ISSUES AND CHALLENGES

SOLID WASTE DIPOSAL

CASE STUDY OF TOURIST PLACES

MANALI-KASOL-SOLANG

CONTENTS

ISSUES AND CHALLENGES

FRAGILE ECOSYSTEM

UNPLANNED & SHORT-TERM DEVELOPMENT AGENDAS LEADS TO INCREASE IN INDUSTRIALIZATION & URBANIZATION LED TO TONS OF SOLID WASTE KEPT IN DUMPYARDS AND REMAIN UNTREATED

CHALLENGES:

ROUGH TERRAIN

SCARCE LAND

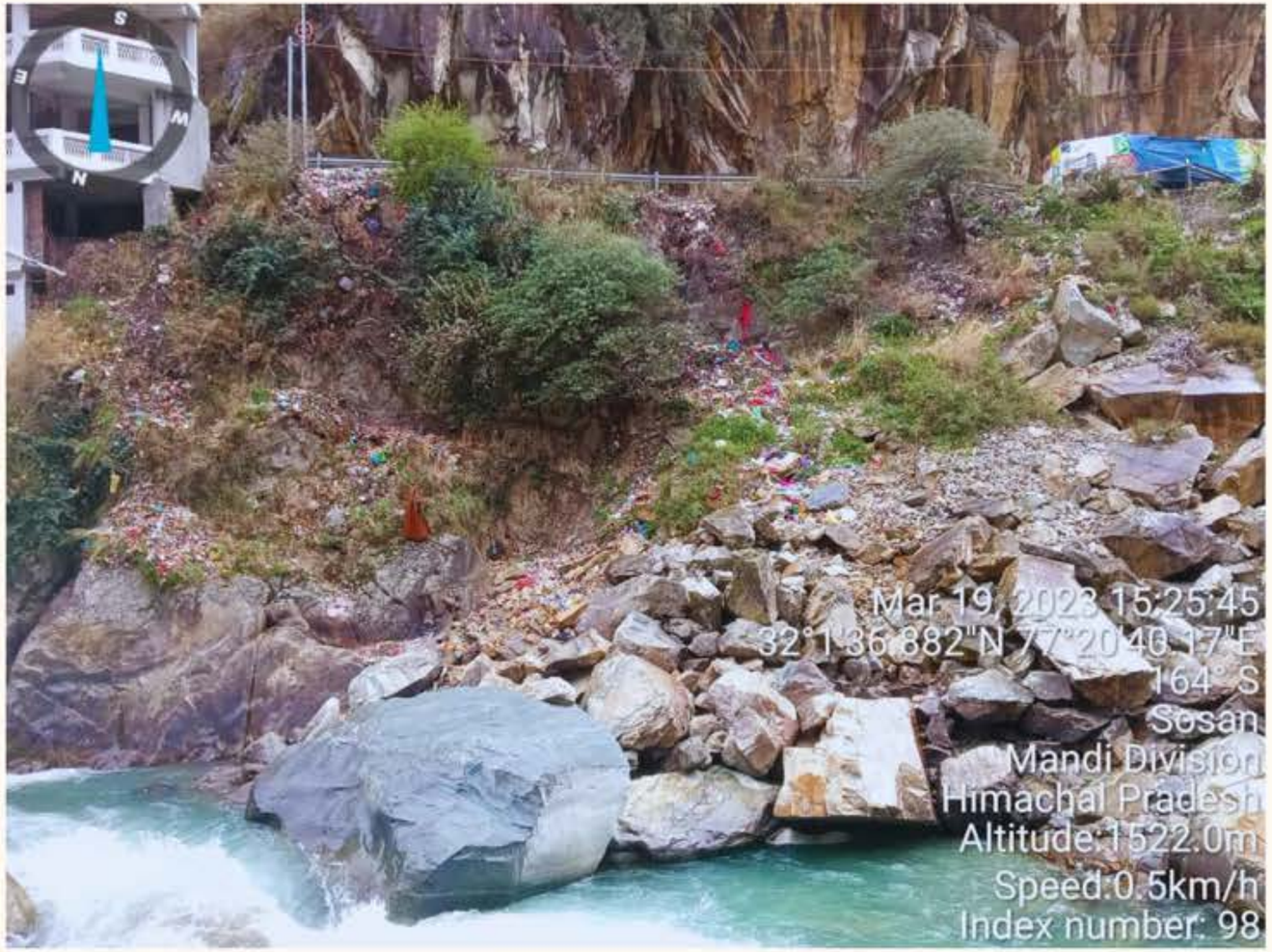
LACK OF RESOURCES

THREAT TO EXOTIC BIODIVERSITY & SERENITY OF HIMALAYAS

WITH THE SHIFT FROM OFF SEASON TO ON SEASON THE WASTE GENERATION INCREASE WITH THE INCREASE IN TOURISM ACTIVITIES AND CONSUMERISM

ISSUES CONCERNED:

TOURISM
SEGREGATION
DIFFICULT TERRAIN
TECHNICAL ISSUES
FINANCIAL ISSUES
INVOLVEMENT OF UNORGANISED SECTOR


Mar 19, 2023 15:25:45
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164° S
Sosan
Mandi Division
Himachal Pradesh
Altitude:1522.0m
Speed:0.5km/h
Index number: 98

MANIKARAN


Mar 18, 2023 16:04:32
32°0'35.55"N 77°18'27.966"E
116° SE
Kullu
Mandi Division
Himachal Pradesh
Altitude:1518.2m
Speed:0.6km/h
Index number: 91

KASOL

SOLANG VALLEY

MANALI


N
W
E
S
Mar 17, 2023 14:46:47
32°15'35.166"N 77°11'16.35"E
2° N
MDR 29
Bashisht
Mandi Division
Himachal Pradesh
Altitude:1961.5m
Speed:2.5km/h
Index number: 9

BASHISHT

POSSIBLE SOLUTIONS:

- Cluster based approach.
- Recycling should be made compulsory for all ULBs.
- Bridging the gap between formal and informal sector
- Environment friendly and ecologically sound waste treatment techniques such as bioremediation, phytoremediation, etc. should be adopted.
- In order to curtail the water and soil pollution due to solid waste, dump yards should be identified after studying the geomorphology of the area, groundwater level, hydrology, flora, etc.
- Waste collection sur-charges should be made mandatory for every household for door-to-door collection.
- Enforcement and proper monitoring mechanism for Government policies and guidelines.

WHAT COMPRISES THE SOLID WASTE?

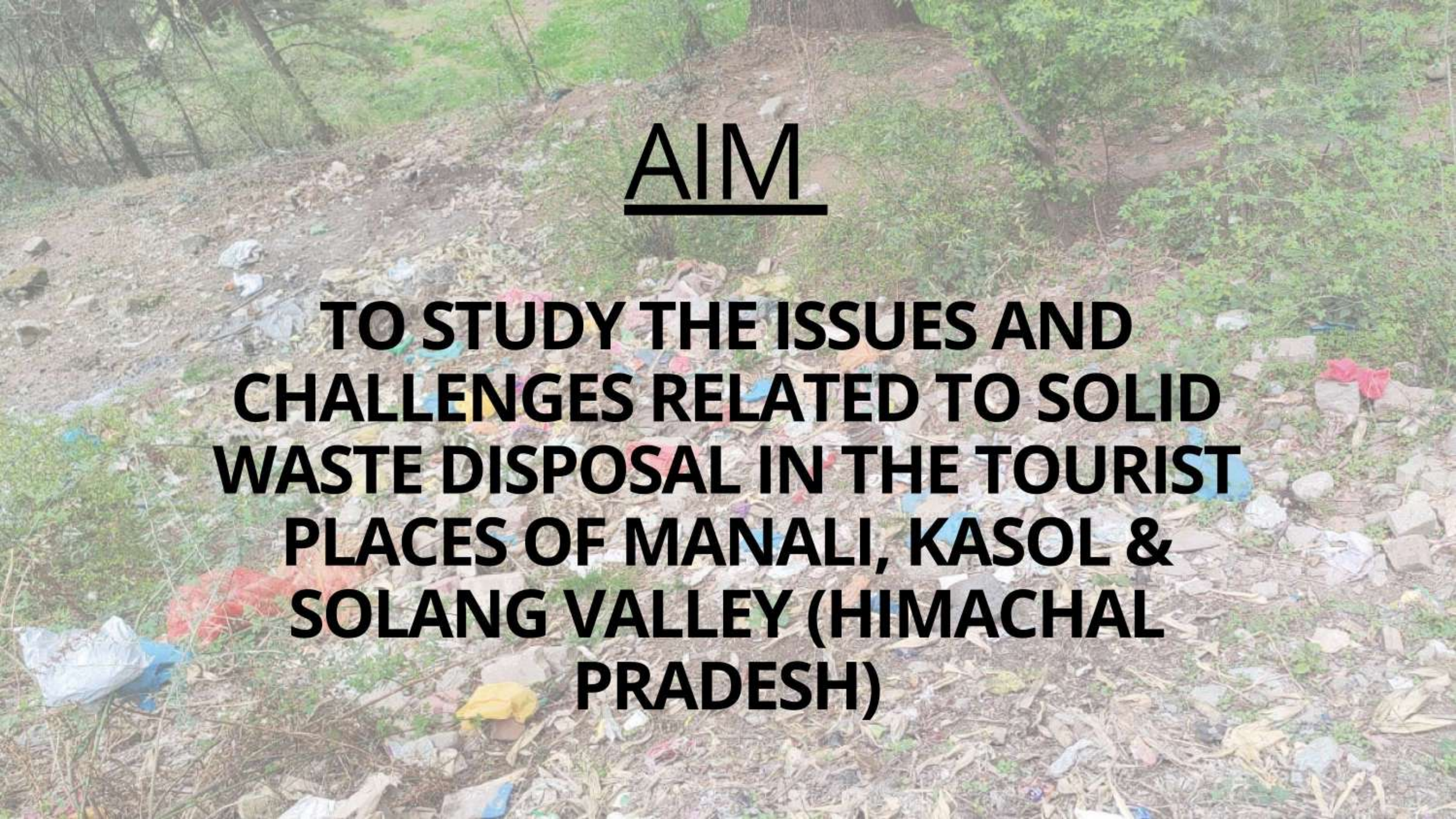
Solid waste includes:
discarded solid fractions, generated from domestic units, commercial establishments, trade centers, industries, agriculture, public spaces, etc.
Three Categories:

1. Origin (domestic, commercial, industrial, construction)
2. Contents (organic material, glass, metal, plastic paper, etc)
3. Hazard potential (toxic, non-toxic, infectious, flammable, radioactive, etc).

Municipal solid waste (MSW) accounts for 62 million tonnes annually in urban India (Planning Commission Report, 2014).
It also predicted an increase to 165 million tonnes by 2030.

RECENT GOVERNMENT INITIATIVES

1. Swachha Bharat Mission – Urban (SBM-U):
2. Swaccha Survekshan.
3. Swachhata Hi Sewa Campaign
4. Compost Banao, Compost Apnao Campaign

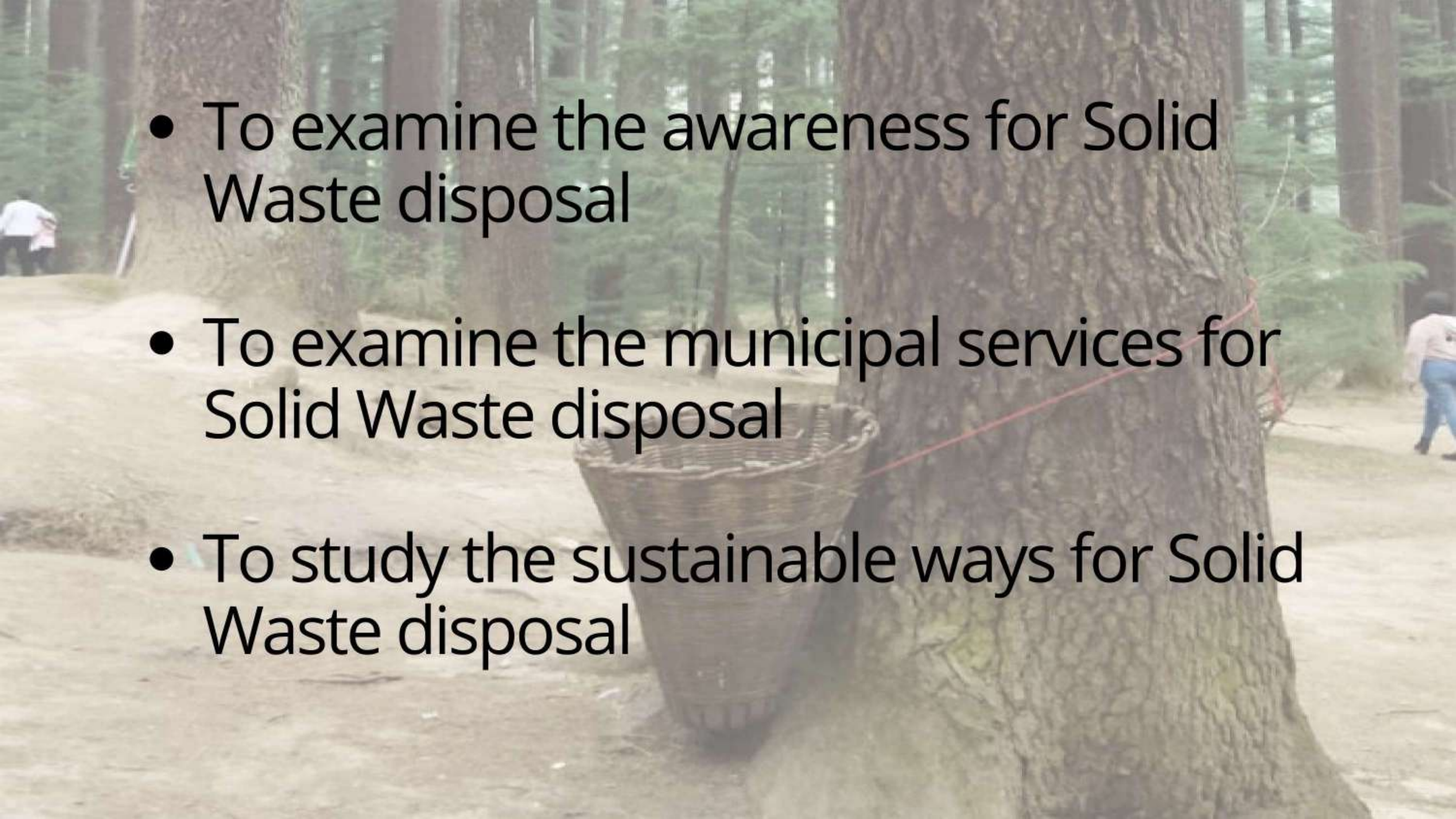


AIM

TO STUDY THE ISSUES AND CHALLENGES RELATED TO SOLID WASTE DISPOSAL IN THE TOURIST PLACES OF MANALI, KASOL & SOLANG VALLEY (HIMACHAL PRADESH)

OBJECTIVES

- To determine the status of Solid Waste disposed at present
- To determine the impact of Solid Waste on health



- To examine the awareness for Solid Waste disposal
- To examine the municipal services for Solid Waste disposal
- To study the sustainable ways for Solid Waste disposal

RESEARCH HYPOTHESES

As per our objectives, the following hypotheses were framed for testing:

- Improper management of solid wastes lead to spread of diseases
- Target audience of the research area are aware of the different methods of waste disposal; including the distinction between green & blue dustbins

- The people are satisfied with existing solid waste management practices

- There is a dominance of Ready Biodegradable (RBD) Waste amongst household of selected research area

Literature review

- To be precise, Literature review means studying, observing, critically analyzing the existing text with regard to the particular area or topic on which we are going to do any research or simply having a basic a basic idea of the work that has been before we do it. So a few literatures have been reviewed before we started.

- Matrix method for evaluation of existing solid waste management system in Himachal Pradesh, India
- Anchal Sharma, Rajiv Ganguly & Ashok Kumar Gupta
- *Journal of Material Cycles and Waste Management* **volume 20**, pages1813–1831 (2018)

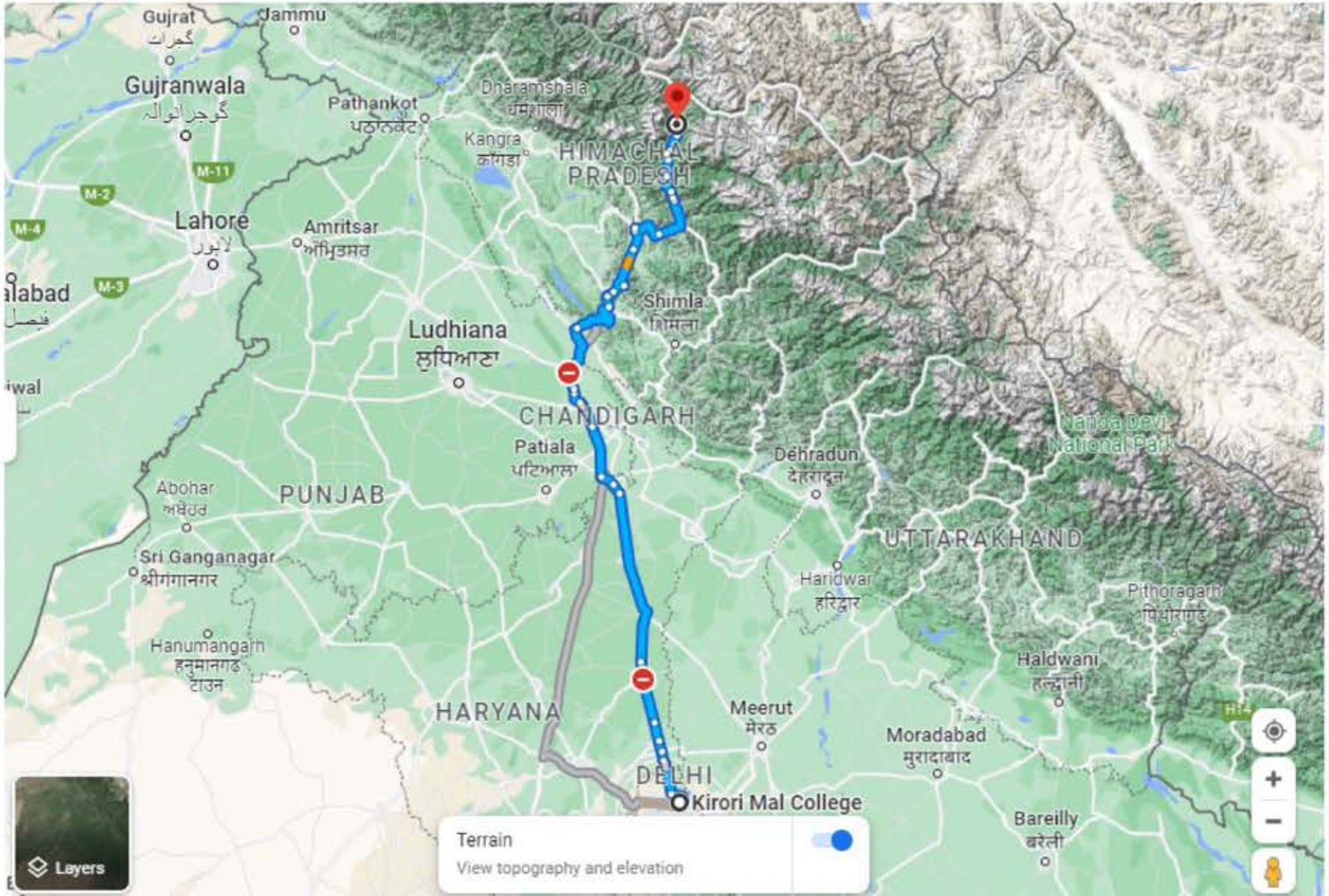
- Comparative Analysis of Solid Waste Management Processes in Himachal Pradesh and Punjab
  Anchal Sharma, Rajiv Ganguly & Ashok Kumar Gupta
- Conference paper

- Comparative Analysis of Solid Waste Management Processes in Himachal Pradesh and Punjab
  Anchal Sharma, Rajiv Ganguly & Ashok Kumar Gupta
- Conference paper

