

# AWARENESS LEVEL OF URBAN DWELLERS ON SOLID WASTE DUMPING IN LOIKAW, KAYAN STATE (MYANMAR)

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## **Abstract**

*Nowadays, the wastes which are produced from different sources are threatening all environments. Even most of the wastes are caused by the various activities of human beings, those wastes again have become such a great problem in the communities and for the kinds of health condition. As a result, the awareness level of the people throughout the world is main challenge to meet the goal of SDGs. Loikaw, capital of Kayah State, Myanmar, was selected due to the area is located as fringe area of the country, due to the area was formerly assumed as one of the less developed state in the country, and due to the area is inhabited mostly by Kayah, Kayan and Kayawethnics. Therefore, the interest has been come out to evaluate the awareness level on the solid wastes and such many research question regarding solid wastes as sources, types, methods of collection and dumping, etc. could be set in this paper. Questions were raised by using interviewing method and were conducted by the team from Geography Department, University of Mandalay. The semi-structured questions were prepared and 25 households by each ward were selected as sample sites. There 13 wards and out of them, 5 have been newly converted from the villages as urban area by the Town Development Committee about 2000s. After collecting the primary data, the processes were worked out and mapping was done with the aid of GIS technique. The analysis was done with SWOT criteria. The overall result was that the awareness level of the local people was comparatively high to that of another town in Myanmar.*

**Key words:** Solid waste, Bio-chemical, Bio-medical.

## **Introduction**

'Solid wastes' means the waste materials which are neither liquid nor gas, and which is insoluble Bio-chemical, Chemical, Bio-medical, wastes which come from animals are called solid wastes. There are four kinds of solid wastes which are; Wastes from Houses. Wastes from Factories. Wastes from Medical Pharmacies and Hospitals. Wastes which can be re-cycled wastes and which can be useful again.

## **Definition on different types of waste**

### **Wastes from Houses**

The waste materials from houses include waste materials from the kitchens, fallen-decayed leaves, and remains of vegetables.

### **Waste Materials from Factories**

The waste materials from factories include all the waste materials which are harmful for health such as house paint, chemical products and materials, electrical appliances, empty glass bottles, chemical fertilizers, empty tins and bottles of pesticides, decayed batteries, empty paint tins.

### **Waste materials from pharmacies and Hospitals**

Waste materials from used injection needles and medicine wastes, medical wastes, expired medicines, blood- stained clothes, waste materials from hospitals are included.

### **Waste materials which can be Re-cycled and Re-used**

Papers which can be re-cycled, glass, bottles, metal goods, plastic waste materials can be re-used.

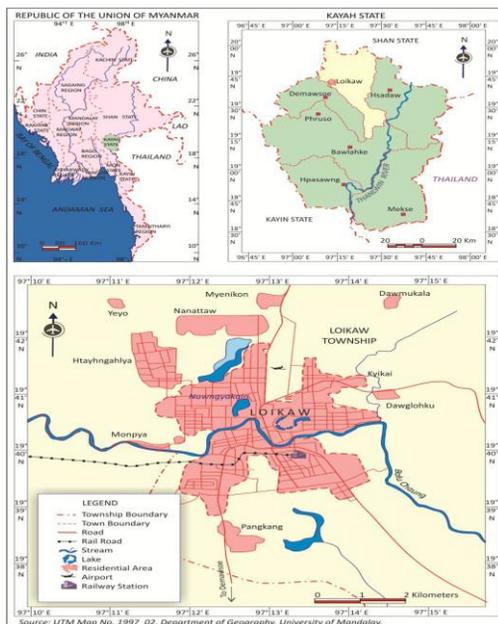


Figure 1. Location of Study Area

## Aim and Objectives

The main aim of the research paper is to evaluate the level of awareness on the different types of solid waste in Loikaw, Capital of Kayah State. The following objectives are considered to fulfill the aim of this research. To classify the waste materials from the houses in the town of Loikaw. To have the capacity regarding the knowledge of disposing the waste materials from the houses of the public living in Loikaw. To examine whether the town folks of Loikaw house sorted the types of waste materials before they throw them away.

