Urbanization and Solid Waste Generation in Urban Longleng District of Nagaland: Present Practices and Future Challenges

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Abstract

Urbanisation is a growing issue in Longleng. So are the consequent solid waste generation and its management challenges. Population growth has a positive impact on urbanization process. This article is intended to explain the common problems facing public services today and the challenges faced by both the urban planners and the government. The paper reviews an overview of solid waste management generation in urban Longleng. Solid waste management which is already an immense task in urban Longleng is going to be more difficult with the expansion of urbanization, increase in consumerism and changing life style. The result shows that residential (59.5%), commercial (20%), institutional (16%), biomedical wastes (0.30%), construction and demolition (4.2%) contribute to solid waste generation. The current practices of dumping waste materials in urban areas have shaped serious environmental and public problems. Financial resources constraints, institutional policies weaknesses, and public indifference towards solid waste have made this situation worse. This research article evaluates the current practices prevalent to deal with this solid waste and problems associated with it. It also provides the measures to deal with this waste in a healthy and environmental manner so that it may prove a resource instead of waste. The results of this study will be of immense benefit for urban-related studies in small towns as well as for the urban planners in the district.

Keywords: Population, urbanization, solid waste generation, Nagaland

1. Introduction

The process of urbanisation is now becoming a global experience. The high population growth rate, declining opportunities of employment in the rural sector, and the transition from the slow and low-paid primary sector to the higher-paid urban occupations have mainly contributed to the urbanization process (Joardan, 2000; Shekdar, 1999; Sharma and Shah, 2005; Dolar et al., 2016). Urbanisation directly leads to the generation of solid waste material, and unscientific waste management cause health risks and degradation of the urban environment. Municipal solid waste includes households waste, non-hazardous solid waste discarded by the manufacturing sector, commercial and institutional establishment, market waste, and street sweepings which are collected and manage by the municipal authorities for disposal (Ahsan, 1999; Kansal, 2002; Pappu et al., 2007). Due to the rapid growth of production, consumption, and circulation of industrial units, urban society regularly discards and produces solid materials, resulting in a substantial increase in the quantity of solid waste generated from various sources such as domestic waste, industrial waste, and commercial waste, biomedical waste in hospitals and nursing homes (Rathi, 2006; Jha et al., 2003; Singh and Singh, 1998; Khan, 1994). Modern urban life has brought garbage problems because everything in packaging and fast food products generates garbage, and the amount, and composition of garbage changes with each passing day (Srivastava et al., 2005; Brown 2015). Urban waste today refers to solid waste generated by the public and society in their daily operations. To examine the analysis of waste management, it is important to describe what it is: waste surveys are the detection of waste streams, their origin, composition, and destination. This is usually done through waste audits or measurement procedures (Franchetti, 2009; Kansal et al., 1998) year). Waste minimization is classified as the process of sinking waste streams by reducing sources, reusing, and recycling materials, thus achieving a healthy environment. Municipal solid waste includes mixed household waste/household waste, recyclable, such as newspapers, plastics, aluminum cans,
packing cartons, soda bottles, steel cans, household hazardous waste, commercial waste, garbage, and community trash can waste, white goods (refrigerators, washing machines, freezers, water coolers, stove boilers, etc.), including construction and demolition waste (Jain, 2007; Rajput et al., 2009). There are a variety of solid waste treatment technologies around the world, including methods such as dumping into open spaces and landfills. Despite the huge environmental problems, it is considered to be the main method of disposal of municipal solid waste in many towns/cities (Berkun et al., 2005; Imam et al., 2008).