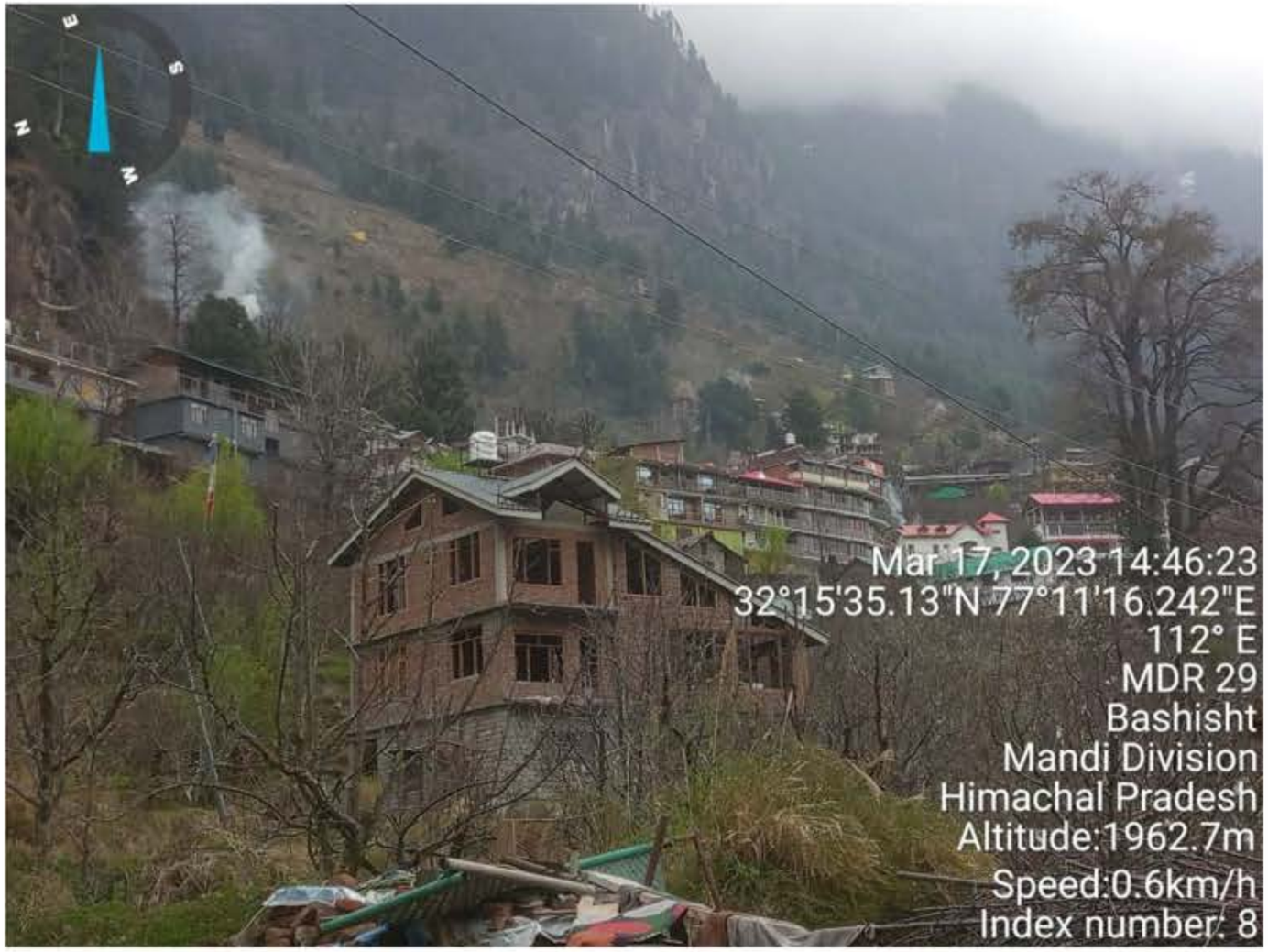
Transit Study

Transit study, also known as transportation geography (sub-discipline of geography) focuses on the study of transportation systems and their relationship with human and physical geography. It examines the spatial patterns and interactions of people, goods, and information through various modes of transportation, such as road, rail, air, and water.

Map


Gujrat
گجرات
Jammu
Gujranwala
گوجرانوالہ
Pathankot
पठानकोट
Dharamshala
धर्मशाला
Kangra
कांगड़ा
HIMACHAL PRADESH
M-11
M-2
M-4
M-3
Lahore
لاہور
Amritsar
अमृतसर
alabad
فیصل
Shimla
शिमला
Ludhiana
ਲੁਧਿਆਣਾ
iwal
CHANDIGARH
Patiala
ਪਟਿਆਲਾ
Nanda Devi National Park
Dehradun
देहरादून
Abohar
अबोहर
PUNJAB
UTTARAKHAND
Sri Ganganagar
श्रीगंगानगर
Haridwar
हरिद्वार
Pithoragarh
पिथौरागढ़
Hanumangarh
हनुमानगढ़ टाउन
Haldwani
हल्द्वानी
HARYANA
Meerut
मेरठ
Moradabad
मुरादाबाद
DELHI
Kirori Mal College
Bareilly
बरेली
Layers
Terrain
View topography and elevation

- We can observe the route of travel through this transit map and the topographic change or the terrain pattern can also be observed till the last point of Punjab(Roopnagar district) it was a plain area but as soon as we entered Himachal Pradesh we were in the mountains.
- The cultural change that I noticed first was the density of settlements, roads and housing pattern.


E
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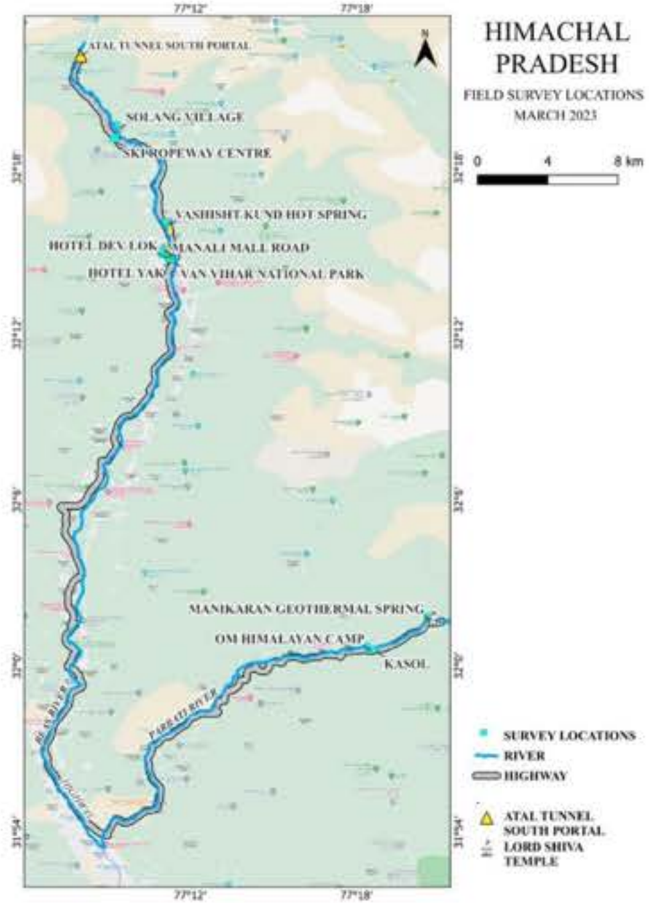
W
N
Mar 17, 2023 14:46:23
32°15'35.13"N 77°11'16.242"E
112° E
MDR 29
Bashisht
Mandi Division
Himachal Pradesh
Altitude:1962.7m
Speed:0.6km/h
Index number: 8

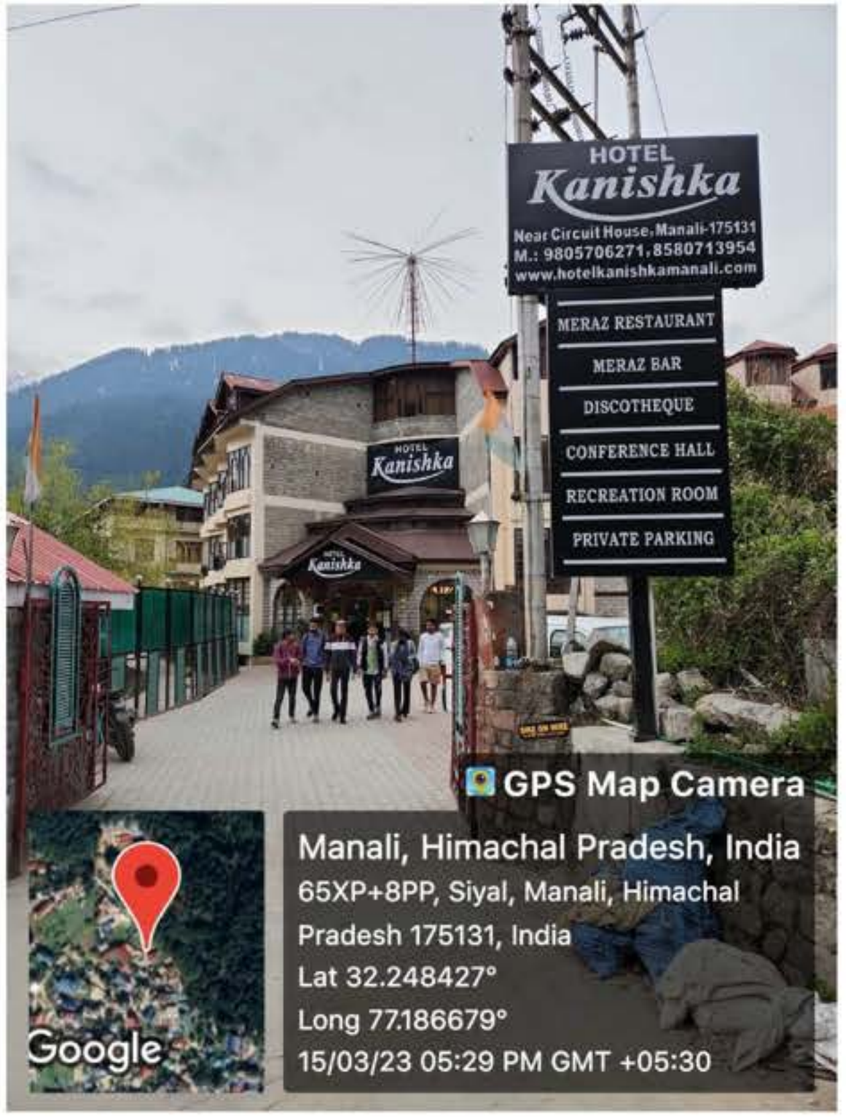
Transit Map of Himachal Pradesh covering all the places of our visit



Participant's Observation

- Our Participants were from Diverse backgrounds obviously in terms of occupation, status and many other things.
- Hence, we also got diverse responses.
- My first observation was that Education was a big factor because those who were educated, were giving it in a very synthetic way.
- While those who were less educated or illiterate their way of response was quite different and not synthetic any how but they also tried best of their ability to give what we asked for.


FAST FOOD CORNER
RAJMASH CHAWAL *KADI CHAWAL
GPS Map Camera
Manali, Himachal Pradesh, India
Shop No 135 Opposite Hadimba Temple, Old Manali, Manali, Himachal Pradesh 175131, India
Lat 32.247568°
Long 77.181795°
15/03/23 03:47 PM GMT +05:30
Google


HOTEL
Kanishka
Near Circuit House, Manali-175131
M.: 9805706271, 8580713954
www.hotelkanishkamanali.com
MERAZ RESTAURANT
MERAZ BAR
DISCOTHEQUE
CONFERENCE HALL
RECREATION ROOM
PRIVATE PARKING
GPS Map Camera
Manali, Himachal Pradesh, India
65XP+8PP, Siyal, Manali, Himachal Pradesh 175131, India
Lat 32.248427°
Long 77.186679°
15/03/23 05:29 PM GMT +05:30
Google

- This was the first place that we visited for the survey purpose, it was in the proximity of Ghatotkach temple.

- Although it was a small eatery and its owner was also intermediate only but yet he and the other workers were well aware about the solid waste practises and different dustbins.

Rohtang Manalusu (HPTDC)

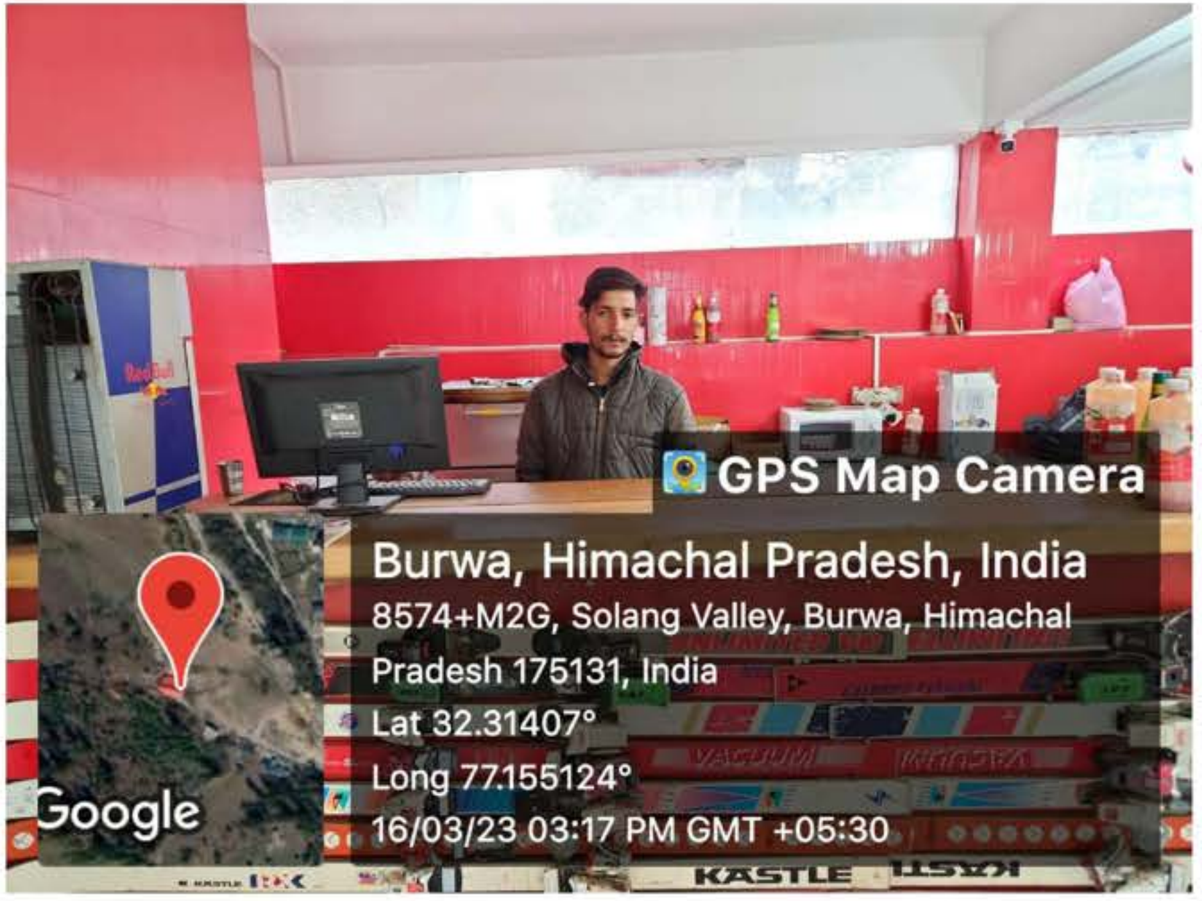
- It was a govt undertaking just near the Hadimba temple in old Manali, and its management was excellent in all the terms also it was one of the few resorts which was having its own compost plant .
- It was also noteworthy that its authority also allowsplantother hotels to use its compost plant.
- Its staffs and incharge also informed us that we during the time of snow fall we face some some difficulties in composting the waste.

- In the solang valley, the condition was different to that of Manali,also there was large no of migrants from nepal and other states who were working there and and the locals were the residents of nearby villages.

- They were less aware about the waste disposal techniques, segregation and all that.

Kanchan Naag temple

Skiing centre



- In terms sanitation it, the degree of the level of awareness was less than manali.
- Also, during the period of pandemic, the condition of the dwellers of solang was more severe than manali and kasol.

FIELD TOOLS USED DURING FIELD SURVEY


ETHICS IN FIELD WORK
Pre field survey ethics
Ethics during field survey
Post field survey ethics

ETHICS THAT WE APPLIED

PRE FIELD SURVEY

- We selected basic and specific topic.
- We have done extensive literature review.
- Formation of clear and concise research objective.
- We developed those working hypothesis which we expected as results from survey.
- We chose the site which vested the interest of majority that is Manali - Kasol - Solang.

AT TIME OF PREPARING QUESTIONNAIRE

- We used the simple language
- We maintained our questions in appropriate order.
- Include the contingency question where ever feel necessary.
- Availability of other options where answer may not match the given multiple choices.

ETHICS DURING FIELD SURVEY

- Appropriate data collection method : personal interview ,for gather detailed information.
- We targeted diverse participants to obtain diversify responses.
- Informed consent + telling purpose.
- We were flexible in sense -- we believed that in first instance whatever participants say is true.
- Avoid emotional harm to participants reputation.
- we respected norms & indigenous culture, nature.
- kept systematic record of data material.
- Maintain honesty & discipline in all stages.

POST FIELD SURVEY ETHICS

- conversion of raw data into organized tabulation and diagram forms.
- PRIVACY & CONFIDENTIALITY
- No plagiarism.
- analysis through statistical (qualitative & quantitative, coding)measures.
- Tried to minimize subjectivity in interpretation.

" **ETHICS MAKE OUR RESEARCH SYSTEMATIC, LOGICAL, EMPIRICAL & REPLICABLE."**

DATA COLLECTION METHODS– PROS AND CONS

- Data collection is the process of gathering and measuring information on variables of interest, in an structured way that enables to answer stated research questions, test hypotheses, and evaluate outcomes.
- The goal for all data collection is to capture qualitative and quantitative data that then translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed.
- The data is mainly collected from 2 sources – Primary Sources and Secondary Sources .
- The type of data that is collected in survey is mainly of two types – Qualitative data and Quantitative data .
- Qualitative Data - Mostly non-numerical and usually descriptive or nominal in nature. In the form of words and sentences. Often such data captures subjective perceptions of something.
- Quantitative Data - Numerical in nature and can be mathematically computed. Quantitative data measure uses different scales, which can be classified as nominal scale, ordinal scale, interval scale and ratio scale .

Methods Used For Collecting Data

- The methods used for collecting data included different sources . Like when we were on trip , the data that we collected were mostly of type of primary data but while we are making the report and analysing the trends and graphs we are using secondary sources of data .
- Primary Data is basically the first hand data collected by the investigator in field whereas secondary data basically refers to data that has already been published by a person or organisation . All these sources have their own advantages and disadvantages .
- There are various sources of primary data as well as secondary data used for data collection Sources are mentioned below –

PRIMARY SOURCES	SECONDARY SOURCES
Questionnaire	Literature Review
Schedule	Databases
Interview	Published census
Observation	Related Articles

Primary Sources Data -

- Although there are many primary and secondary sources available but some limited sources are used by us on trip and in making report . We will be discuss the demerits and merits of these two sources .
- Primary sources used for data collection are –
  1. Interview Through Questionnaire
  2. Observational Methods .

INTERVIEW THROUGH QUESTIONNAIRE

An interview is basically a conversation for gathering information. A research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions . The interview is an important data gathering technique involving verbal communication .

Interviews are an appropriate method when there is a need to collect in-depth information on people's opinions, thoughts, experiences, and feelings. Interviews are useful when the topic of inquiry relates to issues that require complex questioning and considerable probing.

- Interviews can be designed differently depending on the needs being addressed and the information. They can be grouped into three types –

    1. Structured Interview
    2. Semi – Structured Interview
    3. Unstructured Interview

a) Structured interviews: In a structured interview, the interviewer asks a set of standard, predetermined questions about particular topics, in a specific order .

b) In a semi-structured interview, the interviewer uses a set of predetermined questions and the respondents answer in their own words. There can use a topic guide that serves as a checklist to ensure that all respondents provide information on the topics that we want to know .

c) In an unstructured interview, the interviewer has no specific guidelines, restrictions, predetermined questions, or list of options .

The type of interview that we conducted during trip was a sort of mix of Structured and Semi – Structured Interview .