## Previous Works

To explore the level of public awareness regarding solid waste disposing, many scholars have already conducted in different areas. The awareness about disposal of solid waste and its impact on both natural and human environment was examined in Bangladesh by Department of Environmental Science and Resource Management. In Manila City (the Philippines), the study has been tackled the problem of waste and how it should turn into something that would benefit the community and awareness of how individuals and students could play an active role to the solutions. Randomly collected the primary data relating the level of awareness and practices of solid waste management was done in Zimbabwe by the Chinhoyi University of Technology. For the study area many scholars especially from Loikaw have ever done the academic researches. But, no one had emphasized on the topic about the solid waste disposal. That is why this paper was tried to fulfill the blank.

## Study Area

Loikaw, capital of Kayah State is located at 19° 40'17" North latitude and 97° 12' 34" East longitude. It is established by 19 wards. Up till the year 2010, Loikaw was established by (13) wards later in the year 2011, the wards of Nambawwan (A) and (B), Acre-500,

Nanattaw, Htaytama and Namkat wards were extended. In average, Loikaw lies (884) meters above the sea level. (Map-1) It has an area of 25.39 sq km.

### Data Collection, Organizing Facts and Methods Used

During the field survey, the candidates had visited (25) houses in each ward (quarter) and a total of 567 houses had been surveyed for the whole town (Map-2). The waste materials of the houses were discussed with the residents regarding the types of waste materials before they were disposed off. The methods of waste disposing are also inquired by the candidates. Moreover, it was asked about the residues from the kitchen and the wastes from the kitchen which are re-used or not.

With regard to the problems of disposing wastes from the residents, the candidates had visited each sample house in order to get and collect primary data. For some facts which are not available from the residents, the researchers had to go to the offices of the Governing Administrators of the concerned wards. After that, the collected data were described and shown by using graphs, such as line graph, column graph, etc. GIS method is also used when the visited houses are illustrated. Moreover, depending upon the field survey, SWOT (strength, weakness, opportunity, threat) analysis is used to evaluate the awareness level on dumping waste.

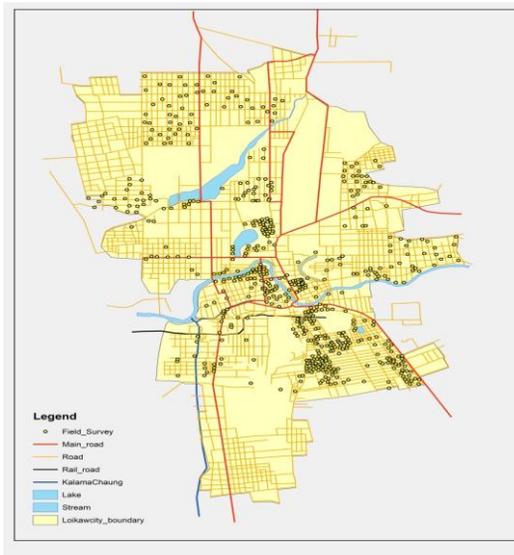


Figure 2. Sample Households for Interviewing

### Findings and Discussion

After the field survey of (567) houses in Loikaw Town, the candidates found that 100% households dumped all types of wastes consist of mixed with unclassified waste materials, plastics, waste from the kitchens and residues or remains of food. 47.97% of the interviewees collected pieces of paper, 41.09% sorted out broken pieces of glasses and bottles, for economic wastes and wasted from food shops and restaurants were sorted by 54.32% and 57.14 % had noticed the wastes of dried leaves found on roads.

17.11% of the respondents threw the wastes before sorting out the types of wastes, whereas after sorting out the types of waste materials, there was 50.09 %of the people (of 567) dumped the waste materials.

## Methods of Disposing Waste

Waste materials are sorted out and classified as those which are being used as fertilizers, those which are burnt; those wastes which are collected by the municipal waste materials collecting cars by ringing bell system. About 1.94 percent of the dried waste materials are used as fertilizers. About 4.44% of some waste materials are burnt and used as fertilizers. Some of the dried waste materials are not burnt but are kept piled up for a long time until they become decayed in order to be used as fertilizers. The disposal of the waste materials by using the ringing bell system is about 76.01%. The residues or remains of the food from the kitchen which accounted to 3.35% of the waste materials are used again. At the corner of the streets and roads, where the Government did not prohibit throwing the waste materials, the residents there, disposed of the waste materials piling up to about 3.35 %.

