste. The local body is allowed to construct transfer stations for managing the initially collected solid waste in such a way that it would not cause adverse impact on public health (LSMC,2014).

The Act makes the local body responsible for constructing sanitary landfill sites as per environment protection act for the management and final disposal of waste. The Act prohibits management of waste without license, provides for issuance of license, and prescribes the procedure for issuance of license to manage the waste (LSMC,2014). It provides for the involvement of the private sector firms, CBOs and NGOs in solid waste management through competitive bidding. It also provides procedures for bidding, selection of successful bidder, authority of the bidder for collecting tipping fees against solid waste management services (KMC,2015). It authorizes the local body to give permission for construction and operation of



sanitary landfill site, treatment plant or any other infrastructure following the Environment Protection and other related laws. A Local Body is authorized to monitor the compliance to the specified standards and cancel any permit if required.

The Act authorizes for imposition and collection of service fees against solid waste management services and prescribes the basis for fixing such fees (tariff) and procedures for collection of such fees and the usage of the fees (Thapa,1998). It authorizes the local bodies or authorized private operator to suspend or stop the services if any user fails to pay the fee. The Act allows the local bodies for monetary punishment and/or imprisonment for violating the laws. The Act mandates the local body to carry out environment protection activities by preparing master plans for the affected area surrounding a landfill site. It authorizes the local bodies for formulation of rules, by-laws and guidelines, and issue directives. It authorizes the local bodies for formulation of rules, bye-laws and guidelines, and issue directives; it will be useful for every municipality to have waste management by-laws or guidelines that are approved by the Municipal Board (Thapa,1998). Additionally, there are also other laws, standards or guidelines to govern municipal waste management, which provides some provisions on the related aspects. According to the Local Self-Governance Act and its Regulations, municipalities can also develop by-laws to suit their needs (LSMC, 2014).

#### 6.4 Current Practices in Solid Waste Management in LSMC

The government of Nepal added eight new wards to the municipality in 2015/16 This makes the total number of wards in the municipality from 22 to 30; but the official data and information about the waste generation and waste management in these added wards are based on assumptions. Earlier 11 wards used to be covered by the municipality and 11 wards were covered by private service providers. However, with the increase in number of wards, LSMC directly provides services in 11 wards. The private organizations provide services in remaining 11 wards plus the newly added 8 wards, such that all 30 wards are covered. The map below shows all the wards of the municipality.

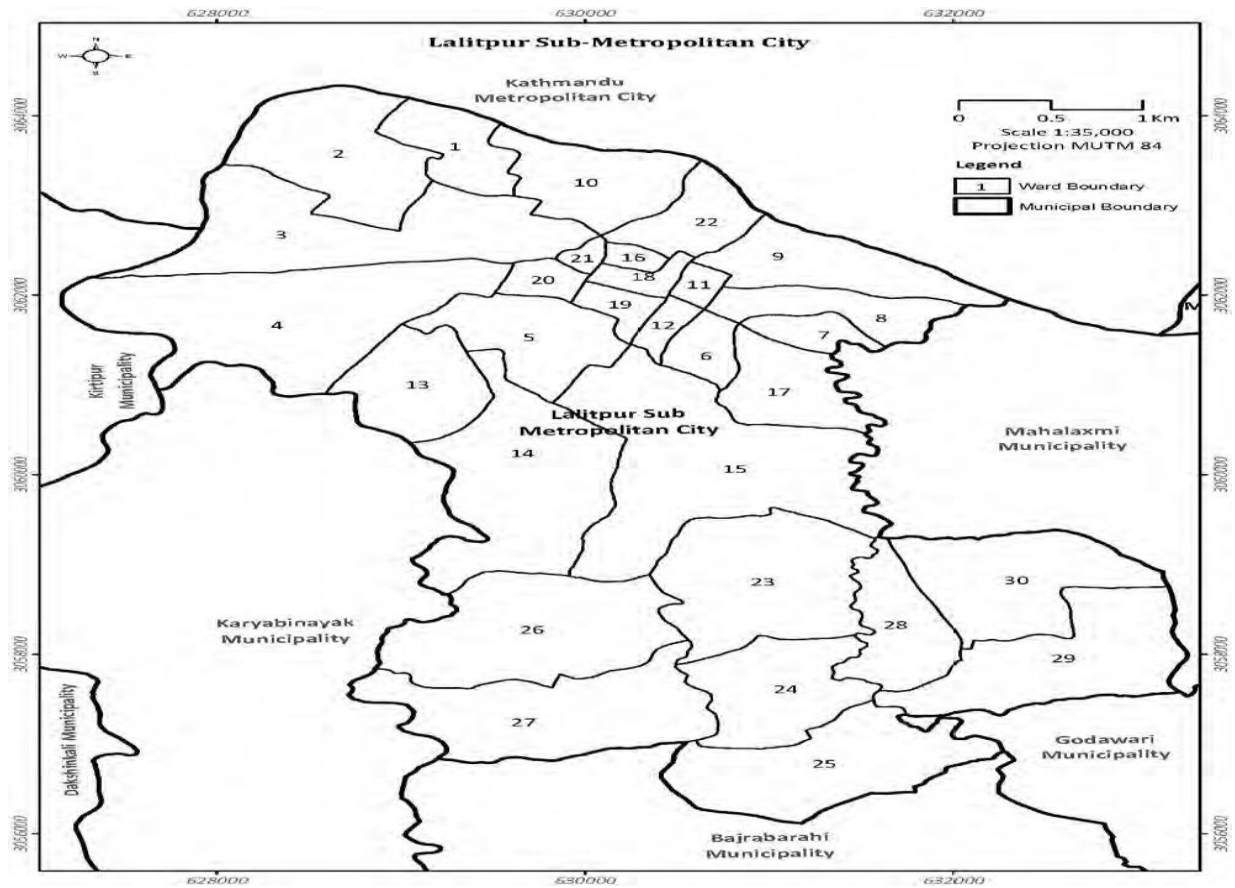


Figure 5: Administrative Boundary of LSMC

LSMC, 2016

The Solid Waste Management Act, 2011 SWM has given significant importance to source segregated waste management practice, prevention of burning of the waste and disposal in open space and nature; disposal of final waste to landfill site. In practice, it seems the municipality has not been able to fully implement and work according to the Act.

In theory, a typical functional waste management system includes the following aspects:

- Waste Generation at household level
- Reuse and recycle at household level (Feeding animals and composting)
- Primary waste collection and transportation to communal bin (transfer station)

- Secondary collection and transport to the waste disposal site. Collection not just the gathering of solid waste and recyclable materials, but also the transport of these materials after collection, to the location where the collection vehicle is emptied.
- Location may be a material processing facility, a transfer station, or a landfill disposal site.
- Storage at the transfer station is of primary importance because of public health concerns and aesthetic consideration.
- Waste disposal in landfill site.

Source:(Ndum, 2013)

Put forward by Seifert(2006a) as cited in Ndum(2013) a typical functional waste management system starts with waste generation at household level, with reuse and recycle activities. From the household, the segregated waste goes to communal bins, from the communal bins to transfer stations. In transfer station material processing activities are carried out. Additionally, storage facility at transfer station is safe and secure, then the waste is taken to the disposal site considering the public health and environmental issues.

In contrast to the typical system the municipality under study does not have all the elements of a typical waste management in place. Waste is generated from households, with limited segregation carried out by the women's group. Then the waste is collected by the municipality and private actors; collected waste is then transported to the respective transfer stations. At transfer station waste remains openly until it is transported to the landfill site. Material recovery system is absent, so plastic and recyclable materials are segregated manually by informal waste workers at the transfer station. Finally, waste gets transported to the landfill site with minimum consideration to environment and public health at the disposal site. The model below depicts the typical elements of solid waste management, for the municipality under study.



Figure 6: Functional Elements of Solid Waste Management in the study area

Source: Author, 2017

#### 6.4.1 Waste generation and segregation at household level

Households generate 42 metric tons of waste/day in the municipality with high percentage of organic waste. (ADB, 2013). This comprises the households in 22 wards of the municipality and does not include the eight wards later included in 2015/16 by the government of Nepal. The current waste management at household level is characterized by source segregation practiced by over 70 percent of households (LSMC, 2016). Source segregation is characterized by storing the organic waste in green bucket and inorganic waste in red bucket provided by the municipality. Initially two wards namely ward 22 and 13 practiced source segregation as a pilot project of the municipality but later municipality expanded its coverage area to more wards, leading to increased awareness, education and training to the household. Thus, source segregation is now practiced more widely as compared to a decade ago in the municipality. However, it is still comparatively at a smaller scale as compared to the demographic size of the municipality. Whereas, household waste management practices also include composting. Practices like burning the waste, feeding it

to the animals and disposal in open fields are also prevalent at times when the municipality is not able to collect waste for days.

#### 6.4.2 Organizational Structure of LSMC

Local Self-Governance Act of 1999 and Solid Waste Management Act of 2011 require municipalities to have a separate section or unit for the purpose of solid waste management within their organizational structure. Most waste management units are either part of the Social Development Section, Planning and Urban Development Section, or Community Welfare Section of the municipalities (ADB, 2013). In 2004, LSMC made a new organizational structure where Environment Section was made responsible for SWM activities. The Environment Section is comprised of two sub-sections, the Sanitation Sub-section and Mechanical Sub-section. Environment Section is headed by the environmental engineer who reports directly to the CEO of the municipality (JICA, 2005). Other divisions, like Public Works Division is responsible for the matters of SWM facilities planning, Also, community development section has been providing waste minimization training to women's group as a component of their community mobilization program for the last ten years.

The Community Development Section (CDS) has been responsible for community mobilization and awareness raising programs for women's groups through variety of training activities. LSMC has the Solid Waste Management Committee, composed of four ward chairpersons with municipality staff as observers, which was usually summoned on a monthly basis. This platform was used to settle daily waste management problems and make recommendations of some principles about SWM. Since, June 2005, this Committee has not been active. As the members comprising the office have not been elected, government officials are currently working in the committee (LSMC, 2014). The figure below illustrates the organization structure of LSMC for solid waste management related activities.



Figure 7: Organizational Structure of LSMC for SWM with related sections and sub-sections

JICA,2005

\* operational when elected political representatives will hold the office

### 6.4.3 Waste collection Practices in the Municipality

Waste collection is the service provided both by the municipality and the private service providers in the municipality

#### 6.4.3.1 Waste collection through collection point

Various activities are carried out for the collection of daily waste generated in LSMC. A curb-side and on-ground collection system has been introduced. In this collection method, the waste that is brought by the waste generators is piled up at the collection points, picked up manually, and placed in collection trucks using shovel. For this, the municipality has placed large waste containers on roadside so that people can throw the waste in it. However, people still behave carelessly and through waste outside the containers creating a pile of garbage on roadside. While sometimes the waste accumulated doesn't get picked up by the municipality for disposal which spreads bad smell and affects the public health. When asked about the issue to the municipal official and NGO

official both had a common thing to say, “*Most of the time reason for the accumulated waste going uncollected is obstruction by the residents living nearby the landfill site*” (Interview, 2016).

The quote above tells us about one of the most common issues developing countries deal with when it comes to waste disposal in landfill site i.e.(NIMBYISM). The municipality and private service providers collect the waste and dispose it into the landfill site in a daily basis in the absence of better infrastructure to store the waste at transfer station. With the disruption from the public at disposal site, it becomes difficult for the responsible bodies to collect and store the large amount of waste, so the waste goes uncollected deteriorating the aesthetics of the city.

#### *6.4.3.2 Waste collection through bell collection or door-to-door collection system*

It is one of the services of waste collection provided by both municipality and NGOs. LSMC has also introduced a bell collection system so that residents can throw their garbage into the collection truck themselves. In this method, people throw mixed waste in packs covered with plastic bags or in garbage bins. When the municipal vehicle arrives near the community route, it signals the people with a siren/bell, and the people throw the waste in the open type collection vehicles. The waste is being collected almost free of cost for the public. As the municipality does not directly charge the public for waste collection but they have been charging property tax and other taxes from the public to generate revenue. On the other hand, door-to-door collection is also practiced in many areas mostly by private companies or NGOs such as NEPSEMAC, WEPCO, and Sirjansil Batabaran Samrachan Kendra to name a few; for which they charge a collection service fee. According to SWM Act, formally, it is not allowed for private organizations or NGOs to charge for the collection services without the permission from the municipality but they are doing it anyways. Since there is no monitoring and regulation system present in the municipality that looks after the activities of private organizations and NGOs.