Fig – 1

He is a local vendor in Solang to whom we went for the questionnaire .

Pros and Cons of Interview

PROS

- Allows researcher to prompt interviewee by providing a set of example responses
- Specific data related directly to research topic is easy to obtain .
- The researcher can ask further questions to gain more in-depth information . In personal interaction clarifications and explanations can be made
- Allows researcher to collect people's ideas, opinions, values and beliefs about a certain topic . Very flexible method.

Cons

- Language constraint and not being able to convey what researcher wants to .
- Getting free, frank responses from the target population is not a easy task. Establishing proper rapport with the target group is very difficult requirement
- It is a very time consuming as well as very expensive method especially when the target population is big in number and widely spread over a geographical area.
- Information received from this method is difficult to analyse .

Personal Experiences of Interview –

- Whenever we try to complicate the process of interview by stating from where we are and what is the purpose of talking to them , according to my personal experience in most of cases they refuse to take part .

  But if we just simply try to casually talk to them casually at first and then convince that they have no risk in sharing the information then , they tell something extra and more informative about themselves and environment .
- The second thing that I experienced was that there was difficulty in conveying our message properly .

- There is use of **Dichotomous scale** in the questionnaire where they are given 2 and 3 options to interviewee. Below is a question in our questionnaire which has dichotomous scale.

Here is an audio clip of a respondent who knows well about his surrounding .

OBSERVATION METHOD

- Observation has been defined as “the selection,recording and encoding that set of behaviour concerning an organism which is accordance with empirical aims”. Literally, observation is way of gathering data by watching behaviour, events, or noting physical characteristics in their natural settings .
- Different kinds of data that could be collected on the field are:
  a) detailed description of the setting such as the physical environment,
  b) social environments such as the ways in which human beings interact with each other .

Pros and Cons

Pros

- Observation allows the researcher to study people in their natural setting/s without their behaviour being influenced by the presence of a researcher. Like about their solid waste practices , whether they use dustbins or not , use handbags or plastics .
- Allows you to directly see what people do rather than relying on other secondary sources .
- Helps to gain and understand the concept better .

Cons

- Can be expensive and time-consuming as compared to other data collection methods.
- Without having prior knowledge of the field that we are surveying we will not be able to truly fulfill our objectives .
- Describe the setting that was observed, describe the activities that took place in that setting. Enlisting those things and correlating them with each other is a complex one .


Mar 17, 2023 14:46:4
32°15'35.166" N 77°11'16.35
2°
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Bashis
Mandi Divisio
Himachal Prades
Altitude:1961.5
Speed:2.5km/
Index number:


GPS Map Camera
Manali, Himachal Pradesh, India
65WR+V8H New Beas Bridge - Manali, Beas Bridge,
Tibetan Colony, Manali, Himachal Pradesh 175103, India
Lat 32.247266°
Long 77.190693°
17/03/23 12:37 PM GMT +05:30
Google


CIRCUIT TRAIL : 1400 m
Don't Use
Plastic Bags
Wildlife Division, Kullu

SECONDARY SOURCES

1. Municipal Corporation website of Himachal Pradesh
2. Literature Review

Municipal Corporation Website

We have collected data of status and management of solid waste and their disposal processes from the website for the purpose of making field report .
It has categorised the waste data into various category like – Biomedical Waste , E-waste , Plastic waste current situation and the agencies who manages these wastes .

PROS –

- It gives us a official record and help to compare the status provided on the website to the people's opinions and experiences whether there is some conformity between the on ground and on paper report .

- It helps to know in detail of those things that we were not able to know through on ground like – Waste Transfer points , waste treatment and disposal , wet waste management and dry waste management .

CONS –

- In some cases it can be misleading or differed from on ground reality

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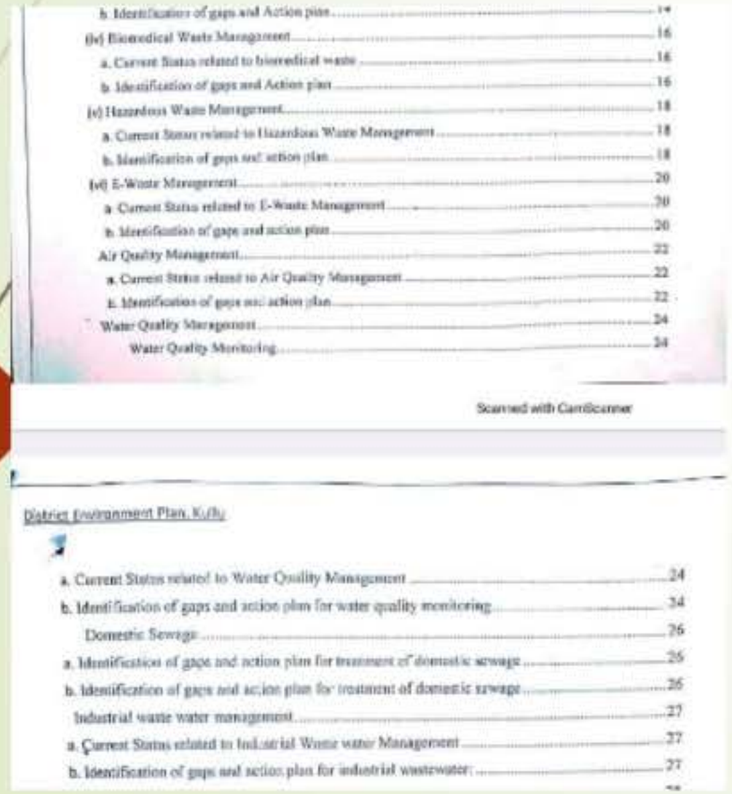
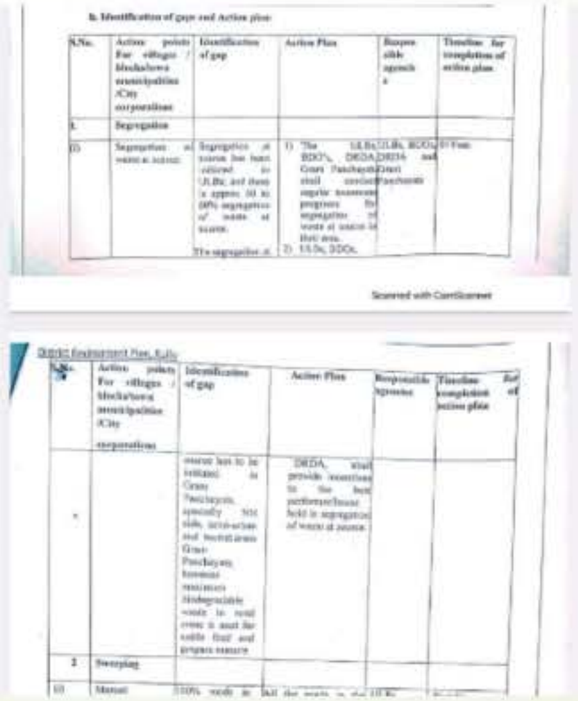
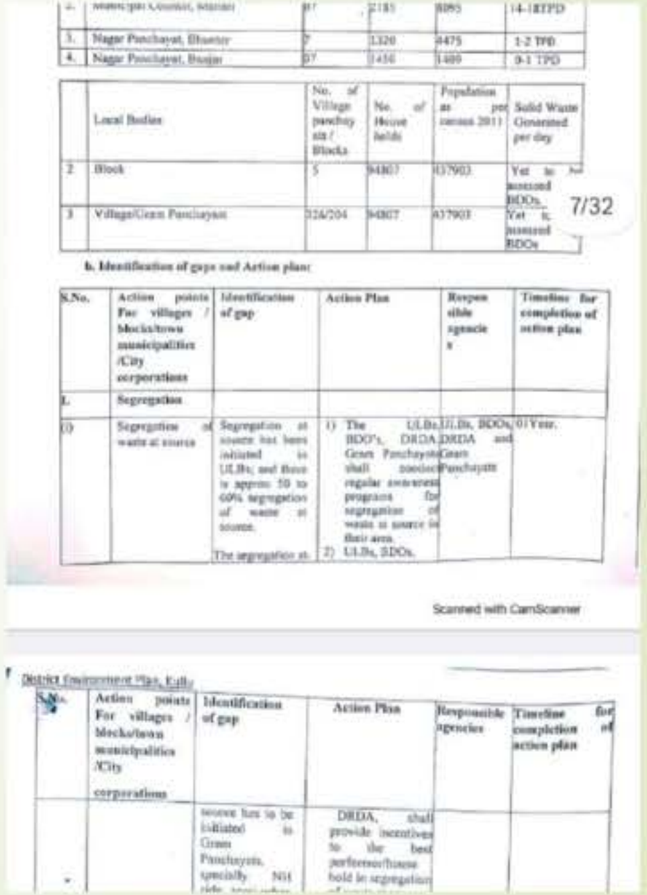






LITERATURE REVIEW

- It is a piece of academic writing giving understanding of the academic literature on a specific topic placed in context.
- There are various review of literature done by other people in depth with proper research methodology .

PROS –

- It helps to synthesize and draw conclusion about a report .Answers to questions that may affect the present scenario and not incorporated in questionnaire . It helps me to know about various diseases and types of plastics and their more severe impact which were unknown .

CONS –

- May be biased .

26th WEDC Conference Dhaka, Bangladesh, 2000

WATER, SANITATION AND HYGIENE: CHALLENGES OF THE MILLENNIUM

Solid Waste Management in Manali

A. P. Jain, S. Dhawan, N. R. Chaudhuri, A. Shannigrahi, Ramanpreet, India

MANALI IS A POPULAR hill resort of India located in state of Himachal Pradesh in north-western Himalayan region of the country. It attracts about a million tourists annually. As a result the town has a large number of hotels and floating population of the town touches a peak of about 35,000 against a fixed population of about 5000 residents during peak season.

Proper solid waste management has been a burning issue at Manali for sometime as the descretion of landscape was beginning to be noticed by large number of tourist visiting the place. Collection of waste has been a major constraint due to difficult hilly terrain. Disposal options are also limited as the land for disposal is hard to come by. Manali is a favourite summer resort for a large number of important decision makers and prominent citizens of India,

The characterisation outlines three separate components in the solid waste namely Ready Bio-degradables (RBD), Bio-degradables (BD) and Non-bio-degradables (NBD). The RBD fraction of waste is likely to degrade easily and is most suited to composting. The BD fraction of waste is theoretically degradable but the actual degradation under aerobic or anaerobic conditions depends on particle size and other favorable conditions etc. The NBD fraction does not degrade under any condition.

The Manali waste is clearly dominated by RBD fraction and about half of all waste is highly compostable. The NBD ranges from one-fourth to one third of total waste load and BD fraction accounts for one-fifth to one-fourth of all the wastes.

3. Objective

The objective of the MSWM strategy is to create waste free cities/towns and provide clean and pollution free environment in the entire urban areas of Himachal Pradesh.

4. MSWM Principles

- Highest Degree of Community Participation and community led management of MSW
- Segregation at source
- Waste to value through maximizing recycling
- Endeavour to achieve zero land fill status
- Scientific land fill
- Polluters to pay

5. Current Practices of SWM

There are total 54 ULBs and 6 cantonment boards with total of 7 lakh population in the state of Himachal Pradesh. No serious efforts were made in the State before year 2014 to either know the quantity or quality of the waste being generated in the state. However some efforts on waste audit have been made by GIZ in Shimla & Manali. Quality and quantity of waste generated in the state does not remain the same through all seasons but it shows steep variation during different seasons due to massive floating population the State of Himachal Pradesh receives due to touristic activities.

Waste Management (Residents)

- Waste generated by the households
- Organic waste carrying the majority weightage
- Awareness for proper waste disposal
- Apt knowledge and initiative of alternate methods of waste disposal
- Proper adherence of the rules and cooperation with respective authorities

Composition of Waste Generated

Bio-degradable:

- Food wastes
- Paper
- Cardboard
- animal waste

Non-Biodegradable:

- Glass
- batteries and other electronic wastes
- Plastic bags and cups
- waste metal objects

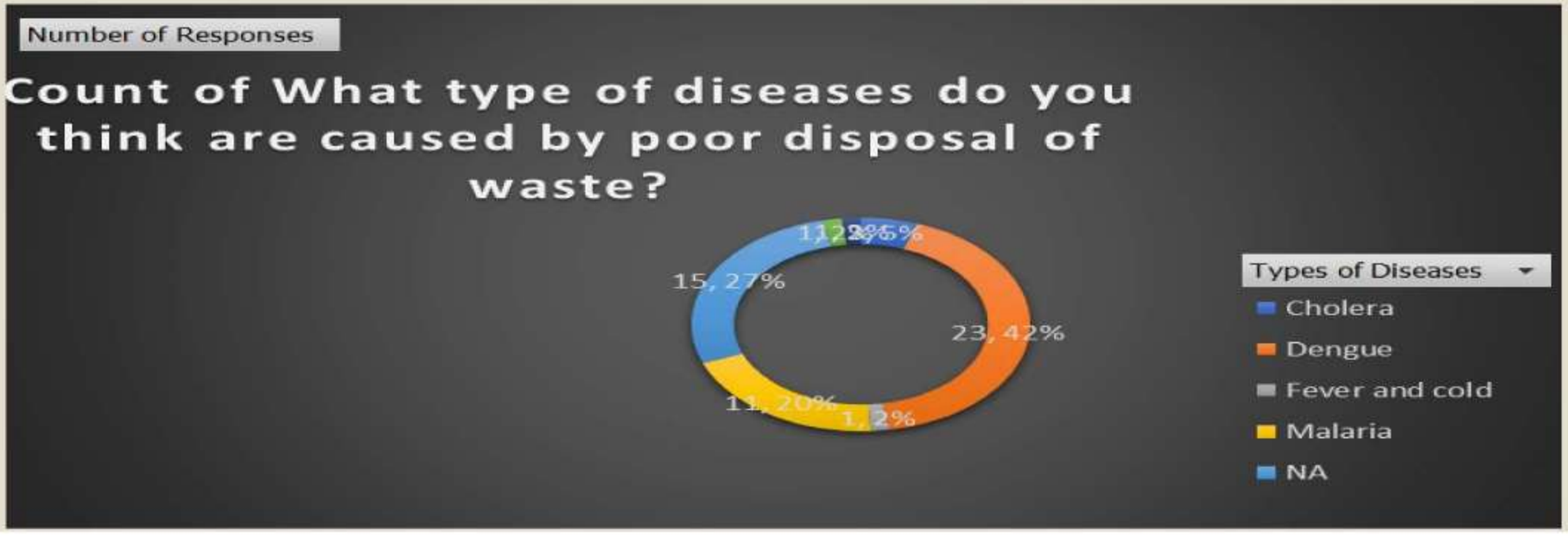
Authoritative Management

- Appropriately designated dumping sites for collective pick-up of household waste by the municipal vehicle
- Municipal Vehicle register every-day pickups
- Failed visits only during natural calamity or unexpected circumstances
- People have numerous way of disposing household waste in case of failed visits by authority vehicle for the designated cause.