2. Urbanization and the generation of municipal solid waste: a brief overview

Rapid urbanization is taking place, especially in developing countries. Globally, 41% of the world's inhabitants lived in the urban sector in 1985, and it is expected that by 2015 this proportion will increase to more than 60%. Between 1990 and 1995, the average growth rate of the Asian urban population was 3.2%, while that in rural areas was only 0.8% (World Bank, 2018). Currently, around 2.10 billion metric tons of urban solid wastes are generated in the world each year. The World Bank estimates that by 2050, the total amount of waste generated will increase to 3.4 billion metric tons. It is estimated that 13.5% of current waste is recycled and 5.5% becomes compost. The report estimates that between a third and 40% of the world's waste is not properly managed, but is thrown away or openly burned. According to the previous report from 2012, the latest version of the information comes from 217 countries and 367 cities. Rich countries (such as the United States, Great Britain, Canada, and EU member states) account for only 16% of the world’s population, yet they generate 34% of the world’s garbage. It is estimated that 93% of waste in under-developed countries is poorly managed, compared to 2% in developed countries. The average daily waste generation per capita in North America is estimated to be 4.87 pounds, while in sub-Saharan Africa it is 1.01 pounds. Compared with rural areas, garbage collection in the urban sector of these low-income countries is more common, but still far lower than in developed countries. The World Bank found that since 2012, collections in under-developed countries have increased from about 22% to 39%, although the reported data may not be directly comparable. India generates 62 million tons of waste every year (mixed waste includes recyclable and non-recyclable waste, with an average annual growth rate of 4%.

In India, according to the 2011 census, of the 1.2 billion people, only 37.7% were urban populations, or 32% of the total population (Bundela et al., 2010; Gupta et al., 2015; Sharholy et al., 2008; Sudhir and Gururaj 2012). In India, around 12 million tonnes of inert waste is generated annually from street sweeping, construction and demolition waste, and landfills, accounting for about one-third of total municipal solid waste (Daskalopoulos et al., 1997; UN-Habitat, 2010). In India, the current municipal solid waste generation rate is 109,598 tons (or 0.34 kg/person/day) per day and is expected to reach 376,639 tons (or 0.7 kg/person/day) per day by 2025 (Hoornweg and BhattaTada, 2012).

From 1901 to 1951, the urban population of Nagaland was less than 2% of the total population. After the 1940s, small towns appeared in Kohima, Dimapur, and Mokokchung. The urban population increased steadily from 2% in 1951 to 5% in 1961. It was not until after 1971 that Nagaland witnessed a moderate increase in the urban population. By 1981, 16% of the population lived in urban areas, which remained almost stagnant for the next 20 years (Jamir, 2021b). Nagaland's urban population in 2011 was 28.86%, slightly lower than the national average of 31.16%. Longleng had no urban population in 2001. But after the establishment of district in 2003, modern town expanded rapidly, and the 2011 census report showed that only 15.08% of the population lived in urban areas (Census, 2011). In Nagaland urban sector comprising of 19 urban local bodies, only the state capital Kohima has the scientific solid waste treatment plant with 50 tonnes per day (ToI, 2019; Jamir, 2020; Jamir, 2021a).

At present, the amount of waste generated from the Kohima is around 54 MT per day. Out of this, around 35-40% of wastes are collected from the entire city as per the present data.

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available. The rest of the urban local bodies have all landfill sites but they dump without any proper treatment (Chatterjee, 2010).

Solid waste management is now an increasingly serious problem in Longling town. Waste lying on roadsides, open spaces, outside drains, etc. causes serious health and environmental hazards to the people. There is no system of the proper waste management system and waste is increasing day by day with the increase in population and increase in per capita waste generation rate due to changing lifestyles, increase in income, and consumerism.

In Longleng town, there is no law regarding waste disposal and treatment of solid waste. The result is that their waste is scattered on any open space or plot or along the road. The authorities pay little attention to solid waste, so the budget allocated to them is very small. No matter how much funds are allocated, they are only used for garbage collection and transportation, and may not be used for other purposes. According to the report, 90% of the total funds are used for collection and the rest is used for transportation, so there are no remaining funds for waste treatment.