In some areas, the waste is collected quite well without littering while in some places, people did not care about the waste collection system and piled the waste on the ground. Generally, people tend to think waste management is purely a responsibility of municipality or the NGO in the area, which is true as municipalities have been collecting and transporting waste. However, waste management starts from the household level where people are responsible enough to store the waste properly and transfer/throw it in a designated place. Nevertheless, people do not follow this

path and throw waste wherever they see an open space or scatter it outside the collection containers. This makes the waste collection work harder for the people employed to perform the task and for the municipality as a whole. Due to this reason people, responsible for the collection have to invest more time in the collection of scattered waste in a situation where they are working in shifts and fixed time is allocated for a specific area.

On the other hand, municipality cannot reach the all the areas and private organizations are the ones who cover the inner areas with narrow roads and dense population. Waste collection charge of the private organizations/NGOs are based on the amount of waste generated by the households and organizations(Interview,2016).

#### *6.4.3.3 Inequality in collection services*

While the slum and squatter areas where the residents' capacity to pay for better services is less have often been ignored by the municipality. NGOs like NEPCEMAC and WEPCO have been collecting waste from these settlements and have initiated community composting in those areas. But still first instinct from these households has been to through the waste in river banks and open spaces in the vicinity.

#### *6.4.3.4 Limitations to collection services*

Door-to-door collection service provided by the municipality has been free of charge till now. There was a differential among the households, as the households in wards covered by municipality did not have to pay while wards covered by private organizations had to pay for the services provided. According to a municipality official from the new fiscal year municipality has plans to levy a service charge for the facility depending upon the area covered by the household in terms of square feet (Interview,2016). The municipality plans to charge for the service from the individual household in order to raise revenue from SWM services and make their services more effective.

#### *6.4.3.5 Waste Collection through street sweeping*

Street sweeping is one of the services provided by the municipality for waste management in the municipality. This is employed in the core areas as well as in the inner areas as a way to keep the city clean. There are 165 sweepers employed to sweep the core areas of the city twice a day and



other areas once a day. This includes 66 sweepers working for different wards, 26 helpers for loading waste on transport vehicles and 73 people for street cleaning(LSMC,2014).

However, during the field observation, it seemed that focus has been on keeping the core and city areas clean and still many inner areas are not given enough attention. Since the city square and nearby areas are tourist destinations, so the focus might be more on those areas rather than inner areas. They are also neglected due to the inefficiency and inadequacy present in the service resulting from lack of financial and human resources. Existing street sweeping practice is manual but it needs to be supplemented by mechanical broomer that will make the job more efficient. In addition, small vehicles like tippers and hand carts should be promoted that can help to collect the waste immediately in inner area after sweeping rather than waiting for the collection truck to arrive.

#### 6.4.3.6 Waste Collection efficiency in the municipality

ADB's report on Solid Waste Management Situation in Nepal shows the efficiency of waste collection system of LSMC to be 72 percent. The table below shows the total waste generation and collection in the municipality.

Municipality	Average HH waste (kg/day)	Total HH waste(tons /day)	Total Commercial Waste(tons/day)	Total MSW generation( tons/day)	Estimated Waste Collection(tons/day)	Collection Efficiency (%)
LSMC	0.90	42.15	36.80	85	60	72

Table 5: Total waste generation and collection in LSMC.

ADB,2013.

As per data provided by LSMC the amount of daily waste generation is 85 tons and all 85 tons of waste is collected by LSMC and private service providers. However, Asian Development Bank (ADB) in 2013 has revealed, that collection efficiency of the LSMC is 72%, which means only 60 tons of waste is collected daily. This overestimation in amount of waste collected is due to the lack of scientific recording system in the municipality. Field observation during the study also revealed that, a significant amount of uncollected waste was disposed haphazardly with practices like open burning or throwing the waste in surrounding open areas and riverbanks. This point to issues like

lack of sufficient awareness among public and coordination with private sector waste collectors. Along with issues like managerial and institutional weaknesses prevalent in the municipality which has led to low efficiency in waste collection.

#### 6.4.4 Tariffs

Private service providers/NGOs charge the household and institutions based on the amount of waste generated ranging from NPR (75-300). As a long-term plan municipality is also planning to charge waste generators with a minimum tariff of NPR.182, so that it generates revenue and help in upgrading the services. A survey conducted by the municipality in collaboration with World Bank revealed that the average willingness to pay for solid waste management services is NPR103.23 per month with significant standard deviation of 104.3. This implies that people are willing to pay for solid waste management services but there is dis-satisfaction due to gap in services (LSMC, 2016). Charging for waste management services is one of the strategic plans of the municipality to improve their services and make it more sustainable. It also has plans to apply polluters pay principle concept for the disposal of waste on open space, street and nature. The willingness to pay along with the possible charge is assessed in the table below.

S.N.	Category(NPR)	HH	Percentage %
1	<50	73	23.0
2	50-100	91	28.6
3	100-200	80	25.2
4	200-300	62	19.5
5	300-500	12	3.8
	Total	318	100%

Table 6: Willingness to pay by tariff slab and number of HH.

LSMC, 2016

The table below represents the main actors involved in SWM in LSMC. Along with their annual revenue generation from SWM activities.

Service Provider	Tariff revenue(NPR/year)	Recycling revenue(NPR/year)	Total revenue from SWM(NPR/year)	Cost Recovery (excluding recycling)	Cost recovery (including recycling)
LSMC	2,000,000	-	2,000,000	2%	2%
NEPCEMAC	20,880,000	1,200,000	22,080,000	102%	107%
Srijansil	5,600,000	1,800,000	7,400,000	77%	101%
WEPCO	2,400,000	300,000	2,700,000	103%	115%
Total	30,880,000	3,300,000	34,180,000	26%	29%

Table 7: Tariff collection and recycling revenues of largest service providers in LSMC.

LSMC, 2016

#### 6.4.5 Partnership with non-state actors in segregation, collection, transportation and disposal of solid waste

According to the environment engineer of LSMC, they have plans to develop clear contractual framework for public-private partnership in order to enter into the partnership with private service providers, since none of the service providers have been recognized by the municipality officially as stakeholders in SWM. They plan for compulsory licensing and registration of such service providers. Municipality has plans to facilitate the capacity building activities of the NGOs and the private service providers so that they can deliver better door-to-door collection combined with waste minimization waste segregation, composting and recycling as well as awareness building activities. Thus, it can be said that the municipality plans for a gradual shift in focus to ensure efficient and environmentally acceptable transfer and disposal and monitoring of collection service provided by the private actors.

#### 6.4.6 No Written Agreements with non-state actors

The officials of private organization/NGOs private operators were concerned that they have no written agreement with LSMC and no framework to report their operation system to the municipality. The reason for private service providers to enter into the solid waste management system can be associated with the actual demand for waste management observed in the municipality combined with the financial support they receive from donor agencies since solid waste management is an issue that needs immediate attention in Nepal. According to information provided by NGO during the field work, more than 4,000 are employed in solid waste management in the municipality, as non-state actors. Therefore, waste market is important for the state as well as non-state actors. On the other hand, an official agreement with the municipality is also necessary to legitimize and expand non-state actors 'activities.

Members of women's group had issues like, there is no framework for reporting on grievances of the consumers on the quality of services provided by the municipality and private sector. There is no official data and recordings about the number of households performing segregation of waste; based on the trainings provided by the municipality on source segregation and distribution of compost bins it is believed to be practiced approximately by 70 percent of household. The figure below shows the distribution of waste segregation bins to women's group.



*Figure 8: Distribution of Waste Segregation Bins to women's group*

LSMC,2016

One of the member of women's group participating actively in waste management activities says: *“Earlier -two years ago, they used the waste segregation bins as provided by the municipality; green one for the organic waste and red one for the inorganic waste. The vehicles responsible to collect biodegradable waste used to come every alternate day and the vehicle for the collection of non-biodegradable waste used to come every Saturday. Now the waste collection vehicles do not come regularly, so now the waste goes mixed from her house”.*

While asking about the same issue with the municipality official he said, *“lack of financial and human resources are the current challenges that the municipality faces and it is due to this reason waste collection has become less frequent”*

However, evidences from interactions and observations during field visit points out that municipality is focused on source segregation of the waste but they do not follow a strict guideline to collect segregated waste. Everything is done in ad-hoc way; segregated waste collected from the households practicing source segregation is again mixed during collection in transport vehicles. Few years ago, waste was collected separately. Vehicles collecting biodegradable waste used to come every other day and vehicles collecting non-biodegradable waste used to come on Saturdays. However, currently, same vehicle collects all kinds of waste, though households segregate the waste. When enquired about this situation, unavailability of vehicles and lack of enough financial resources to buy new vehicles that collect waste were pointed out by the municipality officials.

#### *6.4.6.1 Inconsistent Waste Recording System*

The waste recording system in the municipality is also not consistent in a sense that the volume assessment and the conversion to weight is encircled with doubts as the trucks can be partly filled and density varies considerably between the areas (LSMC,2016). While the collected waste is not subjected to weighing in the transfer station as they do not have a weighing machine designed for the purpose. While the weighing bridge in the landfill site was broken quite a while ago and not replaced yet.

#### 6.4.7 Transportation of Waste

Currently municipality do not have large vehicles so most of the waste is collected in small capacity vehicles. Waste is then taken to transfer station and then to landfill site in compactors(Interview,2016). All waste dumped along the roadside containers are swept, collected, and brought to the transfer station in tippers and tractors. The waste is then sorted out by scavengers and then taken to the landfill site for final dumping. According to the municipal officials LSMC plans to construct more environment and public health friendly transfer station in future (Interview,2016).

Transportation of MSW is carried out by vehicles of different size present in the municipality. When asked about the adequacy of the collection vehicles and staff, municipal officer said, “*number of vehicles are inadequate in the municipality, available vehicles must work many shifts,*” he also pointed out that they are short staffed and don’t have enough staff or vehicles to collect all the waste from so many areas on a daily basis as they used to do earlier. As pointed out by Sharholy, insufficient transportation causes some of the MSW to accumulate in the city once again after collection (Sharholy et al., 2008, p. 459). It was also observed that many vehicles used for transportation of MSW had outlived their normal life span, resulting in high fuel consumption, low efficiency and higher expenditure on repairs. Waste collection equipment of various capacities is currently used in LSMC are as follows:

S.N.	Type of equipment	Capacity (m <sup>3</sup> )	Number
1	Power tiller	2.3	2
2	Tipper/dump trucks	3.5	12
3	Secondary vehicles	15	4

Table 8:Types of equipment used by municipality for solid waste management.

LSMC,2014

In some areas, the waste is collected in daily basis whereas in some areas once a week or twice a week. Municipality cover the core areas of the municipality while the non-government

organizations cover the inner/fringe areas. The commercial and market areas are the ones where the vehicles collect in a daily basis. Municipality as well as NGOs do not have a proper recording and monitoring system for service delivery. They rely highly on the vehicle to check if the waste is collected or not and do not actually see if the vehicle is full, half or quarterly filled. Similarly, other method they use is recording the fuel consumption of the vehicle, which is not a reliable method to monitor the waste collection service. The collected waste is taken to the Balkhu transfer station where the segregation of waste is done.

#### *6.4.7.1 Lack of transportation vehicles?*

Power tiller, trucks and other smaller vehicles are in use for the transportation of collected waste. However, if mathematical calculation is considered, the vehicles currently used by the municipality for waste collection in total has a capacity to collect as much as 255 metric tons of solid waste per day if used in full capacity (see table: 8). While the waste generation of the municipality is 85 metric tons per day. This points out that the municipality is unable to use its resources optimally. One of the reasons for this was pointed out as lack of enough human resources and stigma associated with the job related to waste management. On the other hand, absence of a proper monitoring system in the municipality can also be blamed

During the field visit it was observed that many old vehicles are still at the transfer station of the municipality, occupying space. There some vehicles are worn out, while some can function after minor repair. But the municipality has not been able to fix the problem with the vehicles and relying on getting financial resources to purchase more vehicles. On the other hand, significant number of vehicles are provided to the municipality by the Government of India and Government of Japan. It provides an evidence that the municipality is lagging behind as an institution responsible for providing effective and efficient services to the public.