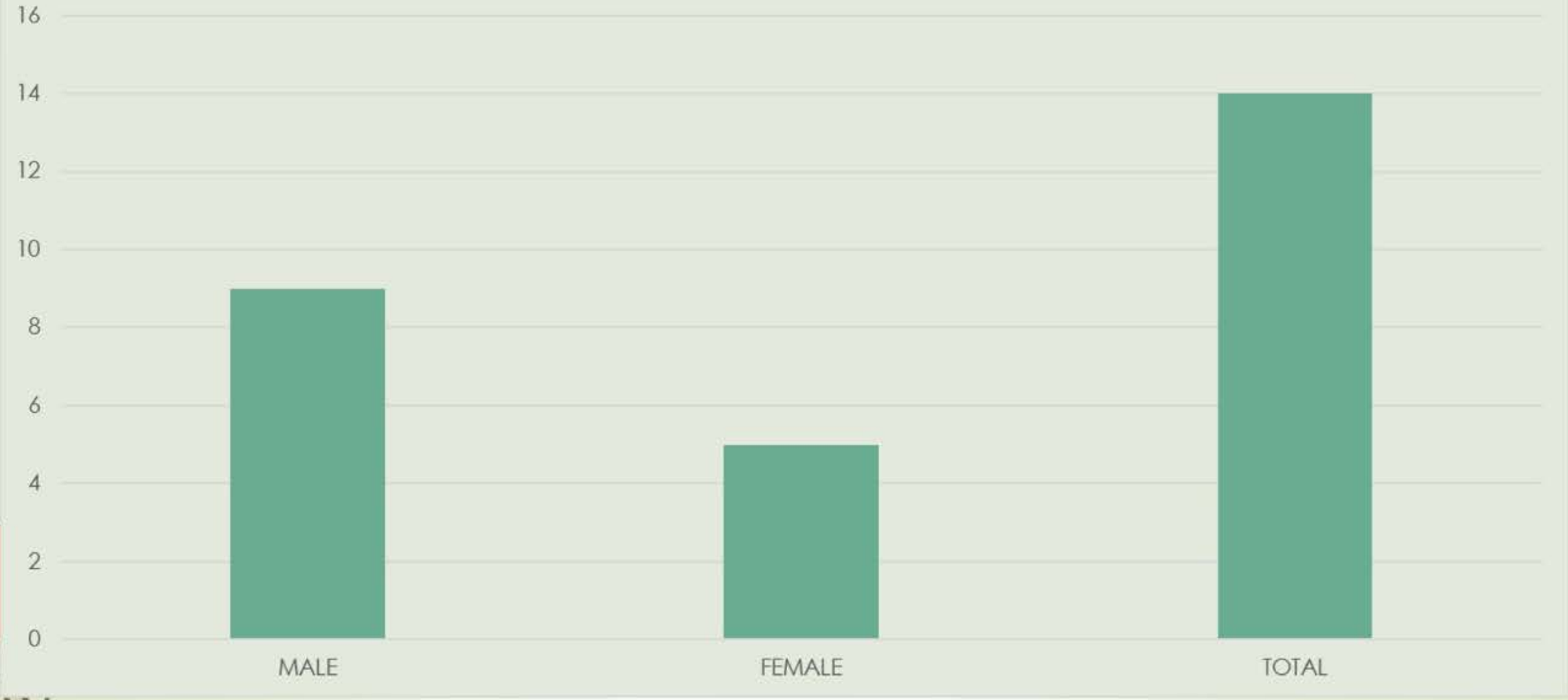
Effects Of Improper Waste Disposal

- Bad odor
- Irritation
- Skin Infections

Diseases:
- Cholera
- Dengue
- Fever and Cold
- Malaria
- Typhoid

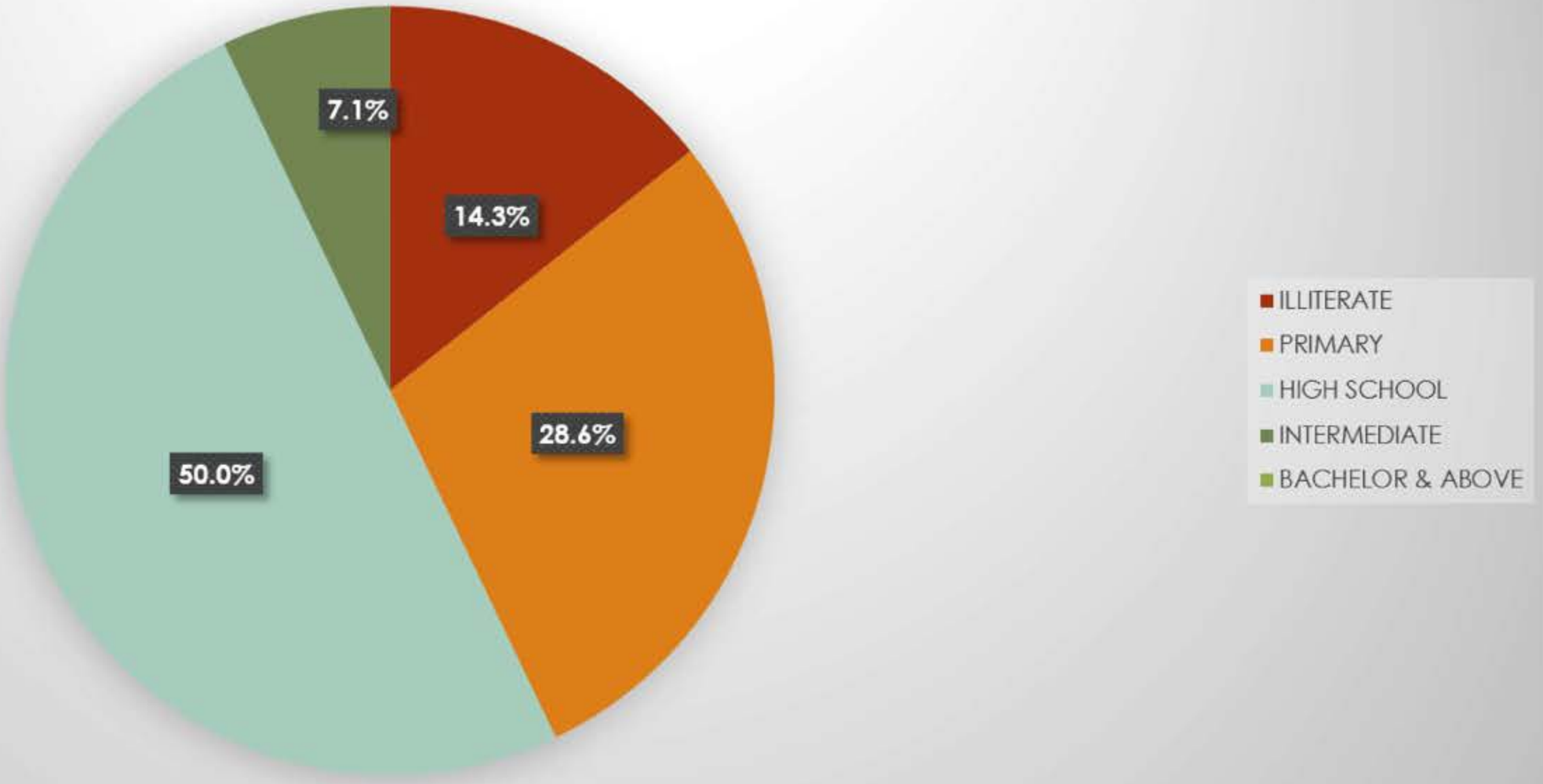


NUMBER OF RESPONDANTS



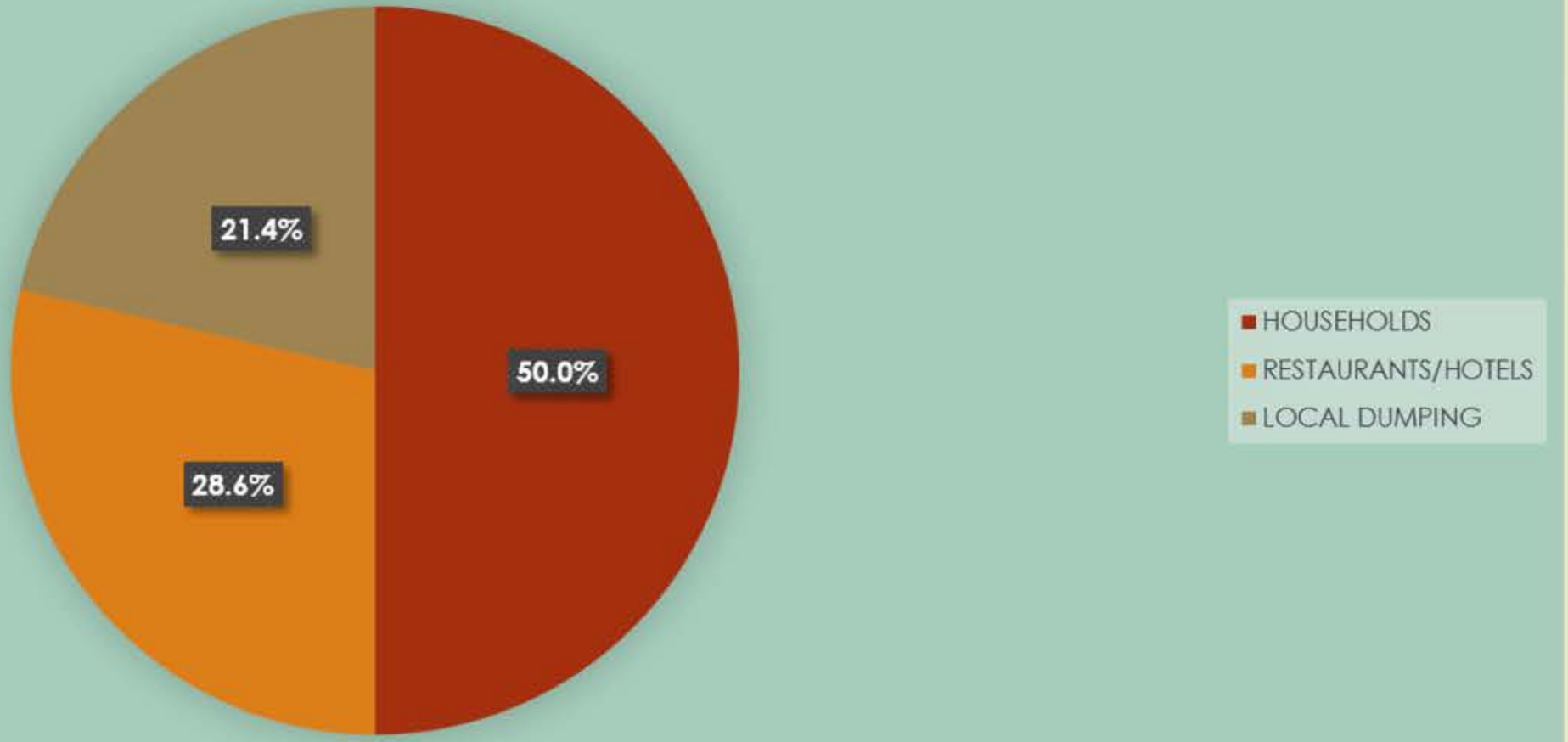
WE CAN OBSERVE IN THE ABOVE DIAGRAM THAT THE TOTAL NUMBER OF RESPONDANTS WERE 14 , AND FROM WHICH 9 WHERE MALE AND 5 WERE FEMALE.WE CAN CONCLUDE THAT NOT ONLY MALE BUT ALSO FEMALE ARE CONTRIBUTING IN MAXIMUM IN THIS SECTOR.

EDUCATION LEVEL



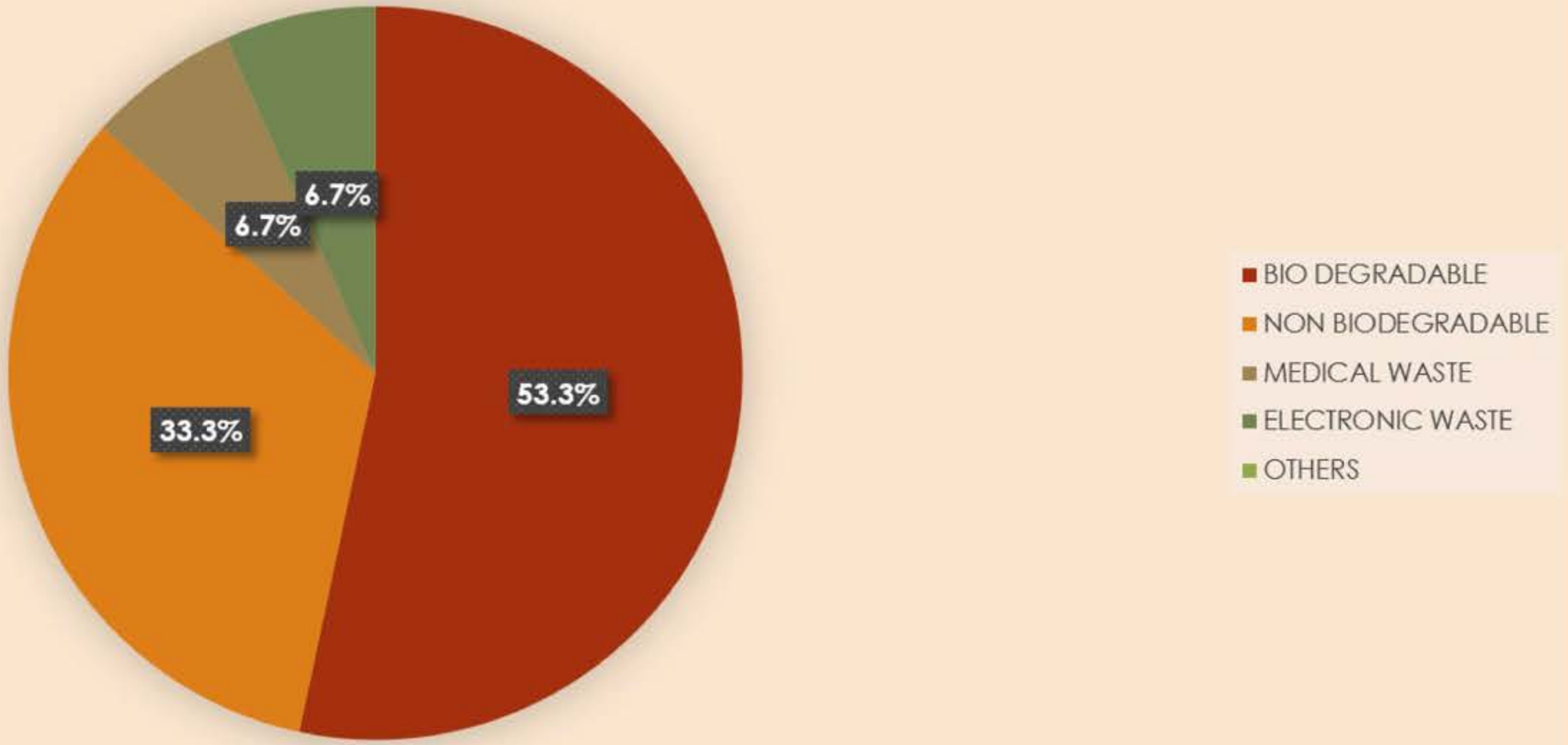
AS WE OBSERVE THEIR EDUCATION QUALIFICATION OF THE MUNICIPAL WORKERS WE CAME TO KNOW THAT MOST OF THEM ARE EDUCATED WHICH IMPLIES THAT THEY CAN PERFORM THEIR DUTIES EFFECTIVELY AND EFFICIENTLY. IT INDICATES THAT THE LOCAL GOVERNMENT IS ATTRACTING HIGHLY QUALIFIED AND MOTIVATEDINDIVIDUALS TO WORK IN MUNICIPAL SECTOR.

WHICH CONTRIBUTES HIGHEST WASTE COLLECTION



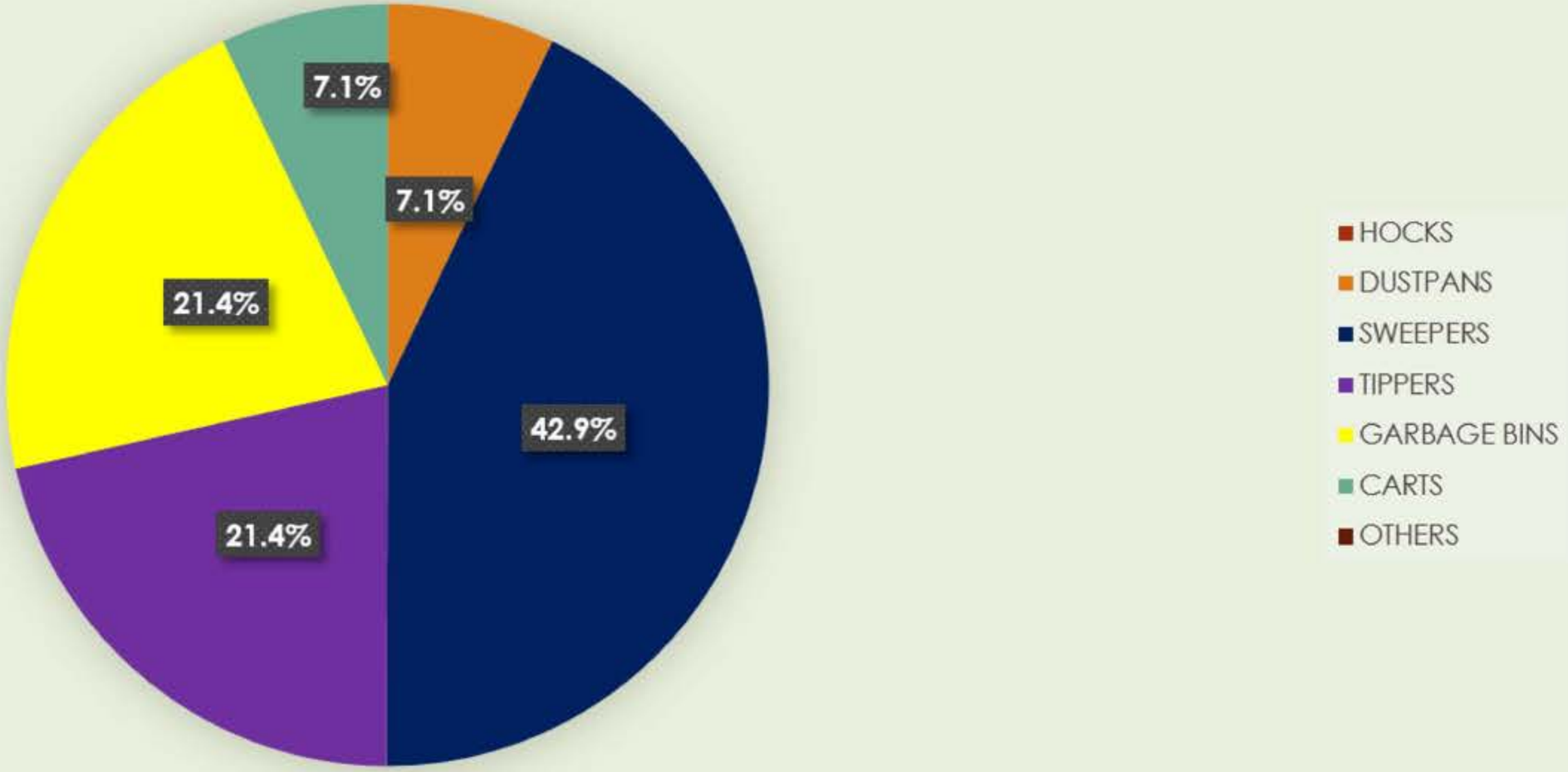
THE MAJOR CONCENTRATION OF WASTE IS GENERATED FROM HOUSEHOLDS WHICH CONSISTS OF MOSTLY BIO DEDEGRADABLE WASTE(FOOD WASTE, YARD WASTE,PAPER PRODUCTS).ALSO CONCENTRATION OF WASTE WHICH IS LOCALLY DUMPED IS ALSO HIGH THROUGH WHICH WE CAN CONCLUDE THAT THE TOURIST DESPITE OF DUSTBINS AVAILABILITY DO NOT DUMP IN IT .

WHICH CONSTITUTES MAJOR PROPORTION OF WASTE



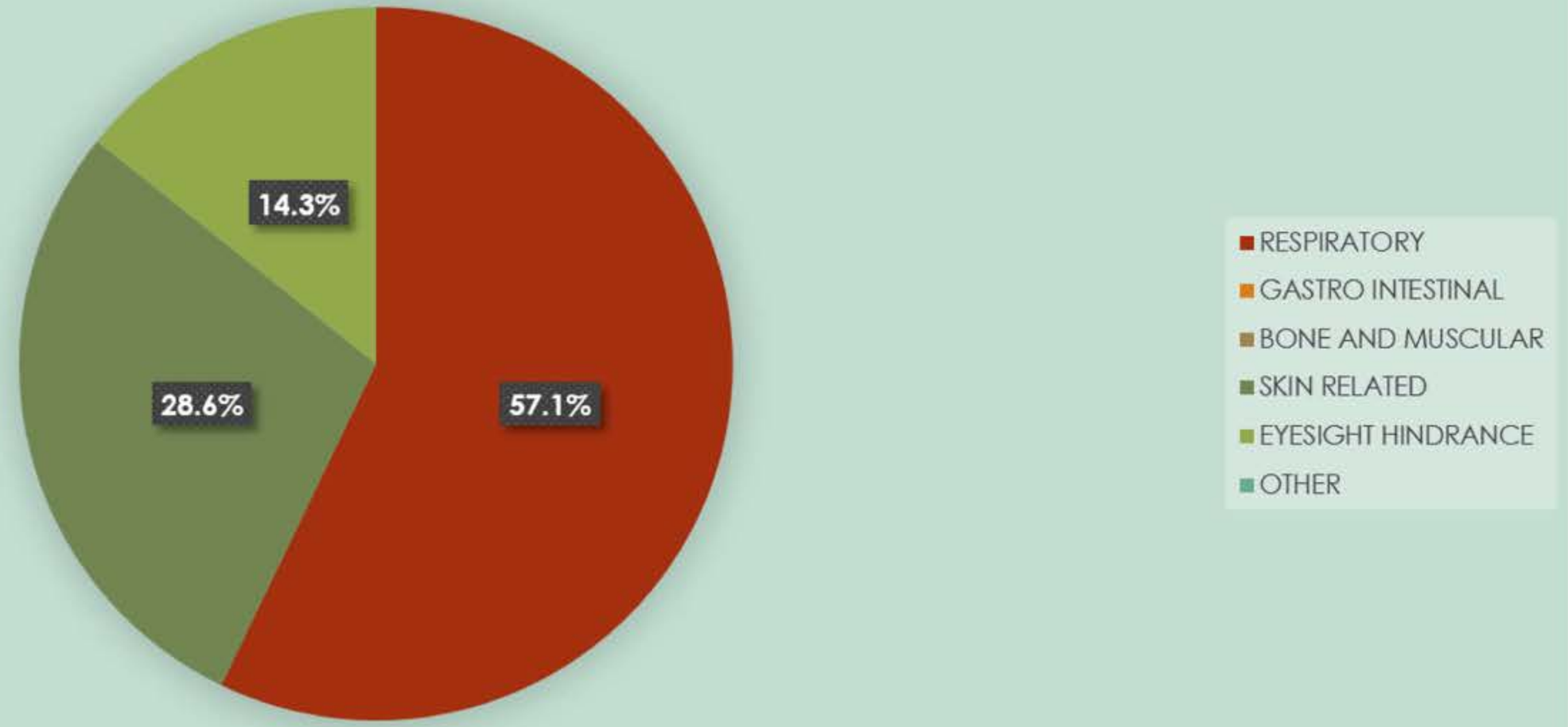
AS CAN BE OBSERVED FROM THE ABOVE DIAGRAM THAT MAJOR CONCENTRATION OF WASTE IS BIO DEGRADABLE WHICH IS MOSTLY COLLECTED FROM HOTELS/RESTAURANTS AND THE RESIDENTS LIVING IN THAT AREA.LARGE CONCENTRATION OF BIO DEGRADABLE WASTE MEANS IT CAN VE PUT TO VARIOUS USES LIKE COMPOSTING PLANT TO GENERATE BIO GAS.

TYPES OF SOLID WASTE EQUIPMENTS USED



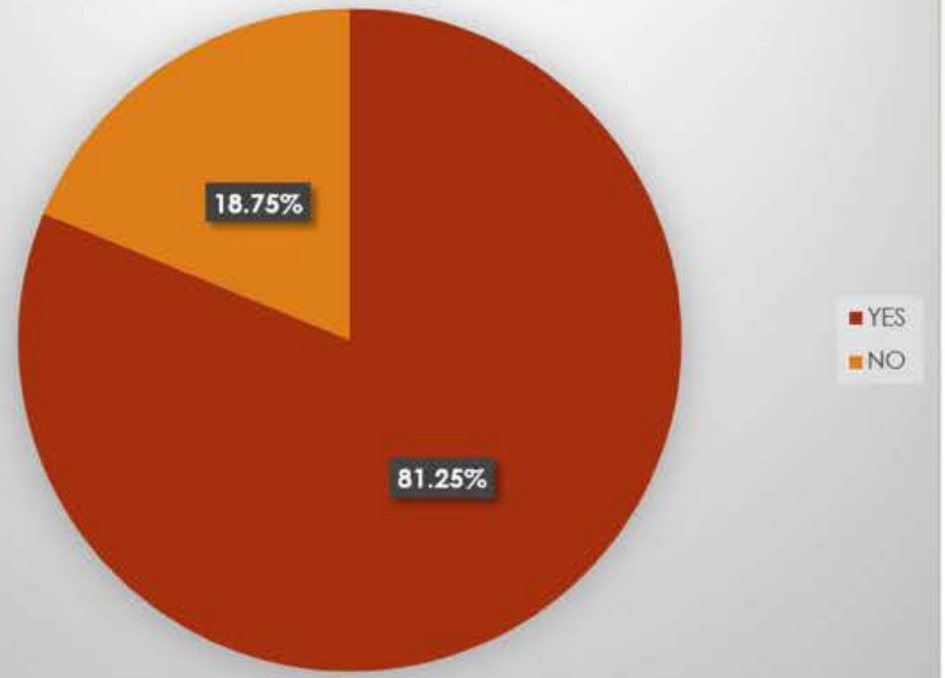
AS OBSERVED FROM ABOVE DIAGRAM MOSTLY THE WASTE WAS COLLECTED BY SWEEPERS THEN BY TIPPERS (A GARBAGE VAN/TRUCK WHICH COMES TO COLLECT THE WASTE FROM LOCAL DUMPING,HOTELS,RESTAURANTS AND THE RESIDENTS LIVING IN THAT AREA).