3. Theoretical Frameworks

Solid waste generation is a growing challenge to many rapidly urbanizing areas in the world (Minghua et al., 2009; Singh and Sharma, 2002). The generation of waste varies significantly between countries based on the population, poverty, urbanization, culture, lifestyle, public awareness and management (Hazra and Goel, 2009; Wagner and Arnold, 2008; Magrinho et al., 2006; Idris et al., 2004). Generally, developed countries generate more solid waste than developing countries (Kathiravale and Mohd Yunus, 2008). Countries in the East Asian and African regions produce waste in the range of 0.21-0.37 tons/capita/year, while European countries generate a higher quantity of waste with 0.38-0.64 tons/capita/year (IPCC, 2006). In Asia, nations with higher per capita GDP, particularly China, Singapore, Hong Kong, and Japan had been pronounced to generate more waste in contrast to developing countries such as India, Pakistan, Bangladesh, Vietnam, Thailand, and Nepal (Shekdar, 2009). Developed countries are experiencing large amounts of waste generation while developing countries often have problems with the implementation of management systems (Bai and Sutanto, 2002; Periathamby et al., 2009; Manaf et al., 2009). Looking at the waste generation trend in developed countries, it is believed that different countries in transition and growth will have the same experience. In recent years, the amount of waste generated has continued to increase, and it is believed to continue rising. This is an issue that worries the authorities around the world. Improper waste disposal may additionally cause pollution. The main purpose in implementing best practices for solid waste management is to prevent pollution (Liu and Morton, 1998). Solid waste management practices greatly differ across regions, countries, and even within a country (Hoornweg and Bhada-Tata, 2012). The Modern waste management models reduced waste generation, reuse, recycling, reduction, composting, and safe disposal through landfills; however, these are regularly no longer practiced. In developing countries, a large amount of waste is no longer re-used (Machado et al., 2010). As a result, a large share of solid waste in developing countries is disposed of on open dumpsites and many times burnt (Giusti, 2009; UNEP, 2013). In third-world countries, solid waste management is the responsibility of both the municipal authorities and private providers (Oguntoyinbo, 2012; NEMA, 2015). The Collection is often from source or temporary dumping ground, and final disposal is frequently at an open dumping site on the outskirts of the town (Osibanjo and Nnorom, 2007; Needhidasan et. al., 2014). Changes in waste management practices often reflect the existence and level of implementation, available funds, composition and quantity of legal guidelines, and policies governing waste management.

In developing countries, municipal waste is managed by contract workers, with limited protective equipment, and limited awareness of the risks involved in solid waste management (ElWahab et al., 2014). This is particularly important in developing countries, where solid waste

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is often mixed with high-risk waste such as medical waste and industrial toxic waste, especially waste from small facilities that are disposed of as general municipal waste (Bassey, 2006). Normally, they also have no legal protection or recourse in the event of injury, because the terms of their commitment are largely non-binding. The lack of waste sorting and the lack of protective clothing put waste handlers at a very high risk of exposure (Rachiotis et al., 2012).

4. Materials and Methods

4.1. Study Areas

Longleng, the smallest district of Nagaland, located in the northeastern part of India bordering Myanmar, Longleng is the home of the Phom Naga tribe. Longleng lies between 94°E-95°E longitude and 26°N-27°N latitude of the equator, the district is mountainous with an area of 1066.80 sq. km.

4.2. Research Methodology

The methods used in municipal solid waste management, including the collection of information related to solid waste management, are completed by preliminary investigations. To maintain proper urban solid waste management, the field survey was conducted using predesigned questionnaires that included randomly selected households. The objective of the questionnaire is to evaluate the source, quantity, and composition of the waste that each person generates every day. Solid waste collected from 5 different sampling points is uniformly distributed throughout the study area. These points are selected according to the type of area, such as commercial, institutional, market, and residential (see Table 1).

<table>
<thead>
<tr>
<th>Source</th>
<th>Types of solid waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metal, consumer electronics, white goods, batteries, oil, and household hazardous wastes, etc.</td>
</tr>
<tr>
<td>Commercial</td>
<td>Spoiled food wastes, paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes, etc.</td>
</tr>
<tr>
<td>Institutional</td>
<td>Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes, biomedical waste.</td>
</tr>
<tr>
<td>Construction and demolition</td>
<td>Wood, steel, concrete, dirt, plastic, etc.</td>
</tr>
</tbody>
</table>

Source: Hoornweg, Daniel and Laura Thomas, 1999

4.3. Collection of data

The process of a collection can be done in the following.

Format 1-Streetwise data
Identification of the public road/street/small footpath by name or number
Identification of public road/streets junction
Identification of the generators and quantity of waste on both sides of the streets
Identification of residential housed/building.