#### *6.4.8 Segregation and Transfer Station*

In Lalitpur Sub Metropolitan City one transfer station at Balkhu is used jointly with Kathmandu Metropolitan City. A transfer station is a centralized facility where waste is transferred from smaller vehicles to larger ones in order to facilitate the transportation to landfills or dumpsites,

since landfills and dumpsites often are located at some distance from the collection sites (ICIMOD and UNEP,2007, p. 127).

In the transfer station, recyclable materials are manually segregated from the collected waste, prior to transport of residuals to disposal at the Okharpauwa landfill site jointly operated by Kathmandu metropolitan city and Lalitpur sub metropolitan city, 33 km from the city. At the transfer station the waste remains overnight for sorting practice. *Kawadi* and informal waste workers segregate the plastic and other recyclable materials. When asked about the informal workers the municipality officials said “*We have approximately 26 people who do the segregation at the transfer station-they take 700-800kg of plastic from here. But we do not have records of where they take the plastic; probably to larger dealers*”.

These informal waste workers are collecting the plastic and other materials from the transfer station to the market, where they sell it to the dealers. Though this work is uncontrolled and unregulated by the municipality, it has helped reducing the waste which otherwise would have been disposed in the landfill site. In a situation where municipality is not being able to manage the resources properly, this job by the waste workers has helped to reduce waste transportation cost for the municipality; it might be the reason behind municipality not taking any action to end these practices where informal sector takes away the recyclable materials from the transfer station from which municipality could have otherwise generated revenue. The figure below shows the transfer station operated by one of the NGOs.





Figure 9: Transfer Station of an NGO.

NEPCEMAC,2016

#### 6.4.9 Informal Waste Workers

The Prism Project (Poverty Reduction of Informal Workers in Solid Waste) by Practical Action an NGO in close cooperation with all the municipalities in Kathmandu Valley identified 8,000 informal waste workers in total in the valley (PRISM Project / Practical Action and EU, 2014). Many are migrants from India and others are seasonal workers supplementing agricultural income. The informal sector includes waste pickers (street), waste segregators (in scrap centers), door-to-door collectors (with tricycle), dry waste buyers (feria with cycle) and small scrap owners (dealers). The project helped in providing membership cards, preventive health care training and establishing community resource centers for the informal workers. This was initiated by a non-government organization with the support from donor. Till now municipality has made no agreements to integrate the informal sector. The materials that they collect usually goes to the scrap dealers in the market.

On the other hand, main private organizations/NGOs working with LSMC have their own segregation and transfer station. They use their own vehicles for collection, transfer and disposal of waste. One of the organization NEPCEMAC has its own compost plant, compost generated

from this plant is sold commercially to local farmers and households. The segregation practice that takes place at the transfer station of the municipality and the private sector organization is manual in which they manually separate recyclables from the waste. The municipality and private service providers carry out manual separation of recyclables at their segregation and transfer facilities. The largest private service providers recover and recycle around 19 MT/day, which counts approximately 35% of collected volume through manual sorting. At the municipal transfer station the assessed recycling is 3 MT/day which counts approximately 5% of collected volume of waste (LSMC,2016) Both the government service provider and non-government service providers do not have a mechanical material recovery facility (MRF). *Kawadis* (scrap dealers) who are estimated to be approximately (115-120) in number in LSMC, collect and transfer waste from the community level to the recycling industries. Communities prefer selling wastes like metals, paper and glass bottles to the *kawadis*, since they get money for it and in turn *kawadis* sell it to recycling industries. Their economic activity is not monitored and regulated by the municipality. These *kawadis* are also the ones who receive the recyclable material from the informal waste workers active in the municipality. The table below shows the actors in solid waste management system in the municipality.

S.N.	Major Actors	Number
1	LSMC	1
2	NEPCEMAC (NGO/private organization)	1
3	Srijansil (NGO/ private organization)	1
4	WEPCO (NGO/ private organization)	1
4	Other NGOs in LSMC for SWM	11
5	Women's Group	180
	TOTAL	

Table 9: Actors involved in Solid Waste Management in the Municipality.

LSMC,2016

The non-government organizations in LSMC seem more efficient than the municipality in segregation and recycling activity. The waste sorted out by the NGOs also goes to the informal sector, as recycling activities in NGOs are limited to few selected materials like paper and plastic; thus, large portion of recyclable material goes to informal sector. Informal sector has a significant role to play in the recycling business, this has attracted a large number of waste workers in the municipality. Both municipality and NGOs are reliant on informal sector for waste segregation and recycling. Private organizations who are registered as NGOs though comparatively collect smaller amount of waste than the municipality are carrying out solid waste management activities in better way. It can be said that since the NGOs charge the waste generators they are more liable to the public to provide the services.

#### 6.4.10 Treatment and Disposal

##### 6.4.10.1 Existing formal solid waste recycling system

The municipality implemented an ambitious project Improvement of Solid Waste Management Practices in Lalitpur Sub-Metropolitan City for sustainable waste management with the support from European Union (EU) in 2014 with ward 22 and ward 13 as pilot wards. The project included household segregation, composting and reuse. Initially, it resulted in only limited need for residual waste collection. The project was also expanded in wards 9,16 ,21 and 18. But later, due to various resource constraints related to waste collection vehicles and human resources waste collection practice was more mixed than segregated.

Head of the environment section of the municipality states *“The project we implemented in these six wards are a success, we have also signed EU funded project which aims to provide 12,500 households with segregation bins and compost bins mainly through women’s group. The project also includes rooftop gardening, as well as three compost plants (3 MT/day each) and one biogas plant for slaughterhouse waste (½-1 MT/day out of a total of 2 MT/day)”*.

As an observer, the project appeared more of a success for the women’s group as they were practicing the source segregation, composting and roof top gardening as learned in the trainings. However, from the side of municipality, they seem to be not performing as targeted. They collect the segregated waste at household level in a mixed way.

Since, the collection of segregated waste is practiced partially as the waste gets mixed during the collection by the vehicles. Particularly, there is a need for introducing segregated waste collection in designated days which will improve the quality of waste collected. According to the municipality, collection services are provided in all current 30 wards by the LSMC in (11 wards) and by private service providers in (19 wards). This raises the issue of governance as the government haphazardly added new wards and VDC to the municipality, based only on the population criteria and not focusing on the infrastructure and revenue generation and municipal capacity. In a situation where municipality is not being able to provide services sufficiently to existing wards, addition of new wards creates further burden on them. There seemed a lack of coordination and consultation between the central government and local bodies in this issue which again raises the question about good governance practices in the country.

#### *6.4.10.2 Existing Solid Waste Disposal System*

Landfilling is one of the most common method used for municipal and hazardous waste in developing countries. It is a technique used to dispose solid waste in a specially engineered land to reduce health hazard and contamination but the method is not environmentally sound as it carries the risk of soil or ground water contamination. This method consists of compacted solid waste layers on the soil surface that are covered with soil layer ([www.incpn.org](http://www.incpn.org), Accessed February 2017). This method is applicable for non-recyclable as well as non-combustible waste. The waste collected by LSMC is finally disposed to Okharpauwa landfill site; an aerobic landfill site situated 33 km away from the main city. Disposal in Okharpauwa landfill started since 2005 A.D. Until the year 2000, LSMC used Gokarna Landfill site along with Kathmandu Metropolitan City to dispose the waste. However, due to agitation by the local waste disposal in Gokarna Landfill site stopped in 2000; and waste was disposed on the riverbanks and riverbeds until 2005. Okharpauwa landfill site was constructed in 2005 and started its operation in June 2005(Nyachhyon,2006).

Waste for disposal is transported to the Okharpauwa landfill operated jointly by Kathmandu and Lalitpur on a (80-20 percent) cost sharing basis. Kathmandu Metropolitan City (KMC) provides 80 percent of the cost for the operation of the landfill site and they are operating the landfill site,

as they are the largest waste generating municipality. Lalitpur Municipality is not actively operating the landfill site but they are providing waste loader, one operator, one sprayer and a driver in addition to cost sharing.

The 20 percent cost sharing for the landfill is based on the quantity of waste generated. At the beginning in 2005 A.D. when the municipalities started disposing the waste in the landfill site it was assumed that waste quantity is 60 MT/day from Lalitpur Metropolitan and 300 MT/day from Kathmandu Metropolitan. However, the SWMTSC waste delivery survey of October 2014 at Okharpauwa Landfill Site assessed the final waste disposal as 193.76 Ton/day, which is much less than the estimated figure (KMC, 2015).

Lalitpur Metropolitan is currently contributing 4-5 million NPR/year for landfill operation. According to LSMC there is no tipping fee at the landfill and both private operators and public operators can access and deliver waste directly to the landfill site for free.

However, private service providers had different thing to say. An official from the NGO currently working for solid waste management said, *“There vehicles are charged NPR 250 per vehicle when they enter the landfill site to dispose the waste, which they pay to the Kathmandu Metropolitan City since they are the major contributor for the operation of the landfill site”*.

It shows weak monitoring system in the municipality and lack of co-operation with another municipality. As opposed to how public institutions should perform so that they can adapt and collaborate with other actors to deliver better waste management services

Another situation that has aroused from this differential between public and private service providers is; many open dumping areas and wide waste burning is also seen in LSMC (LSMC, 2014 and Field Observation, 2016). The implication from this is there are no costs for the municipality vehicles to dispose the waste but when private organizations dispose the waste they have to pay. Because of introduction of fee in the landfill site, it seems like this has resulted into a situation where many of the private and non-state actor has started to dispose the waste illegally in open areas and riverbanks. As municipality does not have proper monitoring and regulation system for private service providers they are unable to control these activities as well.

At the same time, field Observation revealed that there is room for improvement of the design and operation of the LSMC segregation and transfer facility, as residual waste is stored overnight in the transfer vehicles or at the sorting facility, which may have a negative environmental effect on the nearby areas as well as on public health. Whereas at the landfill site there is no provision of material recovery or composting. It has been a long time since the operation of the landfill started. Initially it was designed for 3 years, later an estimated expansion of ten years was done due to unavailability of other sites. Currently a new landfill site, about 2 km from the current site is being done; till then waste will be disposed in Okharpauwa landfill site. The figure below shows the transfer station of the municipality and the landfill site.



*Figure 10: Municipal Transfer Station.*

*LSMC,2016*



*Figure 11: Okharpauwa Landfill Site.*

*KMC,2015*

## 6.5 Issue of NIMBYISM

With the increasing amount of solid waste and decreasing possibilities for proper disposal, issues like where to dispose the waste arises for the municipalities. When the municipalities reach a point on where to construct a solid waste facility and dispose solid waste, there usually erupts a tension between local residents, municipality and private sector organizations.

This also gives rise to the issue of NIMBYISM(not-in-my-backyard), refers to the situation when citizens demand for more public facilities, but they are unable to support the construction of these facilities, when these facilities are located near their home (Scicchitano and Johnson, 2012).

There are a number of reasons why locals oppose the siting of public facilities in their communities, which includes health concerns, decline in property values, and decline in quality of life due to traffic, noise, and other site-imposed externalities (Schively, 2007).

Issue of NIMBYISM has risen among the locals near the landfill site. Though the landfill site was constructed after Environment Impact Assessment (EIA) and designation of buffer zones, government has not been able to comply by the EIA regulations(KMC,2015). This has resulted in a situation where locals keep opposing the disposal of waste. They obstruct the disposal due to issues like; waste transport vehicles are damaging the highway, leakage from the vehicles are making locals ill and the vehicles have killed their cattle. They have even created local struggle committee, that negotiates with the government and municipal officials. Usually after struggle they settle for services such as free health services, drinking water supply and timely maintenance of roads. Waste disposal have been halted as much as 68-times in a year, this is also related to the issue of weak governance at local level resulted due to absence of local government who is responsible to hear local people's needs and demands. But looking at the trend of obstruction it seems that their obstruction sometimes is more driven by their demand for development rather than just an opposition of waste disposal in the landfill site.