TYPE OF HEALTH PROBLEMS FACED

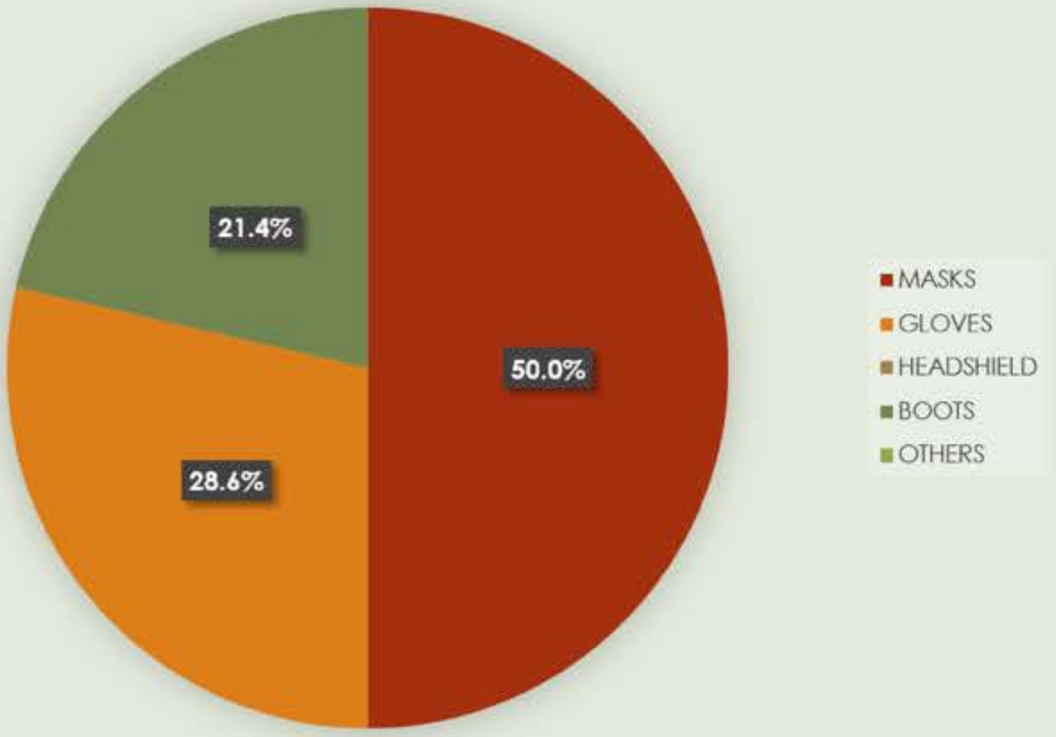


AS OBSERVED MOSTLY EVERYONE HAS FACED A HEALTH PROBLEM WHEN THEY INITIALLY JOINED THE JOB BUT LATER ON THEY BECAME USED TO IT. MAINLY THE HEALTH PROBLEMS THE WORKERS HAVE FACED IS RESPIRATORY DUE TO THE DUST AND ALSO SKIN RELATED DISEASES ARE ALSO PROMINENT IN THIS AREA LIKE SKIN BURNS,PIGMENT CHANGES ETC. THE WORKERS IS THEREFORE USING SANITATION METHODS MORE OFTENLY.

DO YOU WEAR ANY SAFETY GEAR ON FIELD

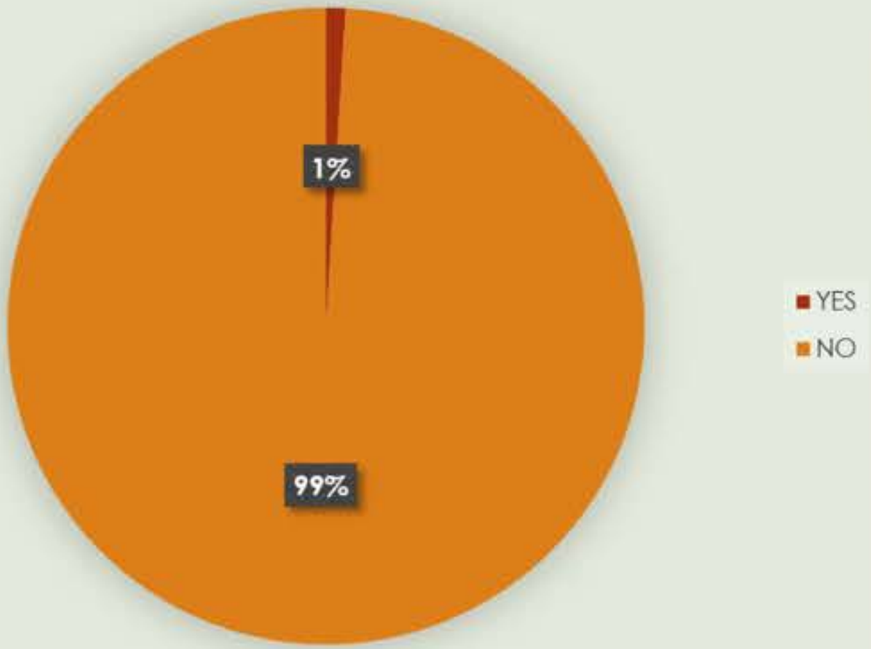


TYPES OF SAFETY GEARS USED

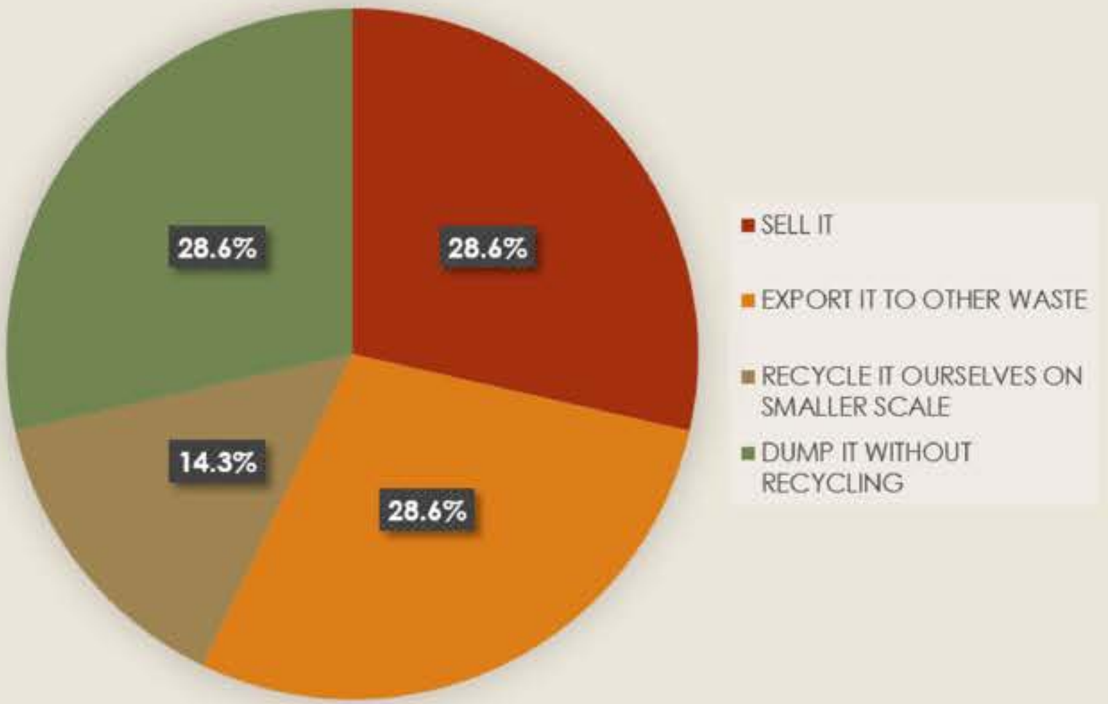


AS OBSERVED FROM THE ABOVE DIAGRAM THAT WHICH TYPES OF SAFETY GEARS THEY USE , SO ABOUT 50 PERCENT OF PEOPLE WEAR MASKS FOR PROTECTION FROM DUST,SKIN INFECTIONS AND MORE SERIOUS AILMENTS.WE CAN CONCLUDE THAT THE PEOPLE ARE AWARE ABOUT THE SANITATION MEASURES AND THEY ARE FOLLWING THE GUIDELINES.

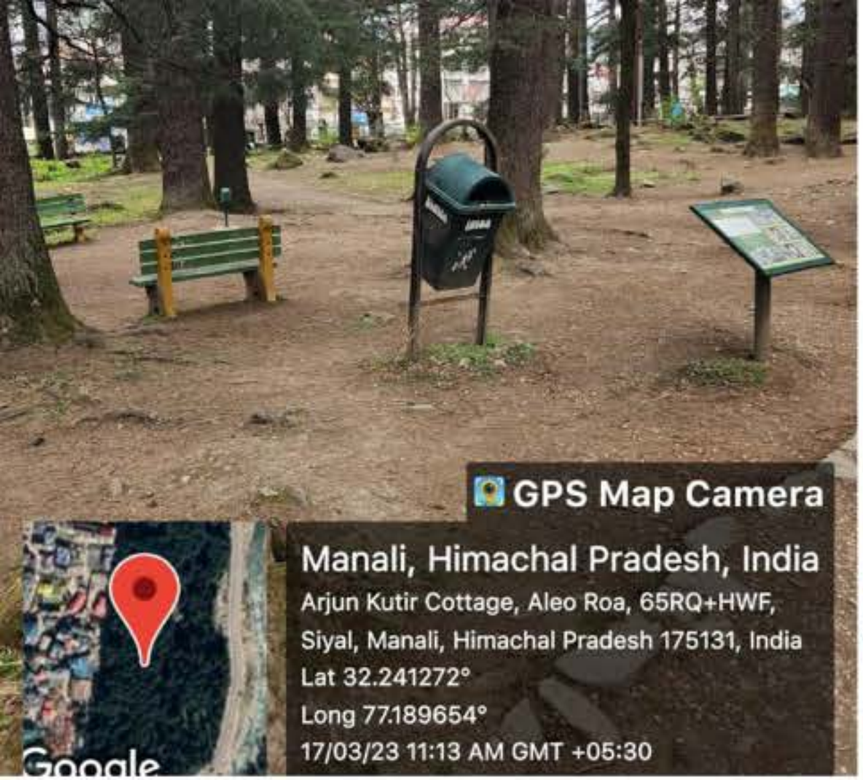
DO YOU HAVE ANY RECYCLING PLANT



WHAT THEY DO WITH RECYCLE WASTE



AS OBSERVED ONLY 1 RESPONDANTS HAD A RECYCLING PLANT OTHER PEOPLE WERE ASKED FOR WHAT THEY DO WITH THAT RECYCLABLE WASTE ,WE GOT A MIX RESPONSES THAT SOME OF THEM RESPONDED THAT THEY SEGREATE THE RECYCLABLE WASTE AND TRY TO SELL IT OR EXPORT IT OTHER RECYCLABLE PLANTS.AND SOME OF THEM SAID THAT THEY DUMPED IT IN OPEN GROUND WITHOUT RECYCLING IT .

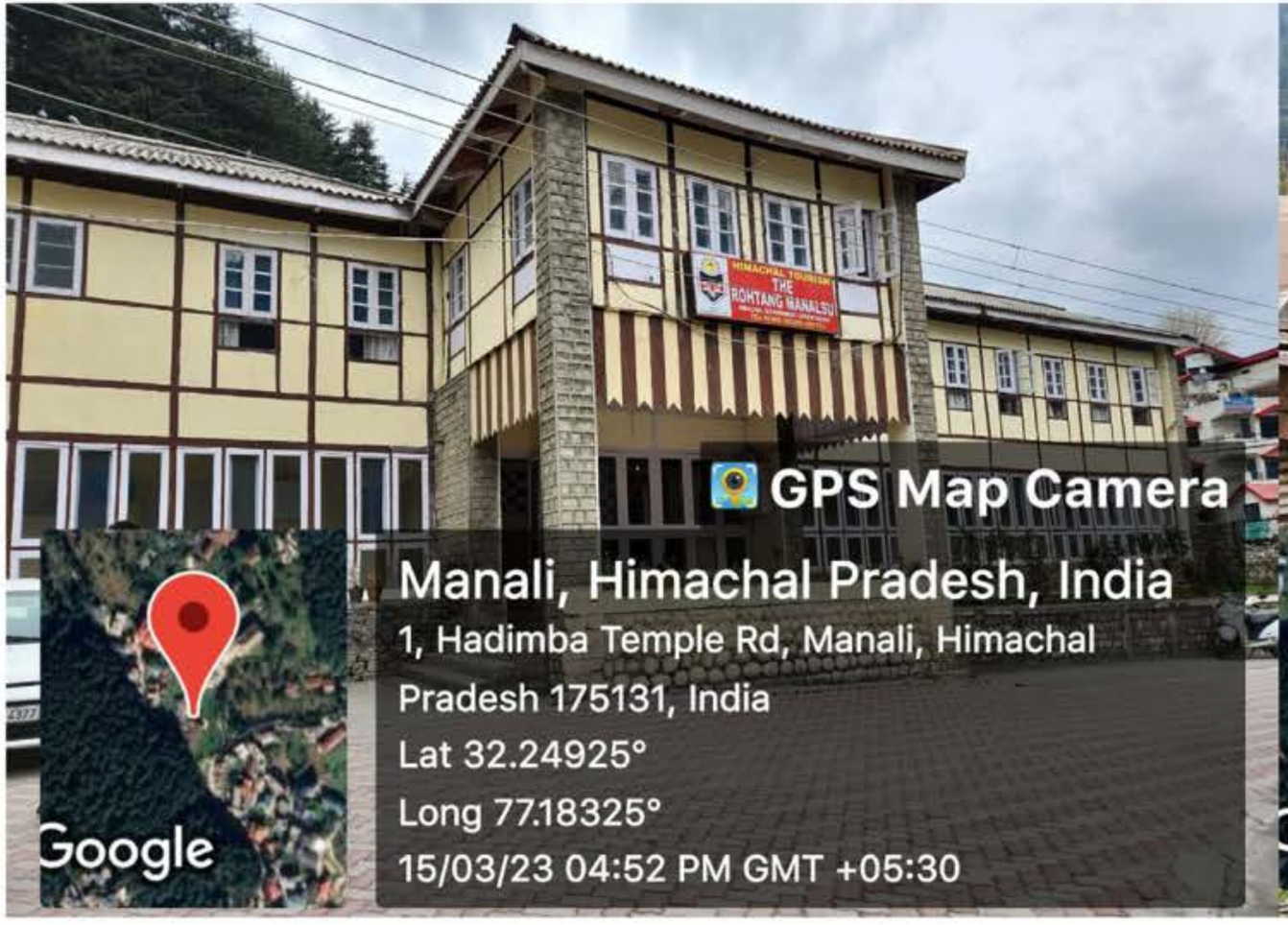

GPS Map Camera
Manali, Himachal Pradesh, India
Arjun Kutir Cottage, Aleo Roa, 65RQ+HWF, Siyal, Manali, Himachal Pradesh 175131, India
Lat 32.241272°
Long 77.189654°
17/03/23 11:13 AM GMT +05:30
Google

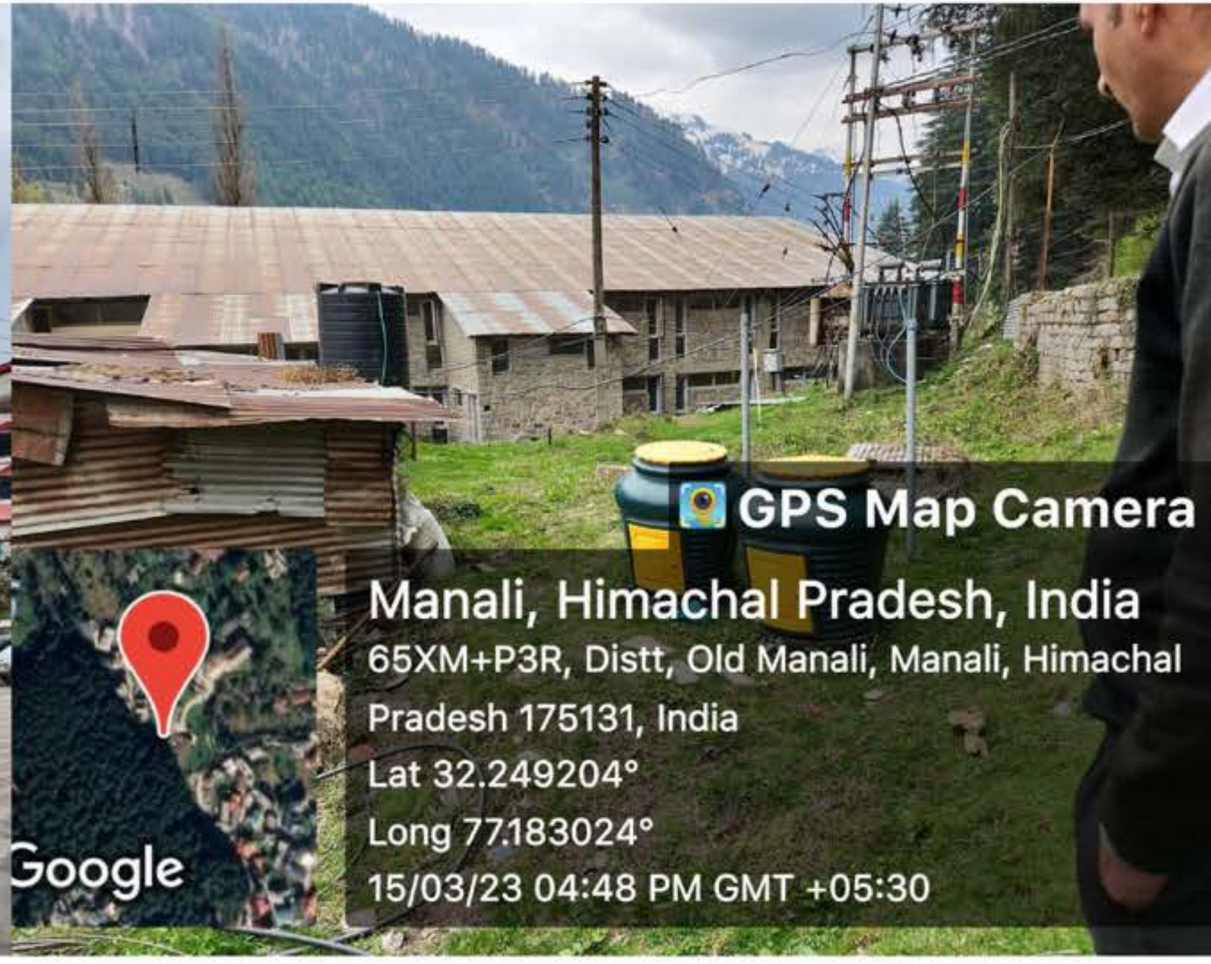

FAST FOOD CORNER
RAJMASH CHAWAL *KADI CHAWAL
GPS Map Camera
Manali, Himachal Pradesh, India
Shop No 135 Opposite Hadimba Temple, Old Manali, Manali, Himachal Pradesh 175131, India
Lat 32.247568°
Long 77.181795°
15/03/23 03:47 PM GMT +05:30
Google