## SWOT Analysis

SWOT means Strength, Weakness, Opportunity and Threat. In disposing waste materials, points to be considered consist of systematic disposal, the strength and beneficial favourable points; the difficulties and weakness in disposing waste materials; the necessary required essential points and the opportunities to be maintained; the dangers and threats in disposing the waste materials should be considered. In this paper, this method is applied for each ward in the town. It also can lead to comparative study by one location to another.

### Waste Disposal Condition in Minsu Ward and Dawnokhu Ward

**Strength:** By means of the Ringing of Bell system of the Municipality the waste materials can be disposed regularly. The remains and residues of the food are re-used as food for animals. The dried leaves are not burnt. They are put in ditches and are dumped there in order to decompose naturally to become fertilizers for the plants or trees. As for the waste materials which are harmful, they are thrown into the dust bins. The waste materials are being sorted out before they are disposed of.

**Weakness:** The waste materials such as bottles and glasses are not re-used again. The dried leaves are not used beneficially.

**Opportunity:** If the Garbage collecting cars of the Municipality collect the waste materials frequently for many times along the road, those wards would be said that the awareness level is moderately high.

**Threat:** The numbers of the collection of the waste materials by the cars of the municipality are few. The dried leaves are piled by the side of the roads.

### Waste Disposal Conditions in Nanattaw Ward

**Strength:** This ward is a newly expanded ward with good transportation. The waste materials especially food residue are mostly re-used.

**Weakness:** The waste materials are not sorted out. Nearly all of the waste materials are burnt and are thrown away and disposed at illegal dump sites.

**Opportunity:** In that new ward, the Kayah people who speak Kayah language mainly are setting there. As a result, the information flow on awareness level could be easily distributed.

**Threat:** The waste materials are piled unlawfully by the side of the roads. The burning of the waste materials is not carried out according to set time.

### **Waste Disposal Condition at Namkut Ward**

**Strength:** As it is a newly expanded ward, the roads are very good and smooth to transport the wastes by municipal cars.

**Weakness:** The waste materials are not classified and sorted out. All the waste materials are burnt and are disposed randomly by the dwellers.

**Opportunity:** The garbage collecting cars could come frequently in order to collect the waste materials which need to be disposed.

**Threat:** The waste materials are piled and thrown unofficially by the road sides. As the burning of the waste materials are not carried on at the set time without giving the notice, it is dangerous for the people to meet with careless fire hazards.

### **Waste Disposal Conditions in Nambawwam (A)**

**Strength:** The Garbage Collecting Cars of the Municipality come to collect the waste materials twice a week. The pattern and shape of the wards are systematic and well planned, so that the municipal cars move easily and timely.

**Weakness:** The waste materials are not classified and sorted out by the residents.

**Opportunity:** The garbage collecting cars could come and collect the waste materials more frequently and more several times.

**Threat:** As the ward is very recently, defined as a town municipal area, the awareness level on waste dumping is still low. Moreover, there is only one main road which can be used for waste collecting by municipal cars.

### **Waste Disposal Conditions in Nambawwam (B)**

**Strength:** The waste materials are being collected regularly. Most of the waste materials are being re-used.

**Weakness:** The materials such as bottles and glasses are not re-used.

**Opportunity:** Waste dump sites are necessary to define by the concerned offices.

**Threat:** The waste materials are disposed unlawfully by the road side, as the bell-ring system served due to its remoteness.

### **Waste Disposal Condition in Nyaungyar (A)**

**Strength:** The Garbage Car of the Municipality collected the waste materials everyday. Moreover, the waste materials are not burnt by the residents.

**Weakness:** Every household does not sort out or classify the types of garbage before dumping.

**Opportunity:** Their awareness level on sorting and reused materials could be risen up in order to avoid the waste burning action.