## 6.6 Institutional Capacity Building of the actors

The inability of the municipality to construct a new landfill site provides insight to the fact that institutional capacity plays a crucial role in delivery of basic services to the public. There always has been an emphasis on the presence and the number of state institutions involved for a particular sector in Nepal rather than the quality and inter-relationship between the different institutions. For example, an institution can perform well, if they have strong presence in the sector through the implementation of good practices and good co-ordination with other institutions working in collaboration with them.

In the context of SWM in LSMC, there are a number of institutions like SWMTSC, LSMC and KMC involved in the process of designation, maintenance and construction of new landfill site. SWMTSC is the government body providing the consultancy services to the municipalities all over Nepal. Similarly, municipalities are local bodies responsible for providing basic services, which includes sustainable waste management services. Co-ordination and cooperation between these institutions is necessary for the success of new projects for solid waste management.

These institutions especially LSMC as the focus of the study, need to develop qualities essential to increase institutional capacity like performance, adaptability and stability; so that it meet the needs of its citizen.

**6.6.1 Performance:** LSMC needs to increase its performance by developing, formulating and implementing policies that are more relevant to the situation (e.g., by better analyzing the current SWM situation and formulating policies that emphasize the role of community based organizations and NGOs as they are producing optimistic results in waste management). LSMC, can strengthen units like community development unit, and planning and development unit responsible for community mobilization and infrastructure development work so that they can respond better to the policies and work accordingly. Also, co-ordination and co-operation between the different sections, with a clear mandate of roles and responsibilities can help in producing effective outcomes. The construction work of the new landfill site which is 2 km away from the current site

is going at a slow pace due to lack of clear distinction of roles and responsibilities among the responsible bodies like SWMTSC and the municipality. In this situation co-ordination between the responsible bodies along with the other stakeholders including the locals is necessary so that future problems related to landfill site can be avoided.

**6.6.2 Adaptability:** Institutional adaptability is a feature required in institutions so that they can continuously progress and redefine themselves in response to the changing veracities. Investment in innovations and technologies in order to produce better results and timely review of current policy and programs to figure out what works and what doesn't is a measure of increased adaptability. In the context of Nepal, this quality has a greater significance, as the country is going through the process of transition and there is a continuous change of government. In such scenario, government institutions like LSMC are required to develop capacity that help them adapt to the changing conditions. LSMC can deal with the issue of lack of sufficient human resources by increasing the capacity of the staff by providing trainings including development of policies that fits the need of the changing time. The municipality is currently struggling to collect waste in an efficient manner due to lack of human resources in addition to lack of vehicles. In this situation capacity building of existing human resources by provision of proper trainings and equipment can work in their favor. On the other hand, it can adapt the concept of multi-level governance in its strategies and policies to recognize the contribution of all the formal and informal service providers present in the SWM system. So that non-state actors get recognition, expand their activities and support the municipality. Therefore, collaboration between all the stakeholders in the municipality becomes possible, leading to better SWM services to the public.

**6.6.3 Stability:** It is a feature that is required in institutions so that they can perform in the long run integrating good practices and policies. It is evident that SWM practices in LSMC are not always performed according to the standard procedures and regulations; there are deviations repeatedly. In case of formalization of collaboration with private actors, legalization of tariff and waste handling and disposal practices. Not much has been done by other institutions including LSMC concerning the environmental issues of landfill site, whereas it is clearly mentioned in SWM technical guideline. On the other hand, no measures have been initiated to improve transparency and accountability of LSMC. Particularly in relation to the variable performance in SWM between

the government service providers. This may be due to the influence of political change in the state leading to change in institutional leadership in government bodies whereas private actors are not affected by this sudden change. These qualities are responsible for ensuring that the available assets and resources are used as efficiently and effectively as possible.

Experiences during the field work provides evidence that municipality has not been able to keep proper documentation of various waste management activities. A lot of ambiguities existed about the actual amount of waste generated and collected in the municipality. Records were kept manually in written form which can be damaged easily by water or fire, no electronic record keeping system existed in the municipality. While the environment section, handling the SWM activities was short staffed, numerous activities were performed by the same person.

Thus, for the municipality to progress further and provide better services needs to have a proper documentation and record keeping system, increment in the competency of its staff ,especially hiring people with skill required for solid waste management, development of a knowledge-sharing mechanism to share good practices of other municipalities, designing and implementing participation mechanism for private actors formally into the SWM and developing information management system to ensure it simplifies the decision-making process. As municipality is an institution at local level and a key system on which the state relies to fulfil its obligations towards its citizens (Resilience, 2011).

Looking at the situation from macro level in national perspective, for these institutions to function effectively and meet up the public expectation, the state must also give priority to these institutions irrespective of the fact which party is ruling the government. The state, in the current context Government of Nepal must focus on strengthening the local governments and local bodies responsible for delivering basic social services. Literature from other developing countries also point out that formulation, implementation along with monitoring and evaluation of policies and programs is critical for the success of any development initiative(DES,2013). Achievement of this objective fundamentally relies on the continuous availability of experienced and well-trained staff in key government institutions and government bodies such as ministries of finance, planning and development (Nelson, 1990) as cited in (Leftwich,1993).

## 6.7 Collaboration with Informal actors

There is also the issue of *kawadis*, informal waste collectors; as a large bulk of recyclable waste from the community is collected by them and sold to the recycling industries. This goes unnoticed and unregulated by the municipality; the municipality and NGOs are unable to address and keep record of this informal sector that has a direct effect on municipal solid waste management system. For the integration of informal sector into the SWM system LSMC needs to develop programs that create a favorable environment for their participation. The municipality has not been able fully work on the inclusion of informal waste workers, their situation is destitute without provision of safety trainings and equipment. The interim constitution of Nepal 2006, has several provisions concerning labor issues which serves as the foundation for labor rights in the country. These laws restrict from any form of slavery and forced labor; freedom of assembly, association and speech; freedom of trade, business, and profession; right of equality, promotion of social justice and economic well-being of the people. But there is no special provision related to informal waste workers.

However, LSMC is not able to recognize the contribution of these informal waste workers and *kawadi* in public health and sanitation as they are the ones who remove waste from urban areas not served by municipality and private actors. Along with it these informal waste workers, *kawadi* are helping to reduce the municipal expense through segregating the waste at the transfer station or buying it from the public. There is a need for the development of regulations and act that addresses the issues of informal waste workers. Municipality needs to recognize the contribution of the informal sector to solid waste management and treat them as one essential stakeholder in SWM system. Whereas, in order to involve the informal, sector a public private partnership model needs to be developed; such that the private actors, informal sector and the municipality work together. The government of Nepal has a public private partnership policy and guideline (2004/5) but its implementation has not become a reality yet which again points out to the presence of weak governance in the state. The government has not been able to make the policy adaptable to the changing context and bridge the gap and build trust with the non-state actors. As PPP should be with the provision of resource and risk sharing so that all the parties involved are responsible towards their roles and responsibilities. Adoption of this participatory approach by the

municipality will help to deliver better services leading to strengthening of municipal solid waste management system.

### 6.8 Public Private Partnership and Multi-Stakeholder Governance

For the government and municipality to develop a PPP model there is a need for the adoption of multi-stakeholder governance which will facilitate process of cross-sectoral partnership. The concept will help to recognize the contribution made by other stakeholder present in the waste management sector. Multi-stakeholder governance concept provides a platform for all the stakeholders to discuss the political, economic and social issues. Whereas, placing positive governance practices under the multi-stakeholder concept has created prospects for establishing new forms of co-operation and collaboration between different stakeholders working together to achieve the common objective as set out by the policy (Thomas and Grindle, 1990). The figure below shows the classification of different stakeholders in solid waste management in the municipality, identified during the fieldwork.

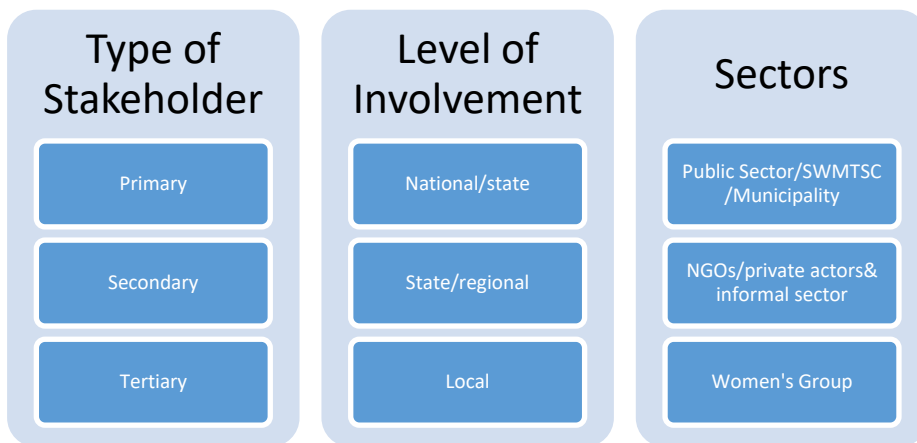


Figure 12: Classification of stakeholders into different group in SWM.

Modified for LSMC (World Bank, 1995).

Stakeholders in solid waste management can be divided into three groups, which are primary, secondary and tertiary stakeholders (Abas and Wee,2014). As identified by the field observation primary stakeholder in the study area is referred to actors that are responsible for policy formulation and implementation such as ministries of government of Nepal and its agencies like solid waste management technical support center(SWMTSC) and local bodies including the

municipality. Whereas secondary stakeholders are the ones that participate in policies implementation such as private service providers, NGOs and informal sector in LSMC are the ones that abide by the laws and regulations. At the same time, they are involved in waste collection, transportation and final disposal of waste in LSMC. Additionally, tertiary stakeholders are the ones that comply by the laws and policies such as women's group and other CBOs who have closer relationship with the public and can play a vital role to contribute for the greater good of the society. (World Bank, 1995).

Multi-stakeholder's governance principle has four essential elements such as participation, openness, cooperation/collaboration and pluralism (Thomas and Grindle, 1990) as cited in (Abas and Wee,2014). For the implementation of solid waste management policies participation, collaboration, openness and pluralism is necessary (Abas and Wee,2014). Participation and collaboration between the various stakeholders identified can help them to overcome the constraints that they are facing. They can take advantage of the resources available to each other and work towards achieving their common objective of better waste management services in the municipality. Whereas for collaboration and participation to yield desired results there is a need for openness and pluralism in regulations and policies related to SWM,so that the stakeholders can act together. In reality, it is believed that openness and pluralism are achievable whereas collaboration and participation are difficult to accomplish as it might be difficult to bring all the stakeholders to a common ground and work together. But researchers argue that, motivation is a key to generate the collaboration and participation of the various level of stakeholders (Elbakidze,Angelstam,Sandstrom and Axelsson, 2010). The figure below shows the essential elements of multi-stakeholder governance.

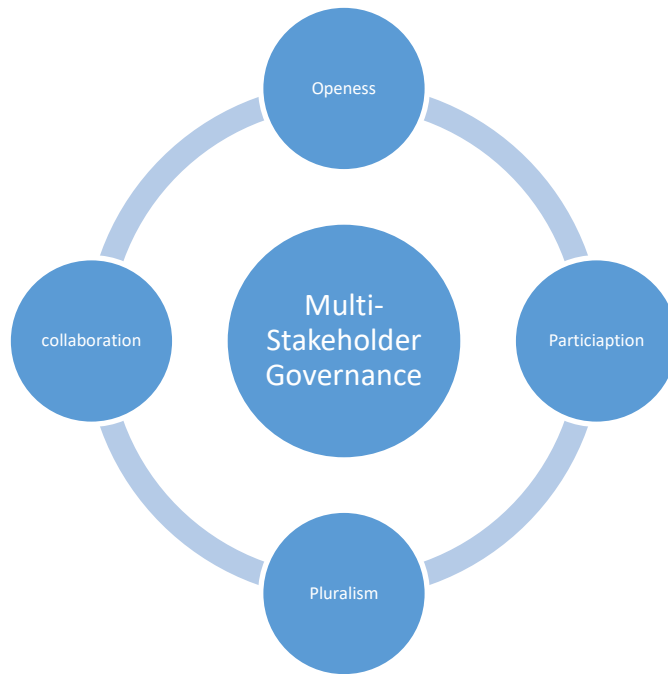


Figure 13: Essential elements in multi-stakeholder governance.