Format 2-Ward wise data

It is also available through lists on each side of the roads.
Data can be obtained from shops, hotels, markets hospital etc.
In residential areas, the wastes are stored in a segregated manner and then throw in a specific location.
5. Result and discussions
5.1. Level of Urbanization
Urbanization is an indicator of transformation from traditional economics to modern urban economics. It is a progressive concentration of population in the urban units (Davis, 1965). The natural growth of population, reclassification of habitation, and migration are important factors in increasing the urban areas. Table 2 depicts the total population living in urban areas in 2001 was 6972 and in 2011 it was 7613 and the percentage increase in population was only 8.41 per cent.

**Table 2. Urbanization trends in urban Longleng**

<table>
<thead>
<tr>
<th>Year</th>
<th>No. Household</th>
<th>Total Population</th>
<th>% Increases in Urban Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1159</td>
<td>6972</td>
<td>0.00</td>
</tr>
<tr>
<td>2011</td>
<td>1690</td>
<td>7613</td>
<td>8.41</td>
</tr>
</tbody>
</table>

*Source: Census Report, 2001, 2011*

5.2. Solid waste generation in quantity
Solid waste management in urban Longleng highlights certain significant issues which are associated with the generation, storage space, collection, transport, and disposal of wastes in an environmentally friendly and sustainable approach (Jalan and Srivastava, 1995). A Study on the physical investigation of solid waste generation in urban Longleng was conducted on samples collected from five locations. The daily generation of wastes is generated mainly from the major sources, such as residential (59.5%), commercial (20%), and institutional (16%), biomedical wastes (0.30%), and construction and demolition (4.2%). In the composition of solid waste, large amounts of biodegradable wastes are present. Almost 60% is composed of biodegradable wastes. Longleng town produces approximately 5 tonnes of solid waste per day and Longleng town council is miserably inadequate in managing the disposal of solid waste generated. It is estimated that the per capita generation of solid waste works out to 0.8 kg/day with a population of 7613 as per the 2011 census report (see tables 2 and 3). The results found sharp increases in solid wastes collected in recent years can be attributed not only to the rapid economic development and population growth but also to the changing modes of living standard. It was also found that the composition of solid waste varies from place to place, based on factors such as population, source, average income, social behavior (Gupta et.al., 1998).

**Table 3. The present scenario of solid waste generation in Longleng town**

<table>
<thead>
<tr>
<th>Waste generation source</th>
<th>Proportion of wastes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential areas</td>
<td>59.50</td>
</tr>
<tr>
<td>Commercial (Markets, shops, etc)</td>
<td>20.00</td>
</tr>
<tr>
<td>Institutions (offices, banks, college, school etc)</td>
<td>16.00</td>
</tr>
<tr>
<td>Biomedical waste in hospital</td>
<td>0.30</td>
</tr>
<tr>
<td>Construction and demolition</td>
<td>4.20</td>
</tr>
</tbody>
</table>

*Sources: Field Survey Report, 2018-19*

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5.3. Street cleaning

Town councils were created under Nagaland Municipal Act, 2001, road/street sweeping is the obligatory responsibility of the town council and the solid waste generated in the town shall be collected, and removed by the sanitary workers. The local body in Longleng has deployed 9 (nine) sanitary workers i.e., 5 persons engaged in street sweeping as per 2018-19. The major constituents of the road sweepings are silt, dust, dry leaves, paper, plastics, etc. All the roads and streets are not being swept daily. In practice certain roads and markets are swept daily, some are swept on alternative days or thrice a week. The street sweeping work is expected to be carried out from 6:00 to 8:00 A.M in the morning hours, where sweepers are engaged in sweeping the main town areas which cover almost 1(one) km of road and account for 5 per of the total population. Apart from solid waste collection, certain improvements in the system are also undertaken from time to time to make the management more effective where the district administration organized a ‘Mass Cleaning Program’ on Swachh Bharat (see table 4).
Table 4. Physical result of the street sweepers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of times sweeping of streets in a week</td>
<td>3 times</td>
</tr>
<tr>
<td>Length of road in the town need to be clean</td>
<td>1 Km</td>
</tr>
<tr>
<td>Frequency of streets sweeping and percentage population covered</td>
<td>5%</td>
</tr>
<tr>
<td>No. of workers employed in streets sweeping</td>
<td>5 (3 female and 2 male)</td>
</tr>
<tr>
<td>Wage per worker</td>
<td>2500</td>
</tr>
</tbody>
</table>