**Threat:** The waste materials are thrown and disposed by the road side due to lack of awareness level.

### **Waste Disposal Condition in Nyaungyar (B)**

**Strengths:** As the people are working as the Public Service personnel's and are living in the Public Service quarters, the waste materials are not disposed and thrown without discipline. The garbage car comes daily to collect the disposed waste materials.

**Weakness:** There is still less awareness level on sorting out the types of wastes.

**Opportunity:** It seems to have improvement in the awareness levels of waste disposing.

**Treat:** Some households landfilled the wastes in their compound without sorting.

**Waste Disposal Condition in Dawookuu**

**Strength:** Municipal Garbage cars come everyday to collect the waste materials. Some waste materials are burnt.

**Weakness:** The waste materials are not sorted out and are not classified. It is necessary to dispose the garbages systematically.

**Opportunity:** Garbage collecting cars need to collect waste materials. Systematically conservation of environment can be improved in the community.

**Threat:** There is environmental pollution. In burning the waste materials, systematic setting of time should be carried on in order to prevent fire hazard and air pollution.

**Waste Disposal Condition in Dawtama Ward**

**Strength:** The Municipals Garbage Car used to come regularly.

**Weakness:** The waste materials are not sorted out. The waste materials are not re-used.

**Opportunity:** If the waste materials are sorted out, glass bottles and plastic water bottles could be re-used.

**Treat:** If the awareness level of the inhabitants would not be increased, it will lead to degrade both human and natural environmental.

**Waste disposal Condition in Mingalar Ward**

**Strength:** The Municipal Garbage Car comes to collect waste materials once a week. The waste materials are classified and sorted out. The garbages are re-used.

**Weakness:** Some waste materials are burnt and are destroyed.

**Opportunity:** The Garbaga Car could come frequently and quite often.

**Threat:** By burning the waste materials unlawfully without giving notice there is danger to the environment. During Summer time, burning of the waste materials should be carefully watched in order to prevent fire hazard.

**Waste Disposal Condition in Lawtama Ward**

**Strength:** The Municipal Garbage Collecting Car used to collect the waste materials daily, once in the morning and once in the evening. The dust bins are kept and the waste materials are disposed of systematically.

**Weakness:** The waste materials are not sorted out and are not classified. After throwing the waste materials into the ditches which are dug, the garbage was burnt. As there are poultry farms in that ward, and as the waste materials from the poultry farms are not disposed off systematically, there is pollution in the environment.

**Opportunity:** If the waste materials are disposed systematically it will better to stay in that ward to have awareness level.

**Threat:** By burning the waste materials unofficially without giving notice to the ward, there can be danger to the environment.

**Waste Disposal Condition in Htaytama Ward**

**Strength:** The Municipal Garbage Collecting Car comes twice a week to collect the waste materials of the ward. The waste materials are classified and are sorted out before they are disposed.

**Weakness:** The Waste materials are burnt. Such type of waste as glass and plastic bottles are not re-used.

**Opportunity:** It is necessary for the Municipal Garbage Collecting car to come and collect the waste materials quite often or frequently.

**Threat:** As the burning of the waste materials is carried out unofficially without giving notice to the Ward, there is danger to the environment. Great should be taken in burning the waste material during summer when there is hot dry weather.

#### **Waste Disposal Condition in Bardoh Ward**

**Strength:** The waste materials are re-used. The dried leaves are burnt and are used as fertilizers.

**Weakness:** The waste materials are not classified and are not sorted out before they are burnt.

**Opportunity:** It is very essential and necessary for the Municipals Garbage collecting car to come to the ward in order to collect the garbage or trash.

**Threat:** As the burning of the waste materials are carried out unofficially without giving notice to the public of the ward, there is danger for the environment as well as for the ward.

#### **Waste Disposal Condition in Shwetaung and Shansu Wards**

**Strength:** The Municipal Garbage Collecting car comes to collect the garbage of the wards twice a week.

**Weakness:** Some houses do not keep the dust bins and throws the waste materials into the streams and canals.

**Opportunity:** It is necessary for the Municipal Garbage collecting car to come and collect the garbage punctually.

**Threat:** By burning the disposed waste materials, there is pollution in the environment. Moreover by disposing and throwing away the waste materials into the streams and canals, it is harmful for the town folks and urban public.