Thomas and Grindle, 1990 as cited in (Abas and Wee, 2014).

As identified by the field study; after interviews with the government officials, private service providers and women's group and literature review of the status of informal waste workers in the municipality. It becomes clear that in LSMC, all the stakeholders involved in SWM have a motivation to participate in PPP model and achieve the goal of delivering efficient solid waste management services.

In the study area, the municipality has not been able to deliver proper solid waste management services to the public; the private actors are working on their own and have not been recognized formally according to regulations, while they are performing significantly better than municipality; women's group as a part of community are working with the municipality successfully but their work and achievement haven't been capitalized by the municipality and they haven't become fully sustainable yet; they rely on municipality for the trainings and waste management equipment. Nevertheless, involvement of women's group as CBOs becomes important in PPP model so that they can maintain the check and balance in the system.

On the other hand, the informal sector is contributing to the waste management system through recycling activities are highly vulnerable to several types of risks and haven't been recognized for the contribution they make in waste reduction. Every actor involved in the SWM process is dealing

with a number of social, economic and political issues. In this scenario, formalization and acknowledgment of the existence of the different stakeholders in SWM system of the municipality is necessary so that public private partnership can be adopted to ensure sustainability in solid waste management.

## 6.9 Implementation of PPP

The tariff charged by the private service providers is as mentioned in section 5 is unregulated and no reporting on revenue collection takes place. On the other hand, survey conducted by LSMC shows public is willing to pay for the services, if the services are satisfactory. Thus, LSMC has introduced tariff charge to households and businesses from fiscal Year 2015-16 through an Integrated Property and Service Charge System(LSMC,2016).

However, the new tariff system does not seem feasible as it is considered to be charging double in the areas outside the core areas where waste generators are already paying to the private organization/NGOs for service provision. Though SWM Act 2011, provides a clear guideline for service charge; municipality can fix a service charge for the waste management services and it can allow other actors to charge tariff based on the quantity and nature of solid waste. Nevertheless, there exists a gap between the law and practices at ground level (Agamuthu, Hamid and Khidzir, 2009). The problem of futile policy implementation has occurred in SWM system in Nepal. This problem is also reflected from the poor functioning as well as the governance of the stakeholders primarily the public sector, which creates a barrier for the PPP model to get implemented in future as planned by the municipality.

Thus, the municipality is required improve its governing practices; implement the existing regulation so that collaboration and co-ordination with the private sector becomes easier. Such that all existing issues related to service charge can be resolved. Meanwhile the government needs to create conducive environment for the private sector to come into agreement for PPP model. A secure environment with trust and confidence among the parties involved needs to be developed, so that the private sector is not afraid to invest their resources. At the same time, clear definition of roles and responsibilities with a road map for future activities is required with fair share of risks and benefits in the collaboration.



## 6.10 Women's Group Participation in Household Waste Management

Women's group is discussed below as an example how community based organizations can work for solid waste management where state institutions are not being able to produce desired results.

### 6.10.1 Formation of Women's Group

Involvement of citizens in decision making especially at the local level has been adopted widely by the governments in developing countries including Nepal. But the goal of such an initiative may vary greatly but the driving force and cohesive factor is to improve the ways in which ordinary people can effectively participate in and influence policies which directly affect their livelihood (Smith, 2005).

The culture of women gathering in their free time and sharing information is not new in Nepal. Women in a community have been gathering, sharing stories and even helping each other out economically. In the context of study area, which predominantly is home to Newars, the ethnic community of Kathmandu valley. They have a long-rooted history of *guthi* a socio- economic organization to help each other in the community. As Newar society is one of the strongest patriarchal society in the country and women have very passive role to play in Guthi organizations. They just support the organization that their father or husband is part of. They did not have specific group or organization to work. Informally, women from specific wards were gathering at a common place and working without any proper supervision. Then, the municipality's community development section intervened and convinced women to organize themselves more systematically. Recognition as women's group came in 1999, when two women's group were formed by the initiation of municipality and registered officially. In the beginning, municipality focused in providing capacity building training to the women's group providing them leadership, report writing and group management training. Especially women's group activities are more widespread and generating better results in LSMC possibly due to the dominance of one ethnic group sharing same culture, language and practices. Since its formation, the number of women's group in the municipality has increased year by year.

Currently, there are altogether 180 women's group registered in the municipality. The social welfare division of the municipality conducts training program for women's group. These trainings

are related to anchoring, report writing, accounting, leadership and shifted to source segregation of waste, rooftop gardening and composting as the issue of solid waste management became rampant. While private service providers NGOs such as NEPCEMAC and WEPCO are providing training to the women's group not covered by the municipality. They give training for household composting, source segregation, rooftop gardening, recycle and reuse. These trainings have been provided to women's group of 11-wards of the municipality namely wards (2,3,4,5,13,15,16,18,19, 21 and 22). Waste segregation training is for one day, composting and roof top gardening is for 3 days and recycle and reuse is for seven days. In each training on average 40-50, women from different groups are provided training.

#### 6.10.2 Obstacles/Weakness of community development section of the Municipality

The coordinating officer at the community development section responsible for the trainings provided by the municipality had few things to say about the training *“We have been providing capacity building training to women's group since last ten years, earlier these trainings were funded by the Lalitpur municipality itself, but two years ago, we started receiving support from European Union. Along with the trainings we have been providing materials like waste segregation buckets for free and compost bin at a reduced price”*.

Municipality officials are quite satisfied with the work they are doing with the women's group. They have been providing trainings to women's group for more than a decade now. Earlier, it used to be just training but now its training with occasional field visit and distribution of additional materials related to trainings. With the financial support from EU, their trainings to women's group has become expansive.

While one the municipality official was concerned about the lack of enough human resources in the community development section which provides trainings to the women's group, especially for record keeping *“we do not have enough people to keep the records, if you want information you need to wait as we do not have documents currently here, it is somewhere in the store room”*. At the same time, municipality's community development section working with women's group is dealing with the issue of lack of human resources. This became evident when it became difficult

even for them to provide me information about the number of women's group active in the municipality and the type of trainings received by each of them. The issue of lack of transparency in the municipality offices were clearly visible.

They were not clear about the number of women's group till the end and were unsure about the information related to quantity of materials provided to the groups after training. Their reluctance to provide me information implies that municipality as an institution lacked in transparency in issues related to finance. While they were willing to provide information on their future plans and processes but were mostly tight-lipped on financial matters. This generates some skepticism about the issue of corruption in the municipality. As corruption is one issue that administrations in developing countries are fighting to eradicate.

NGOs in the municipality working in waste management such as NEPCEMAC are also providing waste management training to the women's group in the municipality. They are covering women's group in wards (2,3,4,5,13,14,15,19 and 20). They are providing waste segregation, composting and roof top gardening training. The figure below shows women's group after recycling and reuse training



Figure 14: Recycle and Reuse training to women's group.

LSMC,2016

According to the research and development officer of an NGO actively participating in SWM “*We cover Kathmandu Municipality and Lalitpur Municipality which includes 19 thousand households for waste management activities whereas he says they have trained 2,000 women in Lalitpur municipality alone*”.

Both municipality and NGOs have been providing trainings to the women’s group. The role of women in sustainable waste management is pivotal since they are quite evidently directly concerned with waste management at household level. But the trainings provided to women’s group is of smaller scale as compared to the population and number of households in the municipality. Despite the consistent efforts to integrate gender concerns and perspectives in policies and programs for sustainable development, it had not been implemented especially in developing countries. But the municipality has set an example by doing a commendable job of mobilizing community based organization (women’s group) to assist in the solid waste management.

Nevertheless, there still exists issues related to women’s group being considered as an outsider when it comes to be a part of decision making process. Their involvement in waste management is often limited to household and community level. They have not yet been a part of decision making process where they have their say about what are the shortcomings of the current system and how can it be improved. Since, they are also on the receiving end of waste management services as citizens.

In this context, one of the official of the SWMTSC said: “*capacity building trainings provided to women’s group by the community development section of the municipality is not sufficient to manage solid waste. It might seem useful for short term but in the long run it is not a sustainable method. As the municipality is one of the most urban areas of the country, mobilization of women’s group to get long term results in waste management might not produce desired result*”.

The government official’s perspective in relation to women’s group involvement in solid waste management is guided by his view; to improve waste management services in the municipality there is a need in the improvement in the governance and capacity of institutions dealing with

SWM. Women's group are doing a decent job at grass root level but just providing trainings to women's group is not enough and sustainable solution for waste management in the municipality.

#### 6.10.3 Perspective of the members of women's group

The members of women's group also think that being in the women's group has helped them to become more aware about the issues that their municipality is facing and work from their side to better the situation.

President of one of the women's group which was awarded the best women's group a year ago said *"It is good to be in the women's group, in our ward we have more than 15 women's group but we are the ones who are more organized and active. Involvement in the women's group has made us realize that, though our organization is small we can still contribute to the community"*

*While member of another women's group was a bit unhappy with the treatment they received from the municipality, "We do not get called for all the trainings and activities conducted by the municipality, they only call people who are near to them, because of this we have missed so many useful trainings"*

It shows that women are eager to participate and learn about the waste management practices at household level. However, they face obstacles related to their sustainability as well as time management. Women's group are not still fully sustainable, they have to depend on municipality and NGOs for trainings in order to increase their capacity according to the changing methods and practices of SWM. Moreover, women's group have not been able to practice solid waste management activities at community level in a larger scale, mainly due to lack of enough resources. Thus, organization of women to form women's group and mobilizing them for waste management activities is a creditable job from the side of the municipality.

#### 6.10.4 Women's Group Participation through CLEAR MODEL

In this section, I am analyzing the interest of the women to be a part of women's group and their eagerness to participate in the waste management activities with the help of CLEAR model forwarded by (Lowndes, Pratchett and Gerry Stoker, 2006a). I have chosen this model as it helps to identify citizen's irregular response to participation and it also argues that participation is most

effective if citizens can do, like to, enabled to, asked to, and responded to (Ndum,2013). This model becomes relevant in the context of LSMC since it helps each municipality to identify the strengths and weaknesses of their own public participation initiatives and existing practices. After evaluating current practices with the model; it will help me to generate recommendations for the municipality so that it can improve participation and set priorities for further improvement. The figure below shows application of CLEAR framework to women’s group in the municipality.

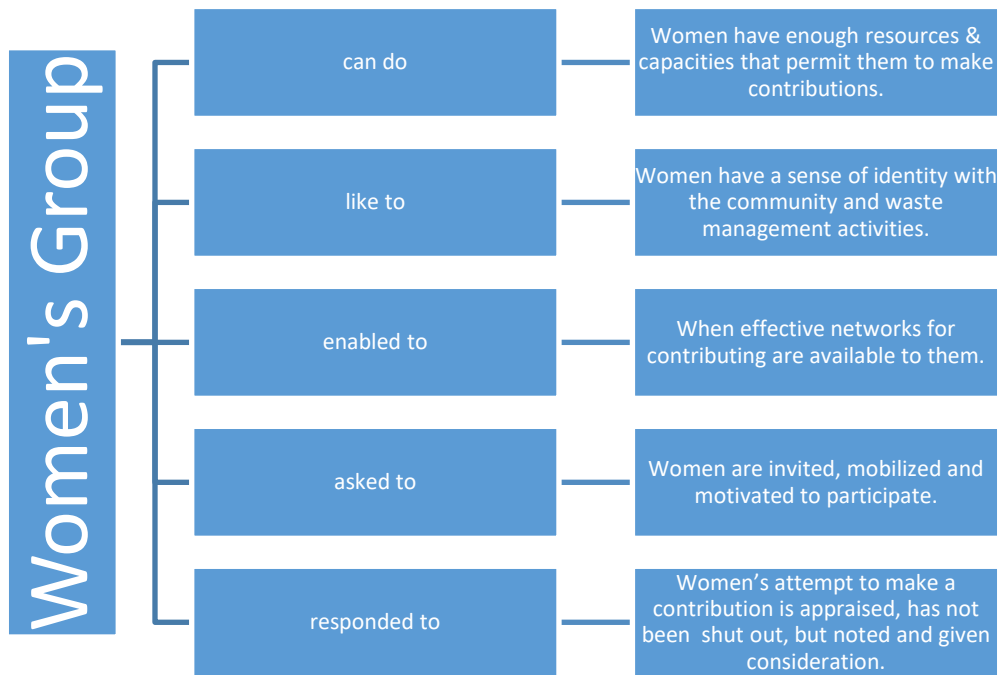


Figure 15: Application of CLEAR framework to Women’s Group Participation in Solid Waste Management at Household level.