Sources: Longleng Town Council Report, 2018-2019

5.4. Collection and transport of solid waste

The removal of garbage is a very significant determinant of solid waste management. In the case of transportation of solid waste, the wastes are collected from streets at five points in the town. At present, the amount of waste generated from the Longleng town is approximately 5 tonnes per day. Out of this, around 20-25% of wastes were collected from the entire main town area as per the field survey report 2019, and also found that 20% of the household dispose of their waste in the streets (refer to table 5).

Table 5. Physical result of the solid waste

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of solid waste disposed at a dumpsite in a day</td>
<td>5 tonnes</td>
</tr>
<tr>
<td>% of the collection of waste from the town</td>
<td>20-25</td>
</tr>
<tr>
<td>% of households practice storage of waste at source in domestic bin</td>
<td>2</td>
</tr>
<tr>
<td>% of household disposed or throw solid waste on the streets</td>
<td>20</td>
</tr>
<tr>
<td>% of non-residential premises dispose of throw solid waste on the streets</td>
<td>2</td>
</tr>
</tbody>
</table>

Sources: Longleng Town Council Report, 2018-2019

In Longleng town solid wastes were collected from different community dustbins are transported to disposal sites by trucks. Transportation of waste was done through manual loading and then disposes to the dumping site which is (approx. 1 km) away from the main town towards Hukpang village. At present, for the disposal of wastes, open dumping is practiced. The cost of transportation constitutes a very large part of the management costs incurred in solid waste disposal. The timings for waste transportation work are from 6.00 a.m. However, these timings depend on the workload in that particular area where the transportation is to be done. The trucks used for this purpose, generally are of open body type and carry 2-3 tones. They are usually kept uncovered and during journeys, the waste tends to spill over on the road. The waste collected from the road and the bins are directly transported to the final disposal site. The transportation of waste from the community waste storage sites may be planned by following the frequency of containers or heaps becoming full, the containers to be cleared on alternate days or twice a week (Colon and Fawcett, 2006; Malviya et.al. 2002; Nema, 2004). The total area of the disposal site is approx. 3 acres located at the southwest of the town.

Table 6. Result of solid waste collection from depot

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of the point from where sanitary workers collect solid waste</td>
<td>5</td>
</tr>
<tr>
<td>Method of primary collection adopted</td>
<td>Manual</td>
</tr>
<tr>
<td>Vehicle use for transportation (5-ton capacity)</td>
<td>Truck</td>
</tr>
<tr>
<td>Number of Sanitary workers employed</td>
<td>4</td>
</tr>
<tr>
<td>Frequency of collection of waste from the depots</td>
<td>3 (times) in a week</td>
</tr>
<tr>
<td>Number of bins cleared</td>
<td>8</td>
</tr>
<tr>
<td>Distant of the disposal site</td>
<td>1 (one) km</td>
</tr>
</tbody>
</table>

Sources: Longleng Town Council Report, 2019-2020
Table 7. Results of physical analysis of solid waste generation

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Leinak</th>
<th>Agri</th>
<th>Shayung</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradable organic waste</td>
<td>64.8</td>
<td>66.1</td>
<td>71.3</td>
</tr>
<tr>
<td>Paper and cardboard</td>
<td>6.5</td>
<td>8.0</td>
<td>7.3</td>
</tr>
<tr>
<td>Plastics</td>
<td>8.8</td>
<td>10.2</td>
<td>6.2</td>
</tr>
<tr>
<td>Metals</td>
<td>1.9</td>
<td>2.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Glass and Ceramics</td>
<td>2.1</td>
<td>3.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Bio-Resistant (cloths, leather, napkin)</td>
<td>3.7</td>
<td>5.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Inert materials (stone, brick, etc.)</td>
<td>4.8</td>
<td>2.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Fine earth (ash, dust, soil)</td>
<td>3.3</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Others (wooden substance, rubber, animals bone, etc)</td>
<td>4.1</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Sources: Field Survey Report, 2019-2020