#### **Waste Disposal Condition in Damaryone Ward**

**Strength:** The Municipal Garbage collecting car used to come to collect garbage. Some waste materials are re-used.

**Weakness:** The waste materials are not sorted out and are not classified before dumping.

**Opportunity:** It is necessary for the municipal garbage collecting car to come and collect the waste materials once on every other day.

**Threat:** As some houses are burning the waste materials it can threaten the environments for pollution of air and for fire hazards.

#### **Waste Disposal Condition in 500-Acre Ward**

**Strength:** The Municipal Garbage Collecting Car used to come and collect the waste materials regularly. The waste materials are classified and sorted out before disposing them.

**Weakness:** The waste materials are burnt and are disposed unsystematically.

**Opportunity:** It is necessary for the Municipal Garbage collecting cars to come and collect the waste materials regularly.

**Threat:** As the disposed waste materials are burnt, there is danger to the environment for pollution and fire hazard.

## **Result**

This paper tries to find out the awareness level of town dwellers at Loikaw regarding types of solid waste, classification, ways of disposing etc.

To meet the objectives of the research, the following characters of the people are considered to define the awareness level of the urban dwellers: Sorting out character, Waste burning

character, Unlawful disposing character, Recycled or reused character. Throughout the study area, it could be observed that total 576 households had low awareness level on one or another character which are resulted from the SWOT analysis. For example, in Minsu and Dawookuu wards, the awareness level on sorting character is comparatively, high to another ward, where the awareness level on reuse character was rather low. The following table and Figure ( 1 & 2 ) show the different characters of awareness level on the solid waste for 16 wards out of 19.

**Low Awareness Level on:**

No.	Sorting	Burning Waste	Disposed on Illegal Sites	Recycled or Reused
1.	Nantbawwan (A)	Nanthutt	Narnattaw	Minsu
2.	Nantbawwan (B)	Mingalar	Lawdama	Dawnokuu
3.	Dawookuu	Lawdama	Shwetaung	Nantbawan (B)
4.	Dawdama	500-Acres	Shansu	Htayatama
5.	Bardoo			
6.	Damayone			

Based on the primary data of field survey (May, 2017)

Figure 1. Low Awareness Levels on the Solid Waste Disposing According to the Urban Wards in Loikaw.

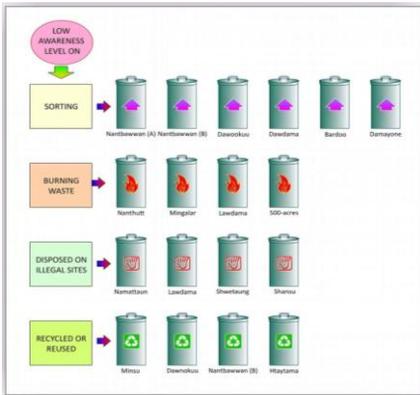
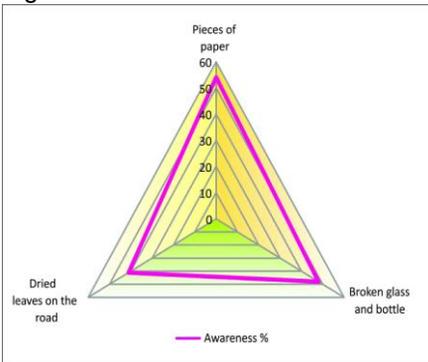


Figure 2. Awareness Level on Different Solid Wastes by the Urban Dwellers in Loikaw



## Conclusion

Loikaw was originally established and set up with 13 wards. Later, 6 wards were being added to the town as expanded area. Along with the urban expansion area, the population has been increased. Automatically, the waste production by houses has been a great problem for the policy making and management. The town dwellers demanded to rise up the number of waste collecting cars and to collect the wastes more frequently than before. Moreover, the burning waste should be paid more attention by the local people. If such management on waste dumping would be systematic, the sustainability on the clean town would be expected.

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