Ndum,2013

### 6.10.5 Describing Women’s Group Participation with the help of CLEAR framework

#### 6.10.5.1 Can do

It is based on the argument that when people have a good socio- economic status they can participate. However, they also need to have appropriate skills required for to support the initiative. In case of women’s group participation in solid waste management, appropriate trainings in waste management activities have developed skills in them to be a part of the initiative.

#### *6.10.5.2 Like To*

It is based on the idea that people when feel that they are a part of something; they are more encouraged to engage. As put forward by Putnam, it can be linked to social capital, where people have a sense of trust and network; such that they are willing to work together effectively and cooperatively (Putnam, 2002). During the interviews with women's group members it became apparent that they liked to be a part of the group and eager to contribute. They tried to come to their office; meet and discuss with each other every day when possible. Improve the activities that they conduct at community level, such as increasing the production of compost from the community compost or sharpen their skills at reusing plastic bags and jute to make household stuffs like tea mat and basket.

#### *6.10.5.3 Enabled To*

Most participation is enabled through groups or organizations. The presence of networks and groups which can foster participation and which can deliver a route in to decision-makers is vital to maintain the vibrancy of participation (Parry, Moyser and Day,1992). The municipality has also tried to encourage public participation in solid waste management through engagement of women's group. Municipality here has tried to mobilize the existing disintegrated group to come together for a common objective. They seem to have succeeded in doing so. During the interviews and discussion members of women's group communicated that they enjoy being part of the group; they also get to learn new things in a friendly environment. The trainings they receive makes them feel that they are utilizing their time for productive activity which otherwise would have been wasted, if they were not a part of the group.

#### *6.10.5.4 Asked To*

It is based on the research findings that mobilization is important for participation to produce expected outcomes. the extent of openness of political and managerial system in the state has a significant role to play. As the degree of participation increases with the increase in variety of opportunities provided to the public. Here women's group are provided with opportunities to be a part of wide array of training programs and field visits that has helped in their empowerment process.

#### *6.10.5.5 Responded To*

It is based on the idea that when people have confidence that their contribution is influencing change and attaining positive benefits, their participation becomes sustainable. It implies that for people to participate actively they should believe that they are going to be listened to and, if not always agreed with, at least able to see that their views are taken into consideration (Ndum, 2013). Women's group are recognized for their contribution in SWM by the municipality every year. They are given best women's group award based on their performance in waste management activities.

#### *6.10.5.6 Women's Group and Good Enough Governance?*

With the help of CLEAR framework, we can imply that women's group when provided with opportunity for participation and are mobilized through public organizations, can provide effective waste management services. This will help them be a part of local development projects and give them confidence and a sense of empowerment for further activities. While as an outcome of women participation, social cohesion will increase and eventually help to promote unity in the community. The success of women's group in taking up the opportunity and utilizing it for the development work can provide inspiration to others.

Women's group and municipality both are benefitting from this collaboration. Through women's group, women have got a sense of belonging, which was not possible earlier. Similarly, municipality as an institution is mobilizing community organization for the greater good of the society. This initiative of municipality can also be related to the concept of 'good enough governance' where municipality can focus on what is working for them at grassroot level (i.e. mobilization of community) for solid waste management activities at household level; rather than focusing on macro level indicators of governance which will take a considerable amount of time to achieve. Achievement of these good governance indicators will depend not just in the efforts of the municipality alone but on the social, political, economic and cultural setting in the country; also, many other external factors like influence of international organizations and neighboring states that affect the social, economic and political situation. These factors are important to keep in mind as development initiatives in Nepal has highly been influenced by the donor agencies and neighboring states in the past.



## 6.10.6 Success Story

### **Karunamaya Mahila Samuha, Ward-19**

*Gita Bajracharya, secretary of Karunamaya Women's Group*

*Our group was established and registered in community development section of the municipality in 2012, we have 30-35 members in our group. We started getting trainings from the municipality from 2013. At first, we received trainings related to accounting and record keeping and leadership. Later, in 2015/2016 we received solid waste management training. We have received waste segregation, rooftop gardening and composting training. Each of us have received waste segregation bins from the municipality and nearly everyone has the compost bin as well. With the trainings they received seeds for vegetables, insecticide, compost and measuring jug. The trainings have helped more than 50 households in the ward. Every member of our group practices waste segregation and we are also doing roof top gardening, using the compost made from the compost-bins provided. We produce vegetables like spinach, tomato and gourd.*

*We liked the concept of compost bin so much that we got a large compost bin from the municipality at a reduced price. This compost bin is placed at a common park type of area where the women from the nearby households bring the organic waste to make the compost. We have started selling the compost at NPR.30 per kg, we sell this to households and nurseries.*

*While on the other hand we are also collecting plastics and glass bottles and go and sell it to other women's group who is responsible for collecting plastics and glasses. Households involved in our women's group produce small amount of waste and this goes to the truck that comes to collect the waste. Being in the women's group has helped us a lot, we have learnt to manage waste. Along with it we have been able to disseminate information to people we know about our knowledge. This has increased awareness among others as well. We now can produce organic vegetables in our own house and the amount of waste we generate has decreased significantly.*

Box 1: Success Story

Interview,2016

#### 6.10.7 Analyzing the success of women's group with the help of CLEAR framework and institutional capacity

The above example illustrates the success of a women's group. The group is able to utilize trainings provided by the municipality and produce positive results. Looking at the success of the group from the perspective of an institution working at the grass root level it can be said that; it is following the principles of good governance and have the essential institutional qualities required in the context of Nepal.

Applying the CLEAR framework to the women's group, it can be said that, they developed capacity required for efficient waste management through the trainings provided to them. On the other hand, as an individual they like the idea of being in a group as it gives them a sense of belonging and offer network. Being a part of the group they are able to help each other economically through the establishment of fund in the time of need. They are utilizing the network they developed through women's group to commercialize their compost production. Similarly, the yearly award distribution based on the performance in waste management activities has been useful in encouraging them to perform better.

On the other hand, as a micro level institution over time, it can be said that they have developed qualities like stability, adaptability and better performance. Established in 2012, initially they were focused just receiving trainings related to leadership, cooking and embroidery. Later, they adapted with the need of time and started focusing in solid waste management, as proper SWM started to become an issue for the municipality as well. This shift in focus provided them capacity-building opportunities in form of several types of trainings. Now it has led to a path, where they can become stable economically overtime through commercial activities like selling compost manure. They are moving with a future plan to request for vermi-compost training by the municipality. On the other hand, they had plans to get training related to reuse of plastic in few months from the municipality so that, they can improve their performance and be an award winner in future.

Thus, the success of Karuna Maya Mahila Samuha is helpful to understand that participation can be successful if people are organized and have a definite structure. In addition, capacity and resources of the participating population plays a significant role to get expected outcome. Above

all enthusiasm and a feeling that they are participating for the greater good of the society is essential.

### 6.11 The Central Government and Municipal Solid Waste Management Relationship

The legal officer of Solid Waste Management Technical Support Center (SWMTSC) a government body responsible to support the local bodies for solid waste management was not satisfied by the current local governance system, *“Locals in the landfill protest time and again, this has hampered waste disposal several times, in the past we had to shut down the landfill site. It has become a regular process, this is mainly due to the lack of elected bodies in the municipality that disposes the waste and in the VDC where the landfill site is located. We are not being able to solve this problem, since the public demands are motivated by political motive and the presence of APM has not been that helpful as they are more accountable to their respective parties, usually after negotiation with the locals, they settle on development work (like road construction) though in the beginning their demands are related to health and environment”*.

It implies that the VDC where the landfill site is located is in a need of development like roads, hospitals and drinking water that can improve their living standard. As people are devoid of such facilities, it has become easy for the political parties to use people to fulfill their motives. This leads to the issue of weak governance in the state and not enough focus on development of basic infrastructures required for the day to day functioning of public.

In the same issue, head of the environment section of the municipality said *“The issue of landfill site and blockage by public has been affecting waste disposal for a while now. As a solution to this problem we are soon implementing Output Based Aid (OBA) for municipal solid waste management, to improve access better quality and sustainable waste management services through the provision of a performance based service delivery subsidy to support the gradual improvement in the cost recovery in line with the improvement in service quality”*.

The municipality itself wants to replace the present practice of solid waste management that involves street sweeping, collection, transportation, disposal by a more resource oriented and sustainable practice involving reduce, recycle and reuse. But it is not easy for them as a culture of reliance on donors to fulfill the gap of lack of resources exists in the country; tied with the issue

of weak governance and haphazard decision making like change in local governance structure by the government without enough research and consultation with the local bodies.

### 6.12 Decentralization and Governance

The central and local governing bodies' relationship has an important insinuation in the governance of municipal solid waste management in terms of implementation of laws and policies related to waste management and allocation of financial resources. It is here where decentralization of power from the central governments to local authorities and within local authorities themselves becomes viable (Bossert, 1998).

As a process of decentralization, municipalities were given responsibility to provide waste management services in Nepal. As a local governing body municipality carries out its activities implementing the public policy decisions made by the government. In this process, it interacts with the public sector, private sector and civil society organizations. These relationships between different sectors determine the power relations, how things are done and how the services are provided. This demand for the system of governance, in which services are planned, managed and structured within the social, economic and political structure. For this, the system need to have principles of good governance which is able to improve the administration and public service delivery.

For this, they need to have features of participation, be transparent, accountable, follow rule of law to provide effective and efficient services. Municipality on the other hand as an institution responsible for providing waste management services is required to have institutional qualities that support better service provision. A clear definition of roles and responsibilities is required in the municipality,

Quality of governance affects the overall performance and capacity of the administrative institutions which is in turn affected by the political situation rather than the type of political regime. With the improvement in governance at macro level it automatically will enable the local government institutions like municipalities to improve their quality as a responsible body at local level, so that the public service delivery system is improved and the citizens get better solid waste management services.

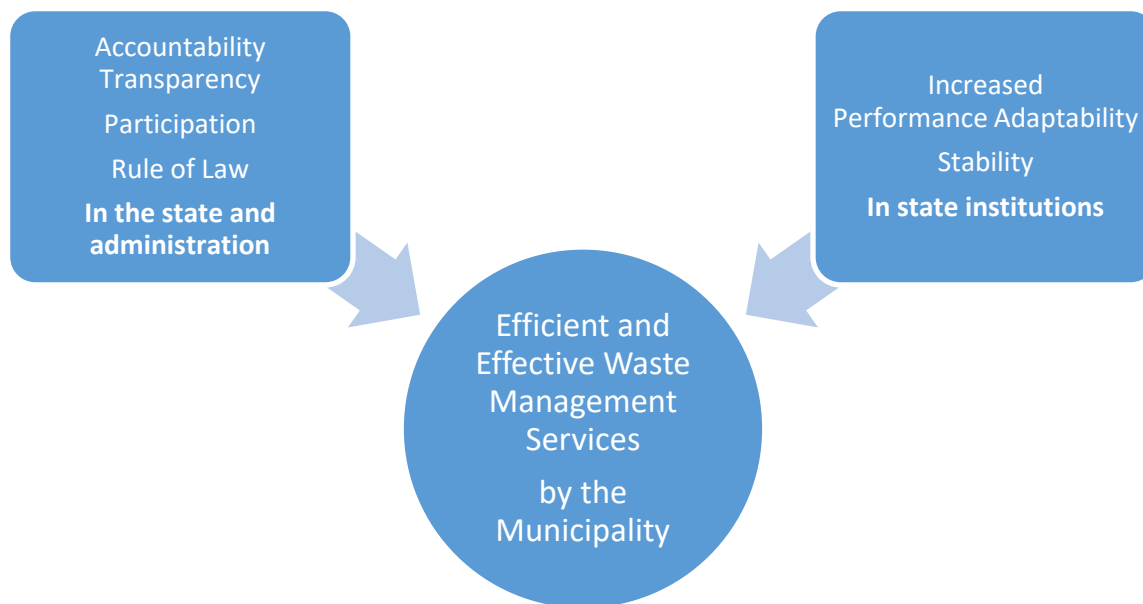


Figure 16: Relationship between Governance Principles and Institutional Qualities in the context of Waste Management in the municipality.