Near Circuit House, Manali-175131
M.: 9805706271, 8580713954
www.hotelkanishkamanali.com
MERAZ RESTAURANT
MERAZ BAR
DISCOTHEQUE
CONFERENCE HALL
RECREATION ROOM
PRIVATE PARKING
HOTEL Kanishka
GPS Map Camera
Manali, Himachal Pradesh, India
65XP+8PP, Siyal, Manali, Himachal Pradesh 175131, India
Lat 32.248427°
Long 77.186679°
15/03/23 05:29 PM GMT +05:30
Google


Hotel
Dev Lok
GPS Map Camera
Manali, Himachal Pradesh, India
Circuit House Road, 65XM+7H7, Hadimba Temple Rd, Siyal, Manali, Himachal Pradesh 175131, India
Lat 32.248118°


Sharma Food Corner
BREAKFAST LUNCH SNACKS DINNER 100% PURE VEG. FOODS
GPS Map Camera
Manali, Himachal Pradesh, India
65XP+Q79, opp. Circuit House Road, Siyal, Manali, Himachal Pradesh 175131, India
Lat 32.249482°
Long 77.185567°
15/03/23 05:08 PM GMT +05:30
Google





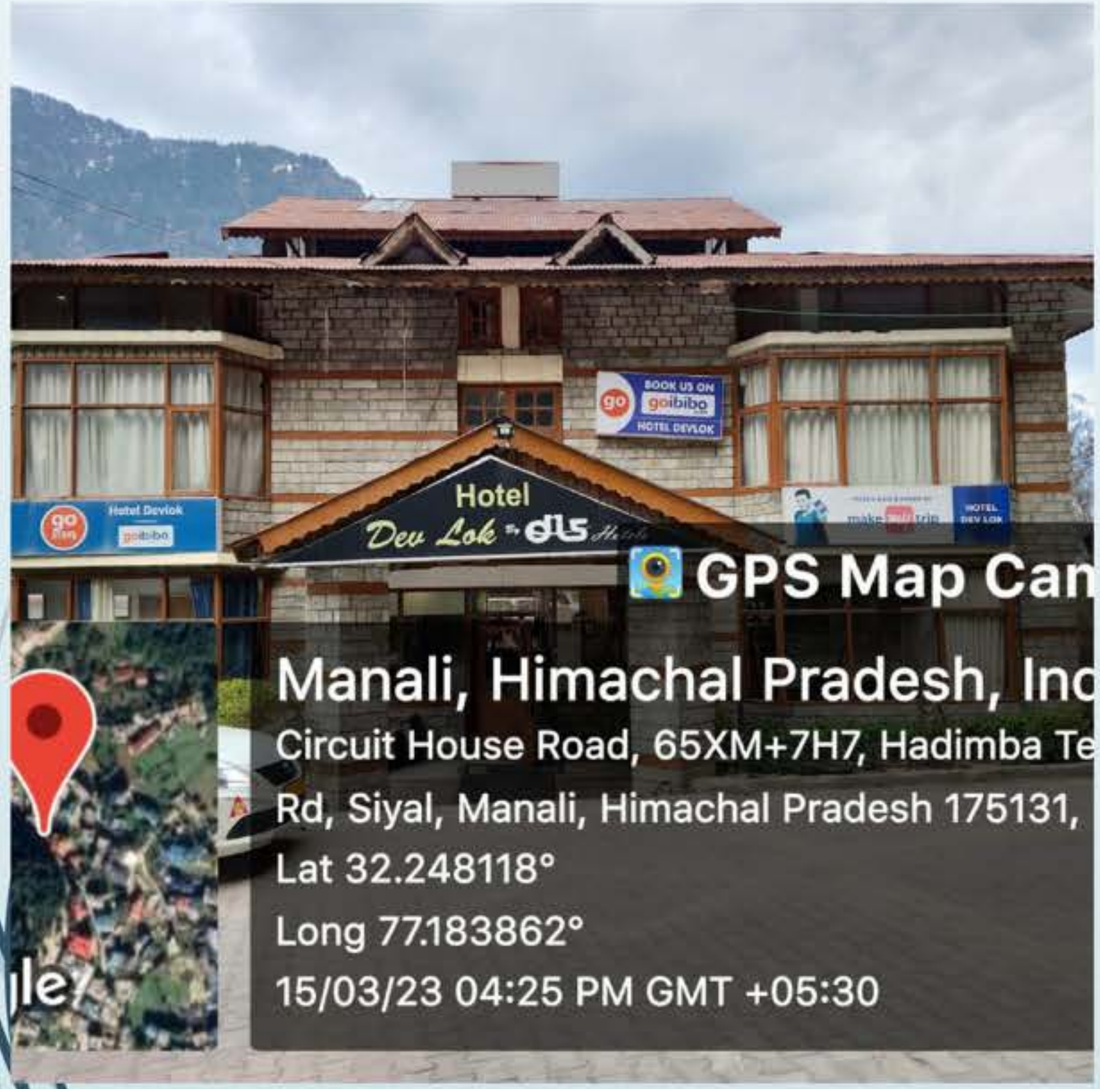
MY OBSERVATIONS

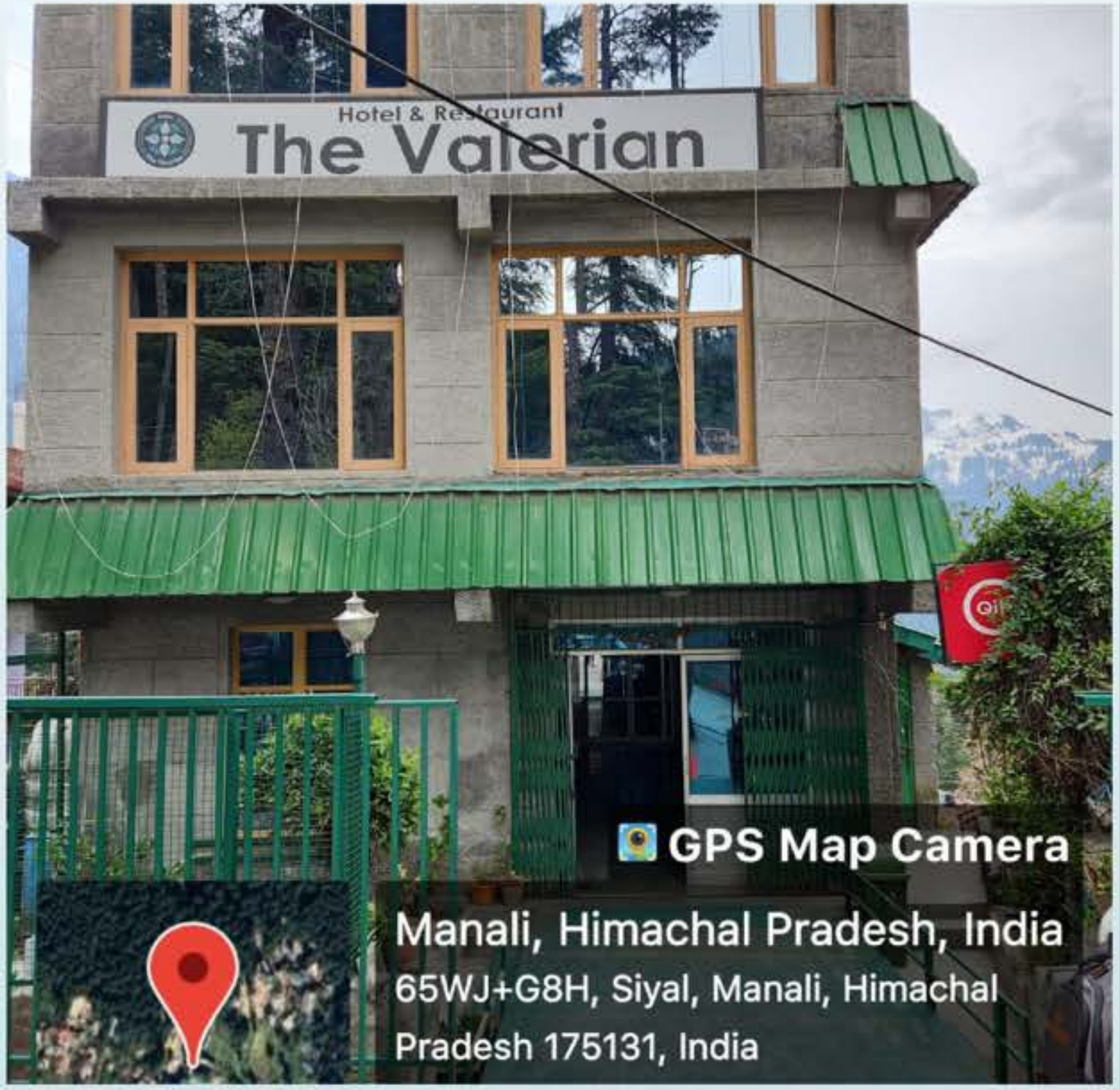
OVERALL THE MUNICIPAL WORKERS WORKED VERY EFFECTIVELY AND EFFICIENTLY , DAILY WASTE COLLECTION SERVICES WERE PROVIDED BY THEM ONLY AT PEAK SEASON SOME MISMANAGEMENT USED TO HAPPEN. THEY ALSO FOLLOWED THE SANITATION MEASURES VERY EFFICIENTLY TO PROTECT THEMSELVES FROM HEALTH PROBLEMS LIKE SKIN INFECTIONS,RESPIRATORY PROBLEMS ETC.OVERALL THE FEEDBACK AGAINST THEM WAS A POSITIVE ONE FROM THE HOTELS AND RESIDENTS LIVING THERE.

SOLID WASTE MANAGEMENT IN HOTELS AND RESTAURANTS

- MANALI, KASOL, AND MANIKARAN

HOTELS AND RSETAURANTS





SOLID WASTE GENERATION

The study conducted among **17 hotels and restaurants** in MANALI, SOLANG, AND KASOL shows that they produce on and **average 6 kg of solid waste per day ranging between 2 kg to 15 kg per day.**

Factors affecting variations in waste volume and composition include hotel size, pricing range, restaurant type etc.

Table no. 1

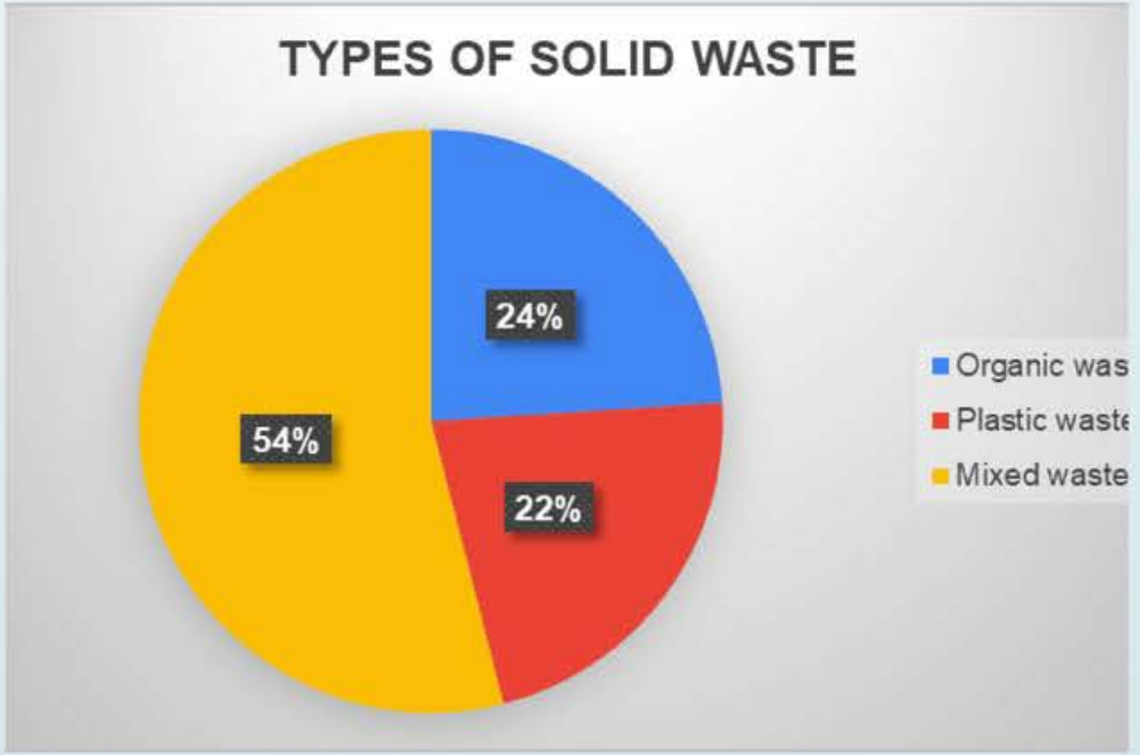
NO. OF RESPONDENT	WEIGHT OF SOLID WASTE(KG)
5	2-4
8	5-7
3	8-10
2	MORE THAN 10

TYPES OF SOLID WASTE GERERATED IN THE HOTELS AND RESTAURANTS

- **According to the responses on the types of waste they generate,the result were:-**

1. 24 % organic
2. 22 % plastic waste
3. 54 % mixed waste

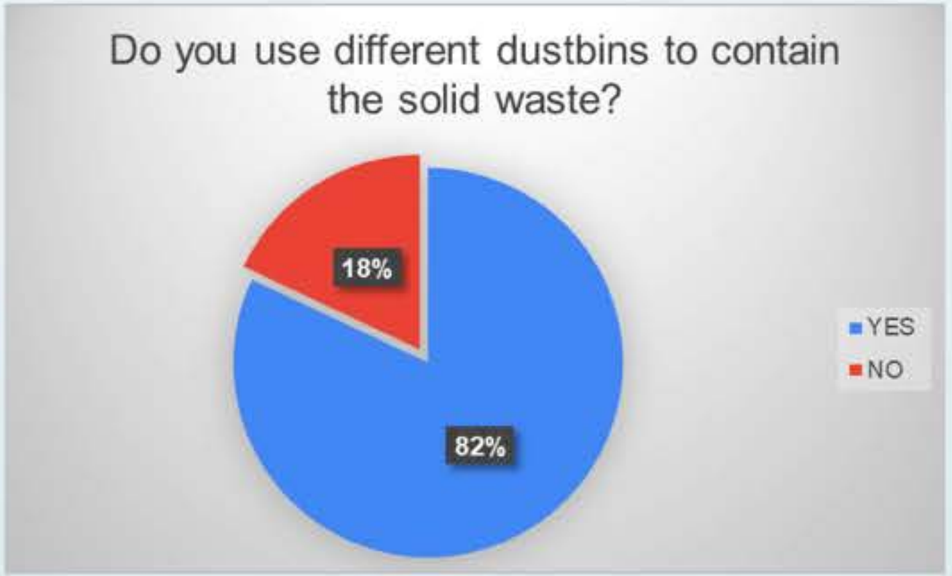
Maximum responses of mixed wastes because most of the establishmets gererate both biodegradable and non biodegradable wastes

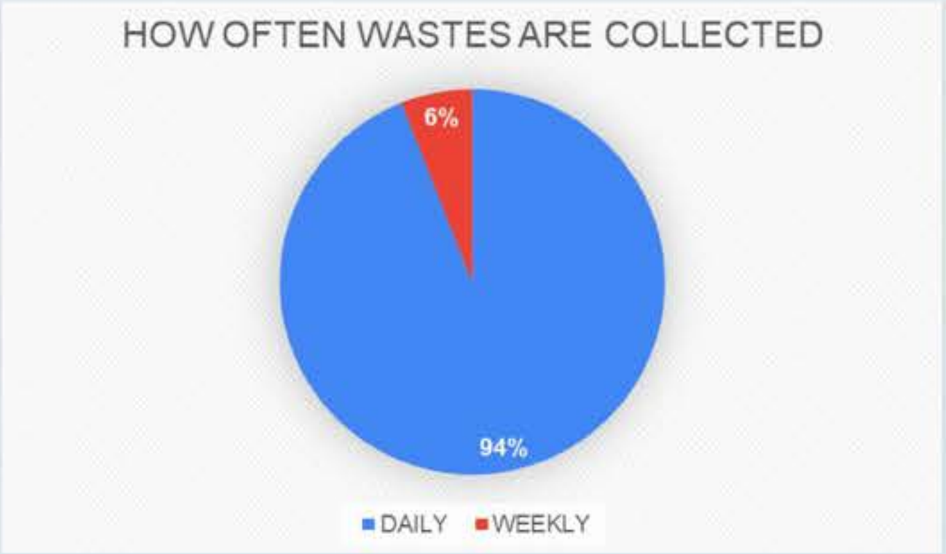


SEGREGATION OF SOLID WASTES

- **82 % - use dustbins**
- Segregation of waste- generally biodegradable(green) and non biodegradable(blue).
- **18 % - not use dustbinS**
- Reason – not available