6. Challenges and strategies to deal with solid waste

*Awareness to enhance segregation:* Awareness and community participation to segregate waste at the source, door-to-door collection, and disposal in proper collecting bin is fundamental. However, the current situation in Longleng demonstrates that almost no rubbish is separated at the source, resulting in a variety of environmental issues and making waste separation at the dumping site extremely difficult. Households also discard garbage improperly due to a lack of coordination among residents and a lack of a town planning framework. Apart from that, community bins are not readily available, and the number of staff employed by Urban Local Bodies (ULBs) is insufficient for the population in the area.

*Proper Planning:* When a new residential ward or market area is established, the authority must ensure that proper waste disposal and treatment is in place, so that waste is treated at the source and does not spread throughout the area, reducing the amount of money spent by the council on waste collection and transportation. This will relieve the council's workload, and the resources saved can be put to better use elsewhere. In this regard, the legislation must be properly enforced and enforced in order to prevent a large-scale escalation of the problem.

*Characteristics and quantity of waste:* The survey results show the characteristics of waste in a given location as well as the amount of each category of garbage, such as biodegradable, hazardous, construction, and so on. And, because the population is expected to grow each year, the future amount of waste in any given location can be predicted, allowing various waste disposal strategies to be developed.

*Collection and transportation of waste:* Regular door-to-door collection should be promoted so that waste does not accumulate or is thrown here, endangering the residents. To minimise depositing rubbish at any location or along the roadside, suitable containers or waste disposal pits should be placed within easy reach of residents in every region. Vehicles specifically intended for this purpose should be assigned to transport waste to disposal facilities, ensuring that no waste is shared between them before they arrive.

*Disposal and recycling of waste:* Waste should only be disposed of at properly designated places where there is no risk of leaching into the earth. Composting is the best method for utilising this waste and converting it into a resource that can be used in the kitchen garden because Longleng is an agricultural district and people enjoy fresh food and vegetables. As a result, kitchen waste or biodegradable waste is more prevalent here, and composting is the best method for utilising this waste and converting it into a resource that can be used in the kitchen garden. Small pits should be dug individually for each type of garbage collection in the residential ward, and biodegradable waste should be processed at the source level by turning it to manure.

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Urbanization and lack of appropriate level funding: With significant population increase, providing enough infrastructures in the urban area, as well as selecting new waste sites, is a major concern.

Community/NGO’s participation: People are ultimately the creators of garbage, thus no waste management programme can succeed without their assistance. Effective people in society, such as ward chairman, NGOs, and others, should be enlisted to help sensitise and educate the public about solid waste management.

7. Conclusion

From the above results it can be concluded that, with the increase in population, rapid urbanization and rural-urban migration one can observe that there is an exponential increase in waste generation in the district. The result found that Longleng town produces approximately 5 tonnes of solid waste per day and the per capita generation of solid waste comes out to 0.8 kg/day with a population of 7613 as per the 2011 census. Another approach is to develop awareness programs for the population of the city about the generation of waste and its impact on human health and sustainability. The study found that due to weak implementation, existing policies, and interventions, surveillance is almost non-existent. Proper laws should be passed by the town council in this regard for proper disposal of waste. No new plan of any residential, commercial, institutional, construction and demolition site should be passed until and unless it has a proper place for disposal. Solid waste management is the need of the hour which should be taken seriously by government/civic bodies to provide proper solid waste management service to the public. Therefore, the necessary measures should be taken as soon as possible to reduce the waste from disposing or recycling.

Abbreviations
WB: World Bank
USA: United State of America
EU: European Union
IPCC: Intergovernmental Panel on Climate Change
GDP: Gross Domestic Product
UNEP: United Nation Environment Program
NEMA: National Environment Management Authority.
ULBs: Urban Local Bodies

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REFERENCES


https://ijbtob.org


https://ijbtob.org


https://ijbtob.org


https://ijbtob.org

WWW. Times of India June 4 2019.

WWW. National Informatics Centre, Logleng district unit, Nagaland.