Author, 2017

The above figure indicates the relationship between the governance principles and institutional qualities that is required so that the municipality as a responsible local body to be able to provide efficient and effective waste management services to the public.

Local bodies in the context of Nepal are given power to run independently but proper functioning of LBs ultimately relies on the governance in Ministries of Local and Urban Development and SWMTSC. These ministries along with SWMTSC are a part of the central government responsible towards LBs in terms of policy formulation, consultation, budget allocation, designation/classification of an area into village development committee or municipality based on infrastructure and revenue generation. However, the elected bodies at local level decide on the resource distribution to different sectors. Due to the absence of these representatives, government officials designated by central government bodies run the LBs.

However, these officials might not be as responsible to the public as the elected bodies would have been. Past experiences in developing countries have shown that civil servants and their accountability can be deviated vertically upward towards the officials above them if they see a benefit; than to the needs and demands of the public. From this we can conclude that there is a need of good governing practices at the uppermost level of government will lead to better practices at lower level government bodies.

Similarly, for the SWM system to function properly a clear definition of role and responsibilities, updated policies, strategies and directives on SWM is required. Followed by adequate and efficient management tools, as well as monitoring and follow-up mechanism is also essential. However, for all this to be in place municipality needs to be supported and guided by government that has adapted accountability, transparency, rule of law as its principle. This situation in government will reflect directly into the state institutions responsible to deliver basic services to the public. Institutions overtime develop qualities like performance, adaptability and stability essential for producing expected outcomes. As the state institutions have directives and support from a stable government following the principles of good governance they can focus on activities that help them to address public need and demand for better services.

### 6.13 Summary of the chapter

From the analysis and discussion of the current situation of solid waste management in the municipality it appears that, the municipality is lagging behind in most of the areas required to provide adequate services to the public and the initiatives taken by them are limited to women's group participation. Other plans related to improving the SWM services are restricted mostly in papers. It has been more than three decades since the first solid waste management project (Solid Waste Management Project 1980-1993) entered the municipality; still there has not been any commendable changes in the system. Reliance on donor and aid agencies, inability to effectively implement laws /regulations and programs related to SWM, high political influence on waste management, weak performance in public institutions shows the failure of governance in waste management in Nepal.

Thus, for the municipality to move towards a better condition in order to give effective and efficient service delivery; there is a need of organizational/institutional accountability, transparency in decision making, adaptation of rule of law and participation in formulation and implementation of decisions. At the same time, improvement of governance at macro level as well as at micro level is necessary for the decentralization to be effective. One of the core aspect of decentralization is political decentralization, where political authority is transferred to local level. However, in case of Nepal though legislations exist decentralization in its true sense has not been implemented due to issues like political instability and delayed local elections. The local self-governance act (LSGA) gives priority to the indicators of good governance in the paper but in reality, it has not been able to provide expected results due to lack of accountability, transparency and rule of law in the local bodies, suffering from lack of elected bodies. This has directly affected the performance of institutions like municipality and other solid waste management institutions, which are responsible to public for providing basic services.

Through the study, it can be said the developing countries like Nepal have to take a long-term view when implementing any development approach as such measures largely depend on the country's core systems such as public administration, judicial system and national implementation mechanisms.

In the context of study area, state institutions have failed to implement the laws and policies related to solid waste management. It shows that, Nepal as a state lacks public sector institutions with strong institutional capacities. The institutions responsible for solid waste management have not been able to develop and implement policies adaptive to the changing political context. At the same time to boost the institutional qualities within the public sector there is a need of continuous effort to improve the governance system of the country with institutionalization of good practices and norms but this has not been happening in Nepal. Governance at the uppermost level has been poor which has affected state institutions and their performance. The culture of governance that has persisted for decades have not changed and it has affected institutions like municipalities responsible for providing services as basic as solid waste management. In the study area, the non-state actors are also affected by the weak governance and poor institutional capacity of the municipality. They have not been receiving enough support from the municipality and their prospects for growth are restricted due to this. Informal sector as well as other private service providers' contribution to resource recovery from waste through activities like composting,

segregating non-biodegradable waste and selling it to recycling industry has not been acknowledged, though municipality has plans to accommodate all the actors, it has not come into effect yet and still in its initial phase. All of these conditions points out for the need of improved governance at macro level leading to upgrade in public institutions and other actors directly/indirectly affected by them.

On the brighter side, one area where LSMC has tried to improve its performance, is with the initiation for involvement of local communities in form of women's group participation in solid waste management at household level. Adoption of this approach for solid waste management has helped to contribute to the integrated waste management process though at smaller scale. While on the other hand it is also possible that the concept of participation may have worked in the municipality because of the dominance of one ethnic community following the same religion, culture and speaking the same language; and it might not have worked if the demography was mixed in nature.



## 7 Conclusions and recommendations

Managing solid waste effectively has been a major problem in municipalities of Nepal. The problem is more rampant in growing urban cities than rural areas. The analysis of research findings from Lalitpur Sub-Metropolitan City makes it evident that the current solid waste management system in the municipality has not been able to provide waste management services to the public effectively and efficiently. Though progress in waste management sector in the municipality have been observed such as directly involving women an integral part of the community to contribute to solid waste management. Nevertheless, a number of factors like quality of governance in the state and institutional aspects of public institutions influence the performance of waste management system. Upgrading these factors have become vital for the improvement in waste management services.

Thus, this study is focused to investigate the relationship and effect of governance and contribution of public- participation particularly women's group in the management of solid waste in Lalitpur Sub-Metropolitan City.

From the discussion, the major problem with solid waste management system in LSMC is largely related to efficiency in waste collection services, lack of co-ordination between private organizations and municipality, lack of sustainable waste disposal practices and lack of resources. All this can be related to the quality of governance in the state which is the outcome of political instability for more than a decade. It has adversely affected the local governing system; this in turn has impact on every area including the waste management sector.

Thus, from the investigation the study concludes that for municipality to achieve proper waste management system it must deal with the weak governance system and practices at macro level where policies and decisions related to solid waste management are made, along with poor institutional arrangement at local level institutions who are directly responsible for delivering waste management services to the public. The governance system in the state has influence on all government bodies and public institutions. In the study area, the effects of the governance indicators not being in place can be clearly seen connected to contributing to low achievements in sustainable solid waste management practices. Such that the failure to manage solid waste in the municipality is due to multitude of factors.

As a method to achieve, better outcome in solid waste management LSMC has used community mobilization through the involvement of women’s group.

The figure below depicts a number of factors contributing to improper/unsustainable solid waste management in the municipality identified by the study.



Figure 17: Main factors contributing to improper solid waste management in LSMC.

Author,2017

There are a number of factors that are responsible for improper solid waste management in the municipality. These factors are fundamentally related to social, economic, political, human aspects of the society. Factors like political instability, political vacuum, low law enforcement, institutional barriers, are connected to the political condition of the country. Whereas prevalence of poverty is related to the social aspect. Similarly, inefficient waste collection and handling practices, inability to optimally utilize women’s group activities are related to lack of capable human resources as well as absence of sufficient economic resources.

### 7.1 Current System of Solid Waste Management in the municipality

Current solid waste management practices of municipality are unsustainable in nature. Waste segregation is limited to household level and segregation by the informal waste workers at transfer station. While the collection and transportation of waste is basic and inadequate. Collection and transport methods are underdeveloped where collected waste is transported in open vehicles that poses both human and environmental risk. People in poor urban areas like squatter settlements still dump in river banks and open spaces in the absence of adequate collection services. Collection services were found to be infrequent due to reasons like protest by the locals in the landfill site. Recycling and composting of the waste is undertaken by women's group and private actors after receiving trainings from the municipality. However, municipality itself has not officially adopted composting or recycling of solid waste as a method of waste management.

Recycling activities are undertaken by the informal sector, which has not been integrated into the municipal system; while the work of informal waste workers is hazardous and risky in nature. The amount of recyclable material retrieved from the transfer station of the municipality goes to the scrap dealers and recycling industries; whereas the amount of these materials is not recorded by the municipality.

Proper waste disposal is another important aspect of SWM, SWM Act 2011 has provisioned that vehicle to be used for transportation of solid waste should be prescribed keeping into account weight, life span, procedure, capacity of the road and the impact on the environment while transporting the solid waste.

But in reality, it seems LSMC has not been able to use the vehicles as prescribed by the act. Therefore, it poses some risk of damage to the environment and local health during the transportation of the waste. Locals have also protested in this matter but the absence of accountable local body has created ambiguities to distinguish between public severely affected by transportation and public demanding compensation driven by political motives and protesting just to disrupt the process of waste disposal. Both municipalities (KMC and LSMC) are unable to solve this problem by themselves; as they need support from central government body for this. But then

again the municipalities are lacking behind in capacity as institutions to collaborate and attract enough attention of central government to solve the common problem for the greater good of the society.

For the management of landfill site two municipalities KMC and LSMC are responsible. Along with them SWMTSC a central government body is also responsible for initial activities like land acquisition, compensation distribution and physical construction. Since existing landfill has already crossed its time bound and almost exceeded its capacity, the construction of the new landfill site 2km further from the current site has started since 2013(KMC,2015). But the construction is going at a slow pace, in three years only access road has been completed, whereas other infrastructure construction is slow.

The Solid Waste Management Act 2011 makes LSMC responsible for the management of solid waste by construction and operation of infrastructures like transfer station, landfill site, processing plant, compost plant, biogas plant including proper collection of waste, final disposal and processing. But from the study it is revealed that LSMC is involved in collection, transportation and final disposal of waste, along with the operation of transfer station in Balkhu. But it has not constructed processing plant, compost plant or bio-gas plant. This points out to the inability of municipality as an apex body for SWM to abide by the law.

Thus, it has become evident that LSMC lacks strategic and operational plan required for attaining a competent SWM system. For the SWM to be efficient the institutional and managerial arrangement should be clear in their role and responsibilities. In addition to that, there is a need of formulation and implementation of updated policies and strategies on SWM combined with mechanism for monitoring and evaluation.

## 7.2 Governance influences on Solid Waste Management in LSMC

Nepal is going through the political transition; the country has just become a federal republic state from monarchy drafting the new constitution. It has not been able to establish a stable government for more than a decade now and has not been able to hold election to appoint local level government. This has affected governance practices in all the government bodies starting from the

ministries to the local bodies. This lack of certainty at the highest level combined with the absence of locally elected representatives at local bodies has led to the weakening of public institutions, leading to difficulties in their functioning.

In the context of the study area, from the administrative point of view the present structure of solid waste management does not appear to be performing adequately to deliver effective and efficient waste management services.

### 7.3 Current Challenges faced by the municipality

Current political situation, which has created vacuum in the local bodies has severely affected the day to day functioning of the municipality, starting from waste collection to waste disposal at the landfill site. In addition to that inadequacy in financial and economic resources has adversely affected the services provision capacity of the municipality. According to reports by the municipality waste segregation at source is practiced by 70% of the households but the collection of segregated waste is practiced partially which is due to the lack of transportation vehicles and adequate human resources which makes the implementation of 3R principle in the municipality a tough goal. Inadequacy of resources either financial or human is prevalent in the municipality. Whereas waste collection is also affected by the lack of resources to some extent, while some of it is dependent on municipality's inability to optimally use the available resources.

At the same time municipality's incapability to do written agreement with the private service providers has created obscurities related to tariff and authentic data about waste collection and generation in the municipality. The municipality does not have a material recovery facility so, they rely on the informal sector for the waste segregation at the transfer station. This is taking up a large amount of revenue from the municipality that it could have utilized to upgrade its services.

The municipality has not been able to raise awareness among the public at larger scale except for the women's group, this has limited the source segregation activities to household related to women's group only.

There is no monitoring and evaluation system in the municipality for the waste management services provided by the municipality as well as private service providers which creates difficulties

in knowing the actual drawbacks of the current system and what actually needs to be done to improve the services. In the absence of recording system data about waste in the municipality are mostly based on assumptions. This has led to unclear and inconsistent data related to waste, which creates difficulties in improving the current practices also complicates further research.