- **WASTE COLLECTION**
- DAILY – 94 %
- WEEKLY – 6 %



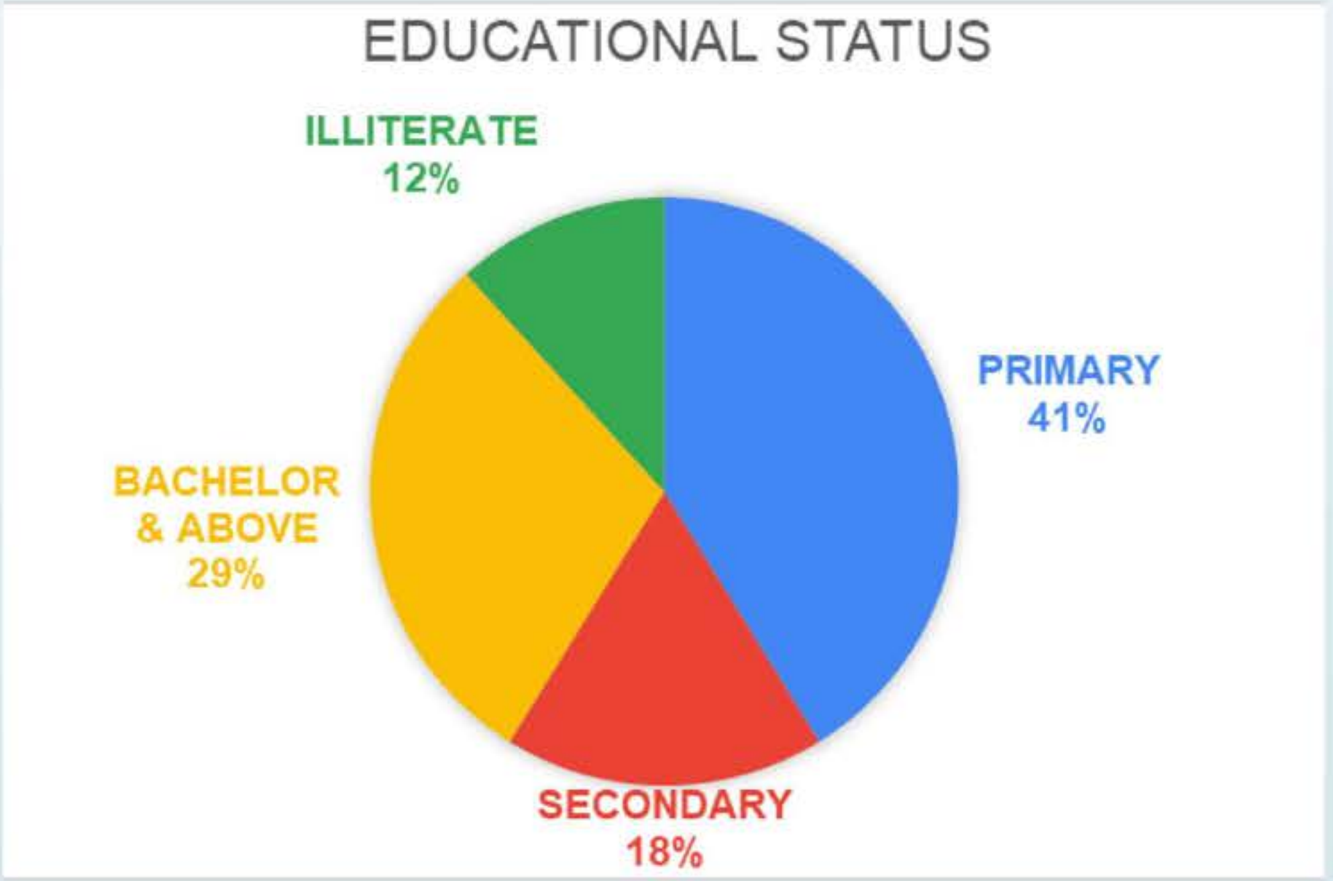


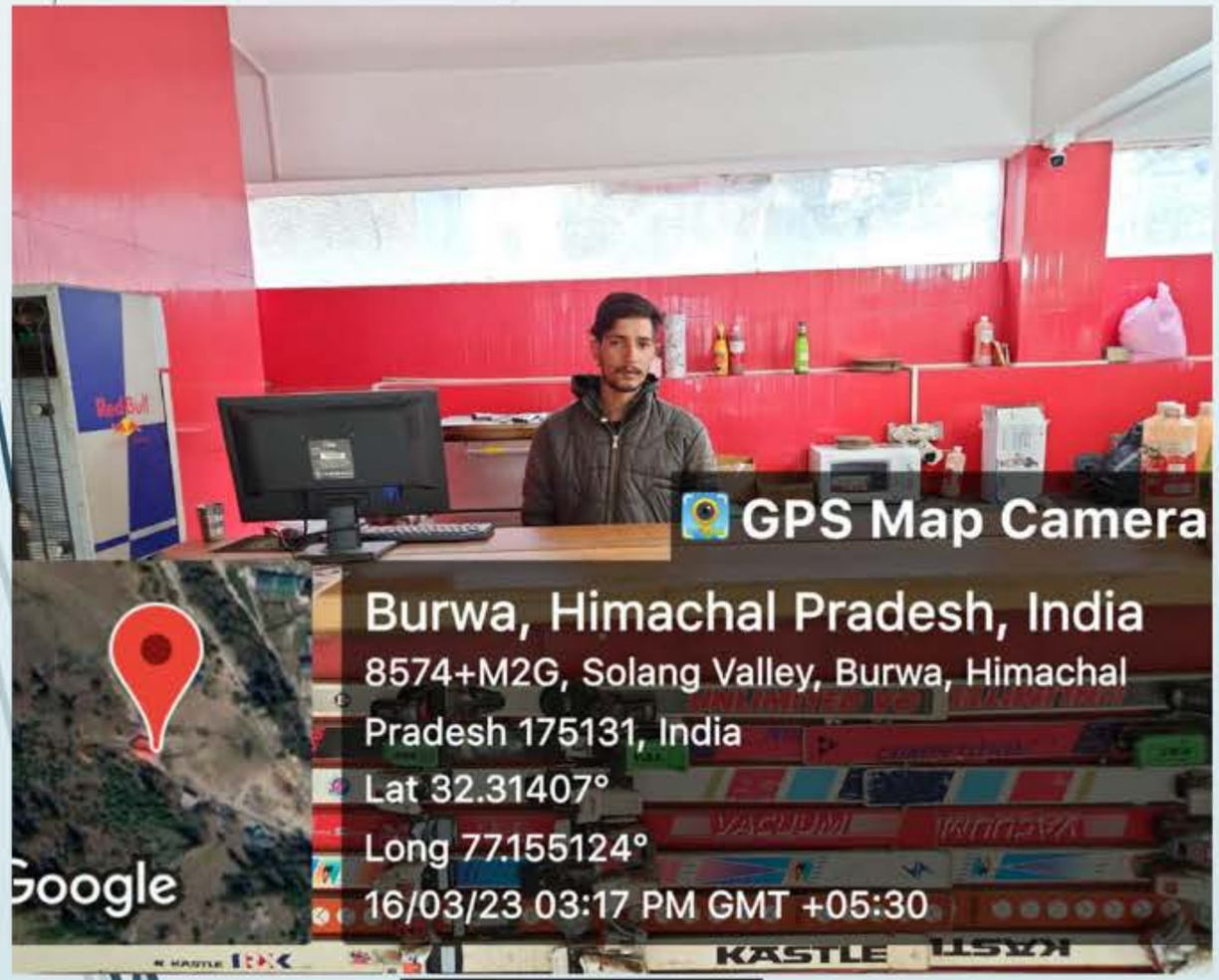
EDUCATIONAL STATUS

Talking about the educational qualification of the hotels and restaurants owners, we found that the following result:-

Trend:-

Large hotels and restaurants – mostly graduate.
Small hotel owners – primary to secondary
Shift due to covid -19.





GRADUATE

SECONDARY EDUCATION

ENGAGEMENT

On the question, From how long have you been engaged in this business? the responses were:-

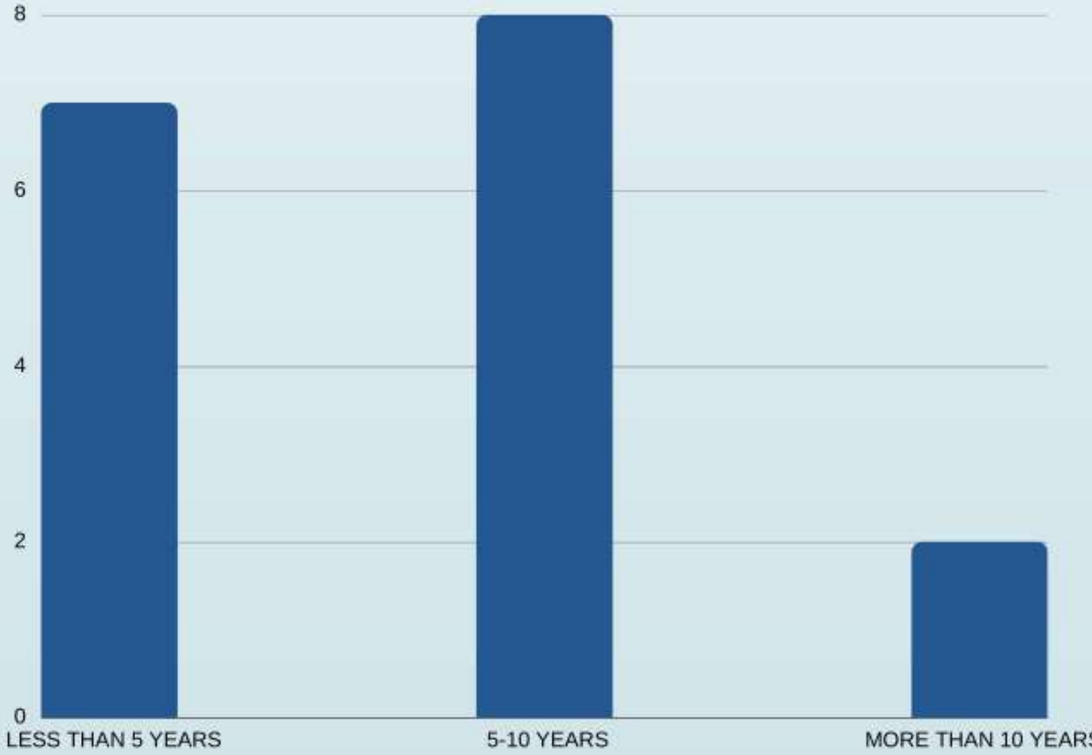
- Following the responses , we analysed that 7 out of 17 people started their businesses within 5 years . And most of them were small to medium scale food outlets.

1. Covid 19
2. Lack of job opportunity

- Rest of them were medium to large scale hotels and restaurants which were there for more than 5 years.

Table no. 2

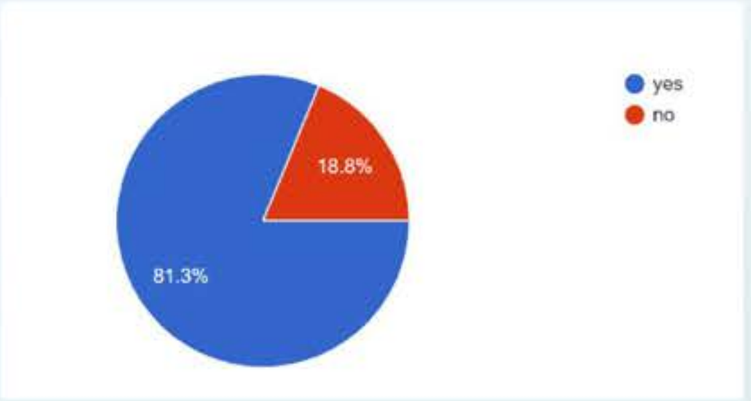
NO OF RESPONDENT	YEAR
7	LESS THAN 5 YEARS
8	5 – 10 YEARS
2	MORE THAN 10 YEARS



Do you ensure minimal waste generation in your facility? There responses were:-

What practices do you adopt to minimise your waste collection ?

- Buffet dinner :A buffet is a self-service style where the guests serve themselves.
- Not using single use plastic.
- Providing reusable items such as cloth napkins, refillable water bottles, shampoo etc.



BUFFET DINNER AREA
-HOTEL YAK MANALI

RESEARCH METHADOLOGY

- Research Methodology Research Approach: Quantitative
- Research Design: Descriptive
- Research Instrument: Survey, Interview (nondirective) and observation (non- participant)
- Scaling: Nominal & Ordinal Sampling: Non-probability sampling (convenience sampling)
- Data Collection: Primary and Secondary Research Tool: Excel (pie charts, bar-graphs)

VILLAGE VISE SUMMARIZATION

- VILLAGE VISE SUMMARIZATION OF WASTE MANAGEMENT OF THE SURVEY AREA IS ACHIEVED USING COMPOSITE INDICES.
- THIS COMPOSITE INDEX WAS MADE USING VARIOUS QUANTITATIVE RESPONSES WHICH ICLUDES YES OR NO AND TIME FREQUENCIES.
- ALL THE 3 TYPES OF REPONDENTS ,THAT IS , RESTAURENTS RELATED AND RESIDENTS ARE USED.
- A COMPOSITE TABLE IS MADE BY CODING VALUES TO YES OR NO QUESTIONS AND TIME BASED QUESTIONS. (IN THE COMING TABLES

YES IS CODED AS 1 , NO AS 0 , DAILY AS 2 AND WEEKLY AS 1)

COMPOSITE TABLE – GENERAL AWARENESSOF RESIDENTS

VILLAGE	3 SCORES	2 SCORES	1 SCORE	0 SCORE	TOTAL	RATIO TO TOTAL	RATIO TO EACH TOTA
MANALI	9	4	0	0	35	0.29	2.69
KASOL	9	4	1	3	36	0.3	2.11
VASHISHT	5	3	5	0	26	0.21	2
SOLANG	4	0	2	1	14	0.11	2
BURWA	0	0	1	0	1	0.008	1
KOTHI	1	0	1	0	4	0.03	2
PALCHAN	0	1	1	0	3	0.02	1.5

HIGHEST IS MANALI AND THE LOWEST IS BURWA.

COMPOSITE INDEX – AWARENESS ABOUT GOVERNMENT INITIATIVES AND SYSTEM

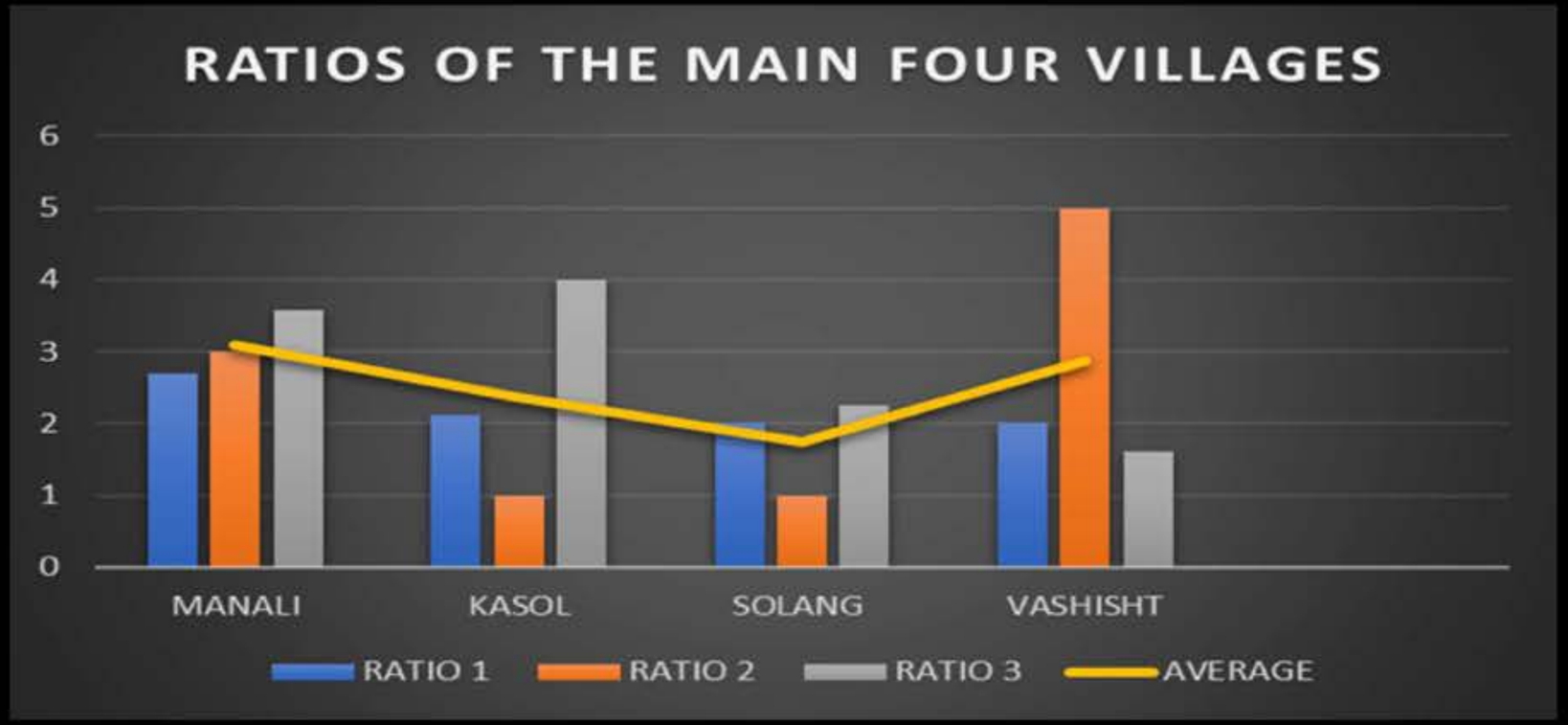
VILLAGE	4 SCORES	3 SCORES	2 SCORES	1 AND 0 SCORES	TOTAL(4 SCORE IS 4, 3 IS 3, 2 IS 2 AND 1,0 IS 1	RATIO TO TOTAL	RATIO TO TOTAL RESP	ATTEND
VASHISHT	1	3	4	5	26	0.22	2	5
SOLANG	1	1	3	2	15	0.13	2.14	1
PALCHAN	0	1	1	0	5	0.04	2.5	1
MANALI	0	0	0	13	13	0.11	1	3
BURMA	1	0	0	0	4	0.03	4	1
KOTHI	2	0	0	0	8	0.06	4	2
KASOL	1	8	8	0	44	0.38	2.58	1
				TOTAL	115			-0.42441071

COMPOSITE INDEX – EFFECTIVE WASTE MANAGEMENT , GENERAL AWARENESS AND GOVERNMENT INITIATIVES OF RESTAURENTS AND HOTELS

VILLAGE	6 SCORE (	5SCORE	4 SCORE	3 SCORE	TOTAL POI	RATIO TO EACH TOTAL
MANALI	4	3	0	0	25	3.57
SOLANG V	1	0	2	1	9	2.25
VASHISHT	0	0	2	1	5	1.6
KASOL	3	0	0	0	12	4

THE MAIN FOUR VILLAGES

THE MAIN FOUR VILLAGES	RATIO 1	RATIO 2	RATIO 3	AVERAGE
MANALI	2.69	3	3.57	3.086666667
KASOL	2.11	1	4	2.37
SOLANG	2	1	2.25	1.75
VASHISHT	2	5	1.6	2.866666667



INFERENCE

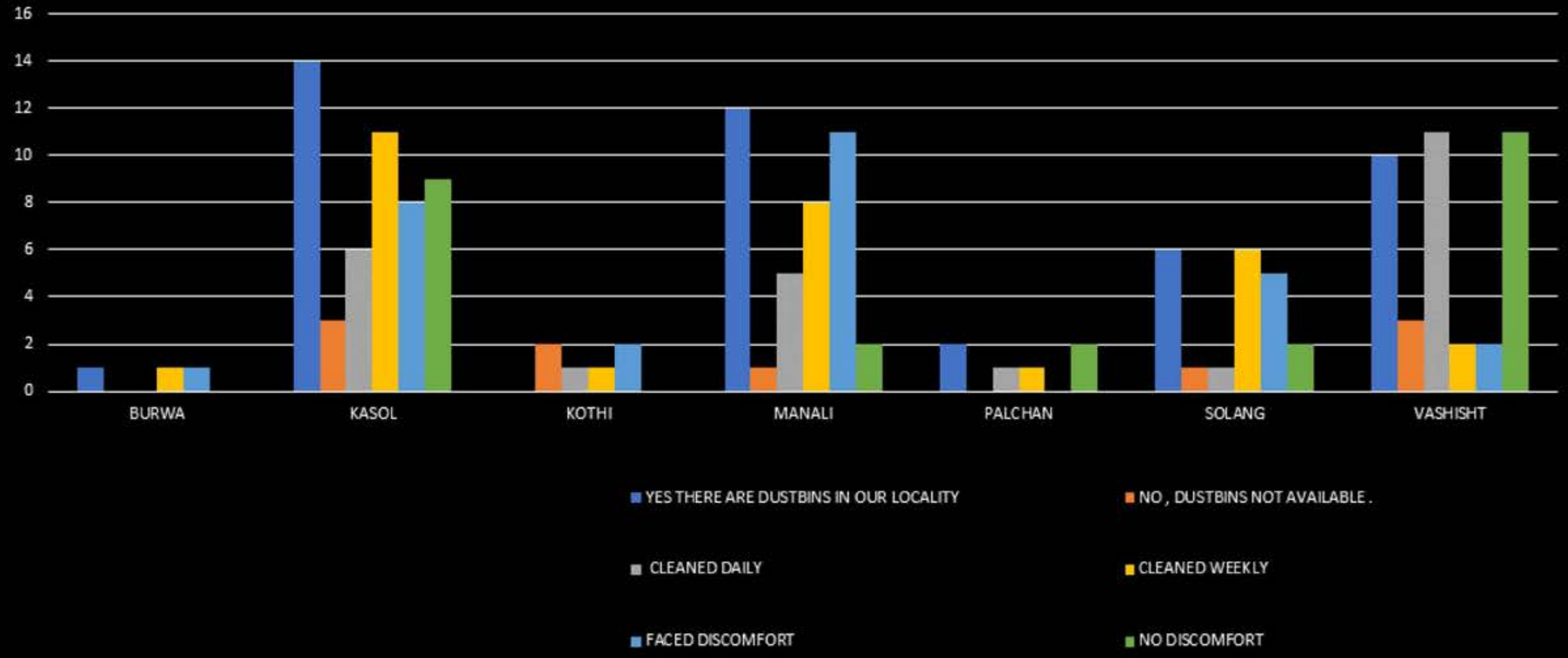
- FROM THE GRAPH WE CAN UNDERSTAND THAT THE LEVEL OF AWARENESS AND ACCOUNTABILITY OF THE ESTABLISHED WASTE MANAGEMENT SYSTEM IS THE HIGHEST IN MANALI AND THE LOWEST IN SOLANG.

CROSS TABLE ANALYSIS

- CROSS TABLES WERE MADE TO ANALYSE THE FUNCTIONING OF THE MUNICIPALITY .
- TWO DIFFERENT TABLES WERE CREATED BASED ON THE RESPONSES FROM THE RESIDENTS AND THE RESTRO – HOTELS.