Thus, municipality is facing a number of challenges related to financial and human resources along with challenges associated to the political context of the country.

#### 7.4 Women's Group Participation in SWM in LSMC

Women's group as community-based organizations has been involved in SWM activities for more than a decade now. Initially women's group from few wards of the municipality were involved in SWM activities but currently most of the wards have women's group. Involvement of women's group in SWM is a community mobilization strategy followed by the community development section of the municipality. Since, women are the one managing the household providing them capacity building trainings related to household management of solid waste has produced prolific results in the municipality though the scale is small as compared to the large population of the municipality. This has made LSMC one of the few municipalities in Nepal with high level of community participation in SWM. Women's group in LSMC are working actively in waste minimization activities but they also have to manage the house and some are engaged in other income generating activities, due to this reason they are sometimes unable to provide full-time for the women's group activities. But the presence of co-operation and co-ordination between the different members have made their work easier.

They have awareness that their work for SWM matters and it is beneficial to them as well as for the community they live. This awareness and attitude of women's group towards waste management has made it easier for the municipality to mobilize them and generate positive outcomes.

Accomplishments by the women's group make it evident that it is possible to achieve behavior and attitude change in people. It became possible, with the facilitation from LSMC, to achieve change in practices among the citizens especially women. However, they require assistance from the municipality to continue their good practices. Municipality needs to supplement the work of women's group by providing them tools and resources for recycle, reuse and reduce practices. In

addition, provision of regular collection vehicles for organic and in-organic waste needs to be done by the municipality to continue with the segregation practices at household level.

Thus, success of women's group activities is inspirational in a situation where public institutions responsible for SWM are struggling to deliver proper services to the public. Since, women's group activities are closely tied to community development section of the municipality, in the long run their activities are bound to be affected by the governance practices at higher level.

## 7.5 Recommendations for better SWM in LSMC

### 7.5.1 Formulation and Implementation of policies, strategies and guidelines

For the improvement of SWM practices in Nepal, Solid Waste Management Act 2011 was enacted. However, it has not been effectively put into action so that results could be generated. The country needs to develop a national SWM policy and strategy that specifies the objectives, guiding principles, and an implementation strategy with a timeline and a clear monitoring and evaluation mechanism. This would help the local bodies responsible for SWM to work in a specific direction. In addition, implementation of available technical guidelines is also a necessity for SWM to deal with the issues related composting, resource recovery technologies, and landfill development and operation.

### 7.5.2 Promotion of Reduce, Reuse, and Recycle (3R Principle)

Organic waste is a large constituent of solid waste in LSMC. Solid waste from household has 77% of organic waste. There is a substantial proportion of reusable and recyclable materials from the waste generated. It provides an opportunity to promote 3R principle, so that it is possible to reduce the amount of waste disposed at landfill site (ADB,2013). This will help in saving cost associated with waste collection, transport and disposal. Eventually, reducing the risks on public health and environment.

Waste segregation at source as practiced by women's group should be promoted at wider scale through involvement of more household in the process of awareness raising and capacity building activities. On the other hand, increment in the knowledge and technical skills among municipality staff is also required. Promotion of organic composting and marketing of already existent organic compost prepared by women's group and private actors can help to reduce the waste. There are

already few community composting plants developed by the women's group, municipality can promote development of composting plant in various other areas depending upon the capacity and level of interest of women's group.

#### 7.5.3 Institutional development of LSMC

The Local Self-Governance Act and SWM Act has authorized municipalities to take charge of collection, transport, treatment, and final disposal of MSW. However, LSMC deals with the inadequacy of financial and human resources at the same time they are not being able to use the available resources optimally due to lack of technical and managerial skills. It is essential to develop the capacity of local bodies especially of the units responsible for solid waste management. In addition, establishing better co-operation and co-ordination among the various state institutions working for SWM is necessary. municipality cannot act alone it needs financial support from the Ministry, technical support from SWMTSC and co-operation with KMC for landfill site management.

#### 7.5.4 Lessons from Past Failure

The Gokarna landfill site, which LSMC used to dispose waste till 2005 was collapsed due to excessive political interference; combined with the protest by locals due to the health and environmental hazard created by the site (Nychhyon,2006), A new landfill site is under construction in Banchara Dada, for the municipality to dispose waste(KMC,2015). For the municipality to be able to use the landfill site in a proper manner it needs to keep in mind the issues that rose in earlier landfill sites.

Similarly, SWMTSC along with the municipalities need to make construction of new landfill site a priority. For this to happen they need to prepare a timetable for the construction of work allocating adequate resources and establishing system to monitor the construction work. Also, carrying out the construction work as mandated in SWM Technical guideline can help to solve the problem associated with proper waste disposal.

#### 7.5.5 Adoption of Public Private Partnership (PPP)



According to Solid Waste Management Act 2011, local body can involve private and community sectors in management of solid waste. For this private actor need to obtain license from the local body. In addition, the local body can award SWM function to private or community sector party only through competition. This has not been happening currently in the municipality but local body (LSMC) can formally involve the already working/active private actors and community sector through partnership mechanism. It has become evident that SWM management lies beyond the capacity of municipality alone. This situation demands for new and innovative approach to mobilize the various stakeholders as partners for effective and efficient SWM services.

In this context, Public Private Partnership (PPP) could best address the problem by involving the private sector, community and the municipality. LSMC can establish a PPP unit that focuses solely on SWM activities of municipality, private actors and other informal actors, so that the municipality can reduce the municipal expenditure for SWM. Eventually they can generate revenue from solid waste in addition to the improvement in services and coverage. Whereas, to attract private sector for PPP, LSMC may need to provide subsidy in the initial stage of partnership. In addition, a guideline for the involvement of private actors keeping in mind the existing laws can be helpful.

#### 7.5.6 Public Involvement through awareness raising

LSMC, alone cannot keep the city clean; it needs the support from the public. One of the issues that municipalities in developing countries have to deal with is low level of awareness and education among its citizens. Public involvement can be ensured through information, education, and communication campaigns; specially enhancing public awareness of 3R principle leading to better SWM. Awareness should be raised about controlling the haphazard waste disposal in open spaces starting with school going children. In addition, to garner support from the locals of new landfill site, communities need to be consulted and their acceptable needs and demands should be addressed following the existent legal guidelines.

#### 7.5.7 Adoption of Integrated Solid Waste Management

There is an existence of not so efficient practices of SWM in LSMC, where public dispose waste on open spaces, river banks and road sides which adversely affects the environment, posing public health risks. This is mainly due to low level of public awareness and collection efficiency of the municipality. Integrated approach to waste management can be a more preferred approach to deal with the increasing volume of solid waste in LSMC. To achieve integrated SWM system consideration of every aspect; the environmental impact, socio-cultural issues, existing organizational structure, policy decisions, legal structure, economic dimension, capacity building and awareness raising activities are all crucial. Integrated SWM is based on source segregation, scientific collection, transportation, processing and limited disposal of solid waste. Whereas, the implementation and effectiveness of integrated SWM largely depend on the level of public awareness and participation; since it requires public to segregate waste at source, reuse and recycle at household as well as at municipal level.

#### 7.6 Implications for further research

The present study has examined the solid waste situation in Lalitpur Sub Metropolitan, with the focus on effects of governance on waste management and efforts in the municipality for better waste management through the participation of women's group in waste management activities. During the course of study, a number of issues have been identified that affect solid waste management in the municipality. These themes include contribution of private service providers, involvement and contribution of informal sector in waste reduction, relationship between all the actors involved in waste management system, development of appropriate methods and strategy to generate and manage data on waste and appropriate strategies and technologies for integrated waste management system. These aspects affect the solid waste management system but has been under-researched. Thus, further research in these areas are recommended to generate a better understanding of solid waste management in LSMC and lay a foundation for sustainable solid waste management system in the municipality.





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## APPENDENCES

### APPENDIX I

Solid Waste: Solid Waste is broadly comprised of non-hazardous domestic, commercial and industrial refuse including household organic waste, hospital and institutional garbage, street sweepings, and construction wastes (Zerbock, 2003). A report prepared by (World Bank, 1999) lists eight major classifications of solid waste generators:

1. *Residential*: Includes waste generated in household units, such as food and fruit peels, rubbish, ashes etc.
2. *Industrial*: Has two components *hazardous*, which is toxic; corrosive; flammable; a strong sensitizer or irritant and may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or disposed of or otherwise managed. *Non-hazardous* which includes inert and essentially insoluble industrial solid waste, usually including, but not limited to, materials such as rock, brick, glass, dirt, and certain plastics and rubber, etc., that are not readily decomposable.
3. *Commercial*: Waste produced by wholesale, retail or service establishments, such as restaurants, stores, markets, theaters, hotels and warehouses.
4. *Institutional*: Waste that originates in schools, hospitals, research institutions and public buildings.
5. *Construction and demolition*: Waste building material and rubble resulting from construction, remodeling, repair, and demolition operations on houses, commercial buildings, pavements and other structures
6. *Municipal services*: Sludge from a sewage treatment plant which has been digested and dewatered and does not require liquid handling equipment etc.
7. *Process*: Treatment plant wastes principally composed of residual sludge and
8. *Agricultural*: Spoiled food wastes, agricultural wastes, rubbish, hazardous wastes.



## APPENDIX II

The interviews are conducted purely intended for academic purpose. In order to write the Master's thesis in Municipal Solid Waste Management at NTNU, Norway.

Interview Guide for government/municipality officials

Name:

Gender:

Workplace:

Designation:

- What is the total waste generated in the municipality
- What are the types of waste generated in the municipality?
- Who are the participants in waste management system in the municipality?
- Can you say a little about Lalitpur SubMetropolitan City 's (LSMC) Solid Waste Management practices and procedures?
- What do you think is the problem with the current municipal solid waste management system?
- What in your view are causing those problems?
- As an institution what LSMC is doing to solve the prevalent problems?
- Have you set any objectives for SWM in LSMC?
- What are your municipalities plans to achieve these objectives?
- What are our views about the public awareness situation in the municipality?
- What are your views about women's group participation in SWM at household level?
- Is the involvement of women's group for SWM at household worked for LSMC?
- What can you say about the enforcement of existing laws, environment policies and regulations in LSMC?
- How is the co-operation and collaboration between other government institutions, NGOs and other stakeholders working for SWM in LSMC?
- What are the future plans of LSMC for co-operation and collaboration?
- Are you satisfied with the services municipality is providing to the public, what do you think should be improved?
- Issue of disruption in the landfill site is always in the news, what is the municipality doing to deal with it?

## Interview guide for NGOs

Name:

Gender:

Designation:

- Introduction about the organization:
- What are the solid waste management activities carried out by your organization?
- What are the problems faced by your organization and private service providers in general face in LSMC when working for SWM?
- What are your measures to deal with these problems?
- How is your relationship with the municipality?
- How do you collaborate with the municipality for SWM activities?
- Do you also work with women's group?
- What activities do you do with women's group?
- What are the future plans of your organization in relation to SWM in LSMC?
- What is the coverage area of your organization in LSMC?
- Problems with landfill site is always in the news, how is your organization dealing with it?



## Interview guide for Women's Group

Name of the women's group

Name:

Designation:

- Since when the CBO has been collaborating with the municipality?
- What programs do you do in collaboration with the municipality?
- Have these programs been able to give positive results?
- Has there been any change in the behavior of the people regarding waste management?
- What effects do you think have the changing political context in waste management system?
- When did municipality start public participation in waste management?
- What type of trainings and assistance have you been receiving from the municipality?
- How satisfied are you about being in women's group and your contribution for SWM in municipality?
- Are you satisfied with the service the municipality is providing? What is your opinion about waste management and how should it be improved to meet your expectations?
- Do you think there is enough knowledge provided by the municipality on waste management to the community in general?
- What are the future plans of your organization for SWM?



Photographs from Field Work



Compost Bin Distribution to Women's Group



Segregation Bin Distribution to Women's Group



Waste Segregation by Informal Waste Workers



Waste segregation by informal waste workers at Transfer station of NGO



Waste collection vehicles used for inner core areas



Compost bins used by NGO



Community Compost Plant established by Women's Group



Roof-top gardening practiced by women's group at household level