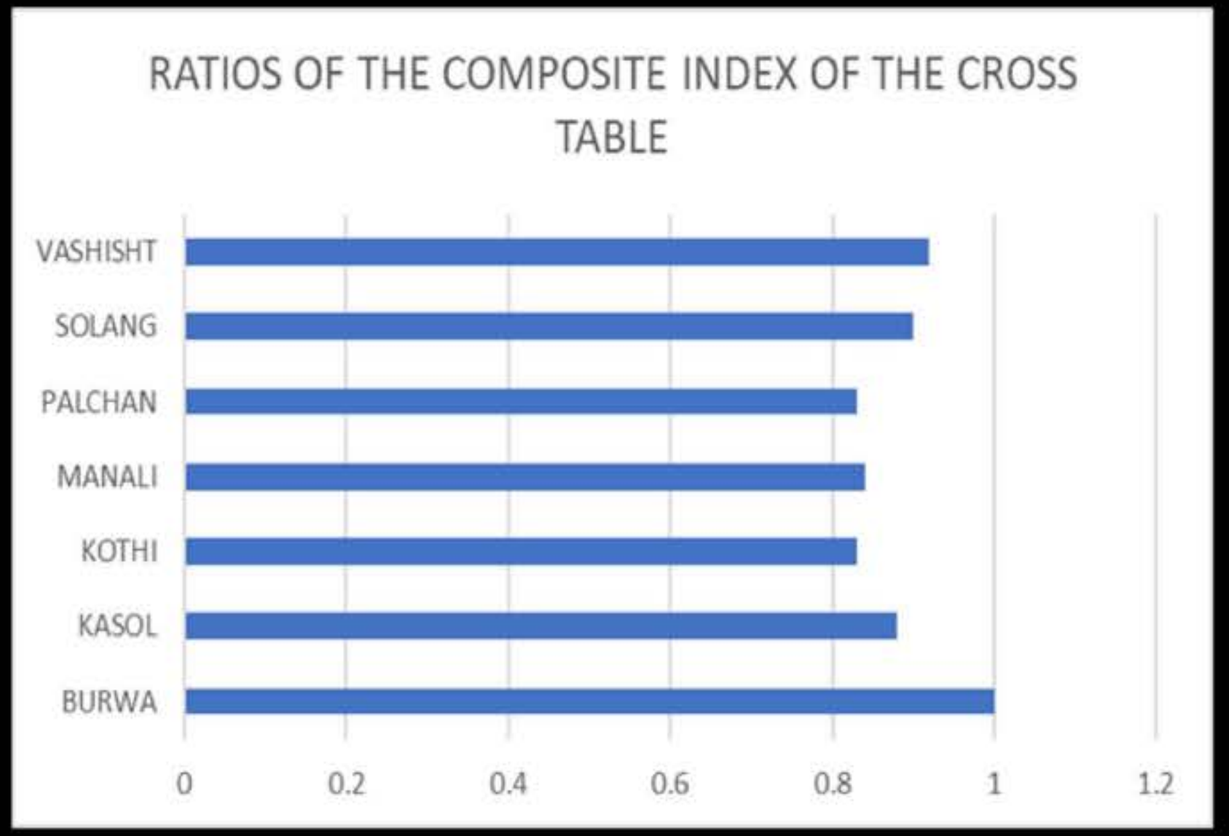
CROSS TABLE ANALYSIS – RESIDENTS ' RESPONSES

VILLAGE	YES THERE ARE DUSTBINS IN OUR LOCALITY	NO , DUSTBINS NOT AVAILABLE .	CLEANED DAILY	CLEANED WEEKLY	FACED DISCOMFORT	NO DISCOMFORT	Column1
BURWA	1	0	0	1	1	0	
KASOL	14	3	6	11	8	9	
KOTHI	0	2	1	1	2	0	
MANALI	12	1	5	8	11	2	
PALCHAN	2	0	1	1	0	2	
SOLANG	6	1	1	6	5	2	
VASHISHT	10	3	11	2	2	11	


16
14
12
10
8
6
4
2
0
BURWA
KASOL
KOTHI
MANALI
PALCHAN
SOLANG
VASHISHT
YES THERE ARE DUSTBINS IN OUR LOCALITY
NO , DUSTBINS NOT AVAILABLE .
CLEANED DAILY
CLEANED WEEKLY
FACED DISCOMFORT
NO DISCOMFORT

COMPARISON OF VILLAGES USING COMPOSITE INDEX

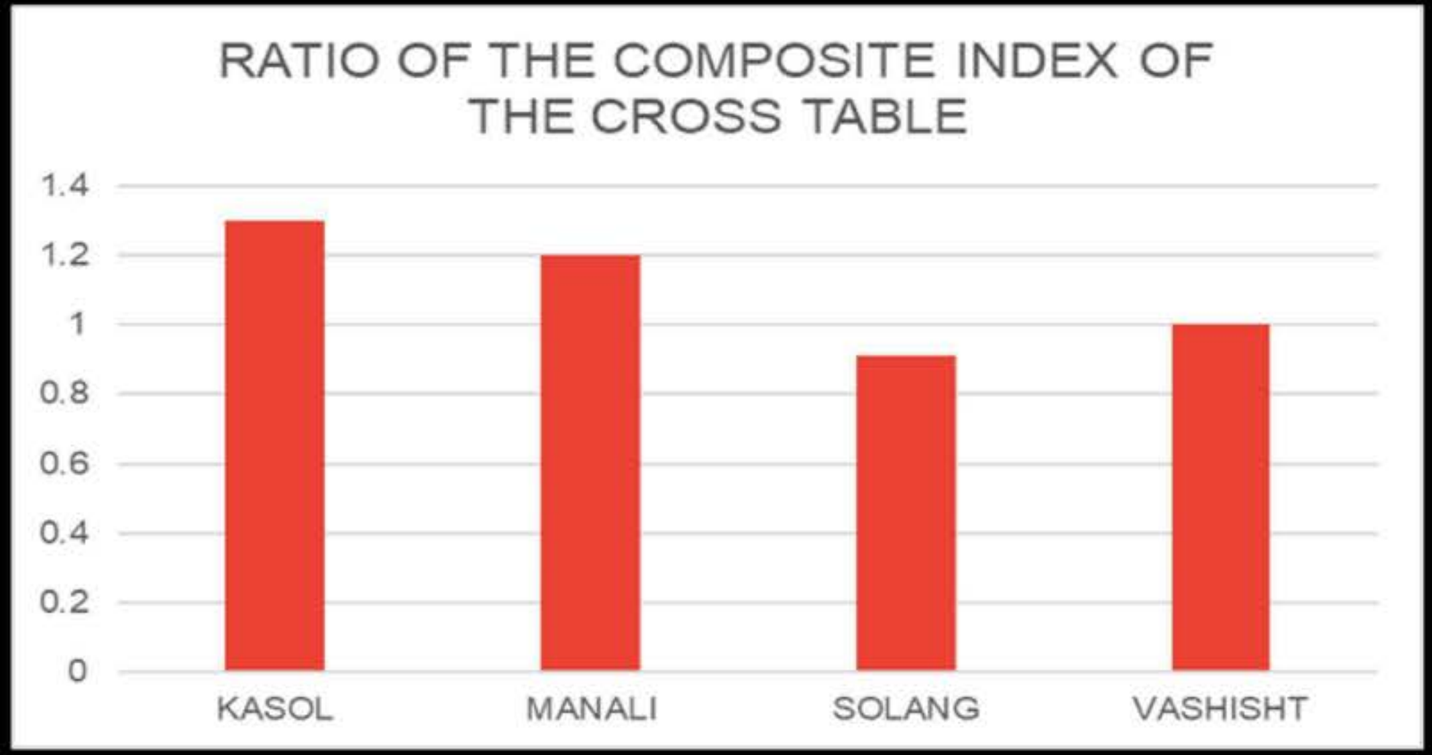
VILLAGE	RATIO
BURWA	1
KASOL	0.88
KOTHI	0.83
MANALI	0.84
PALCHAN	0.83
SOLANG	0.9
VASHISHT	0.92



CROSS TABLE ANALYSIS – HOTELS' RESPONSE

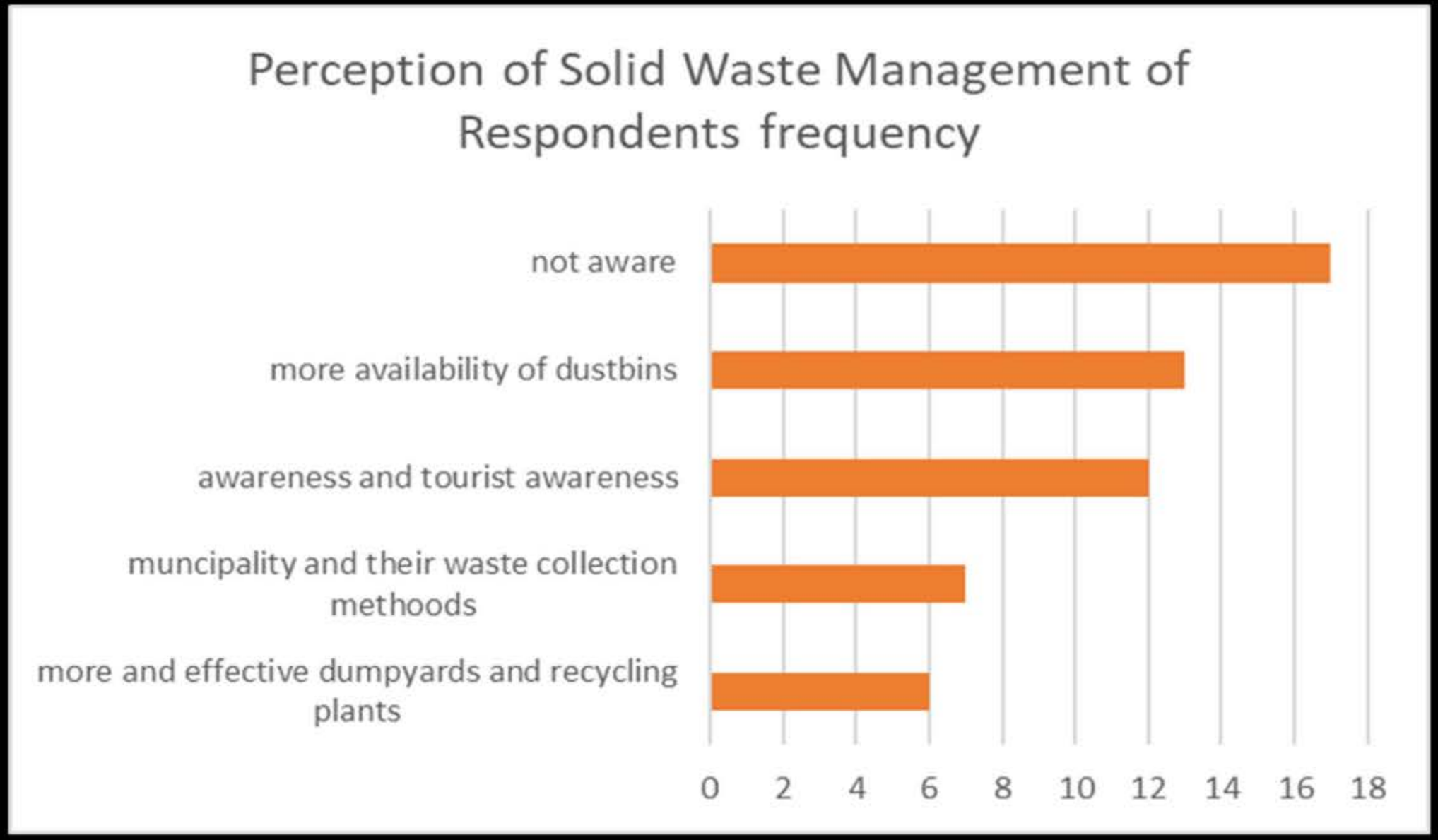
VILLAGE	DOES MUNICIPAL		DOES MUNICIPAL		FREQUENCY OF COLLECTION	
	YES	NO	YES	NO	DAILY	WEEKLY
KASOL	3	0	3	0	3	0
MANALI	6	1	6	0	6	0
SOLANG	1	3	4	0	3	1
VASHISHT	0	3	3	0	3	0

VILLAGE	SCORES	RATIO
KASOL	12	1.3
MANALI	24	1.2
SOLANG	11	0.91
VASHISHT	9	1



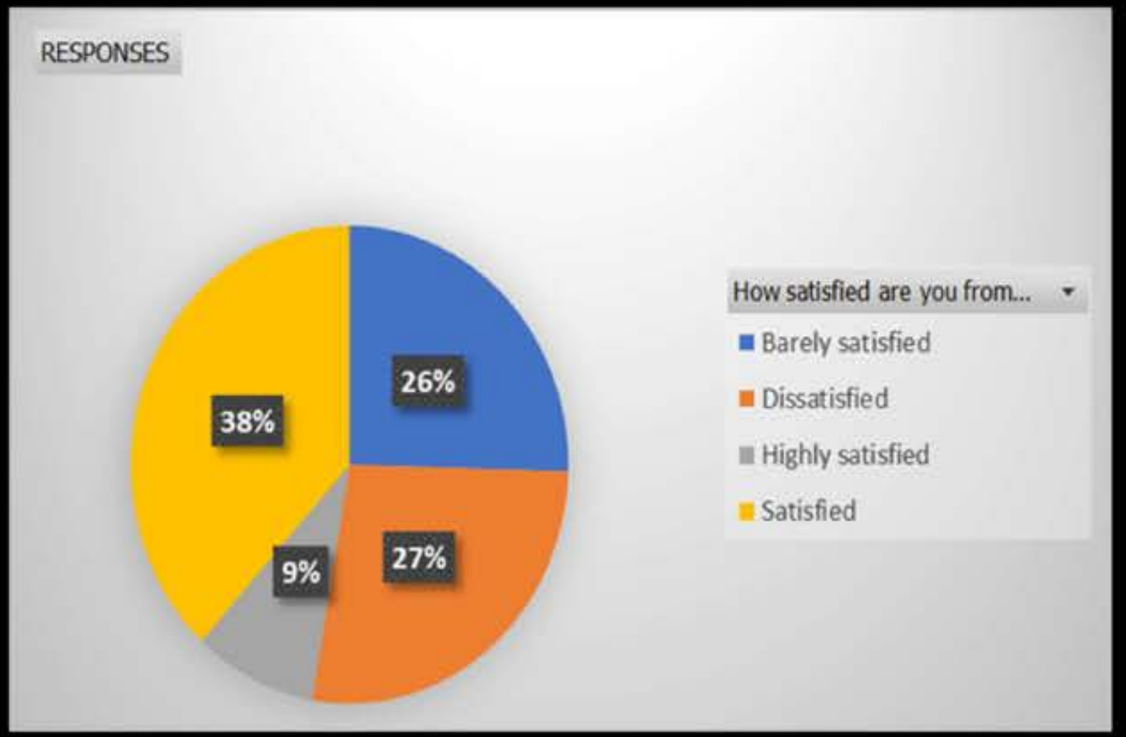
PEOPLES' PERCEPTION ABOUT THE EXISTING WASTE DISPOSAL

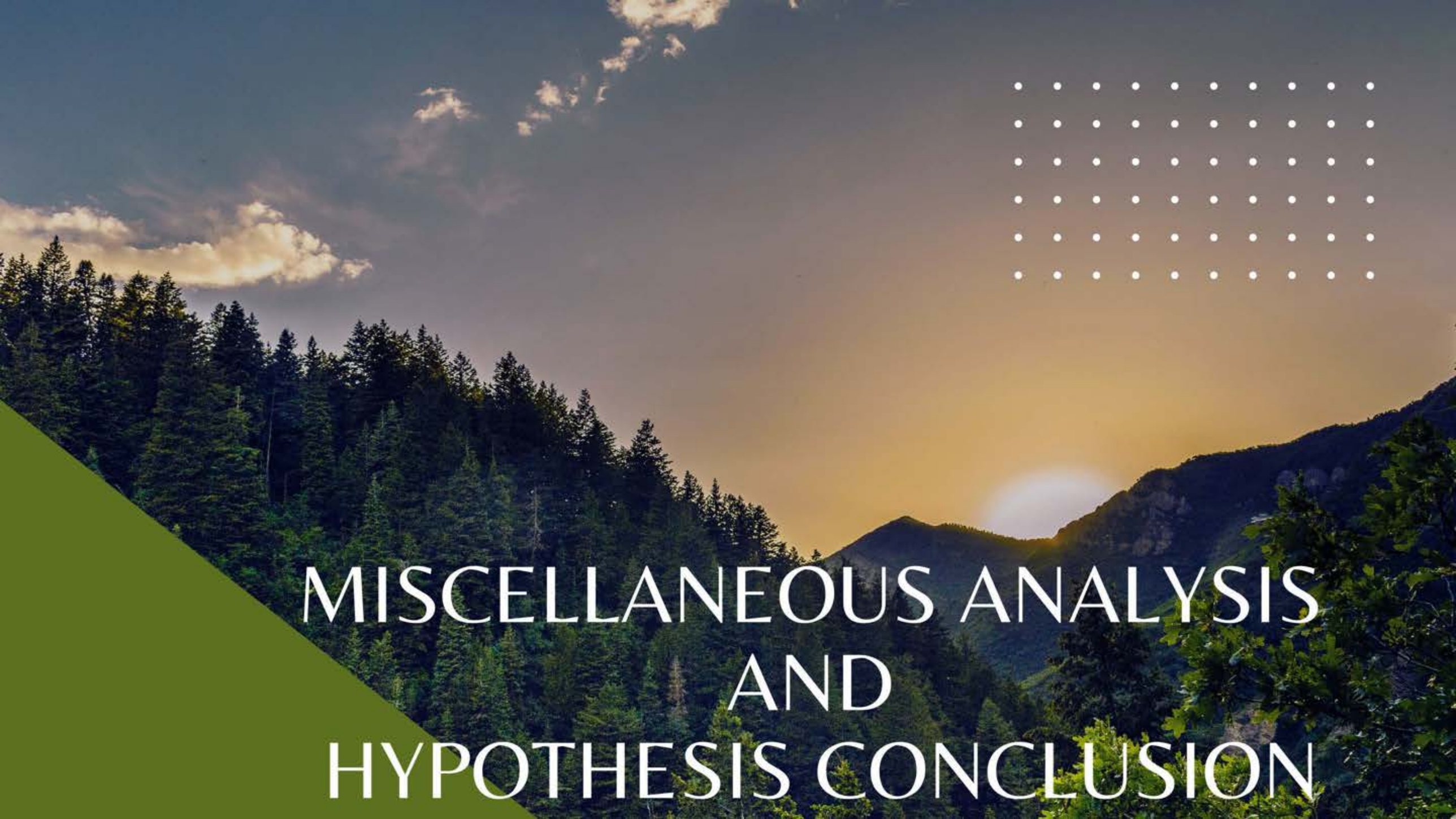
Perception of Solid Waste Management of Respondents	
Perceptions relating to ;	frequency
more and effective dumpyards and recycling plants	6
muncipality and their waste collection methoods	7
awareness and tourist awareness	12
more availability of dustbins	13
not aware	17


Perception of Solid Waste Management of Respondents frequency
not aware
more availability of dustbins
awareness and tourist awareness
muncipality and their waste collection methoods
more and effective dumpyards and recycling plants
0
2
4
6
8
10
12
14
16
18

LEVEL OF SATISFACTION OF PEOPLE ABOUT THE EXISTING SYSTEM AND CONTEMPORARY CHANGES

How satisfied are you from from the solid waste management changes?	RESPONSES
Barely satisfied	14
Dissatisfied	15
Highly satisfied	5
Satisfied	21





MISCELLANEOUS ANALYSIS AND HYPOTHESIS CONCLUSION

Through this topic we will get to know the minute and often ignored details regarding the solid waste management in the research areas. As our research area is dominated by the tourist sites and locations, the improper management of solid wastes not only leads to an issues to spread of diseases or choking up of streamlets, it also greatly impacts the aesthetics of the tourist spots leading to tarnished image of the natural landscapes.

Further, through the slides will cover the testing and analysis of all the hypotheses and attempt to determine whether those hypotheses were proven or not.

DAY 1

HIDIMBA TEMPLE AND MANALI

- While we were en route to Hidimba temple, there was accumulation of solid waste on the slopes of the route towards the temple (near the footsteps).
- The vicinity of the Hidimba temple was very clean and the solid waste was managed properly as there were both types of dustbins, i.e Blue and Green.
- Sustainable dustbins made up of woven tree branches were placed near the stalls in the compound of the temple.

DAY 2

ATAL TUNNEL AND SOLANG VALLEY

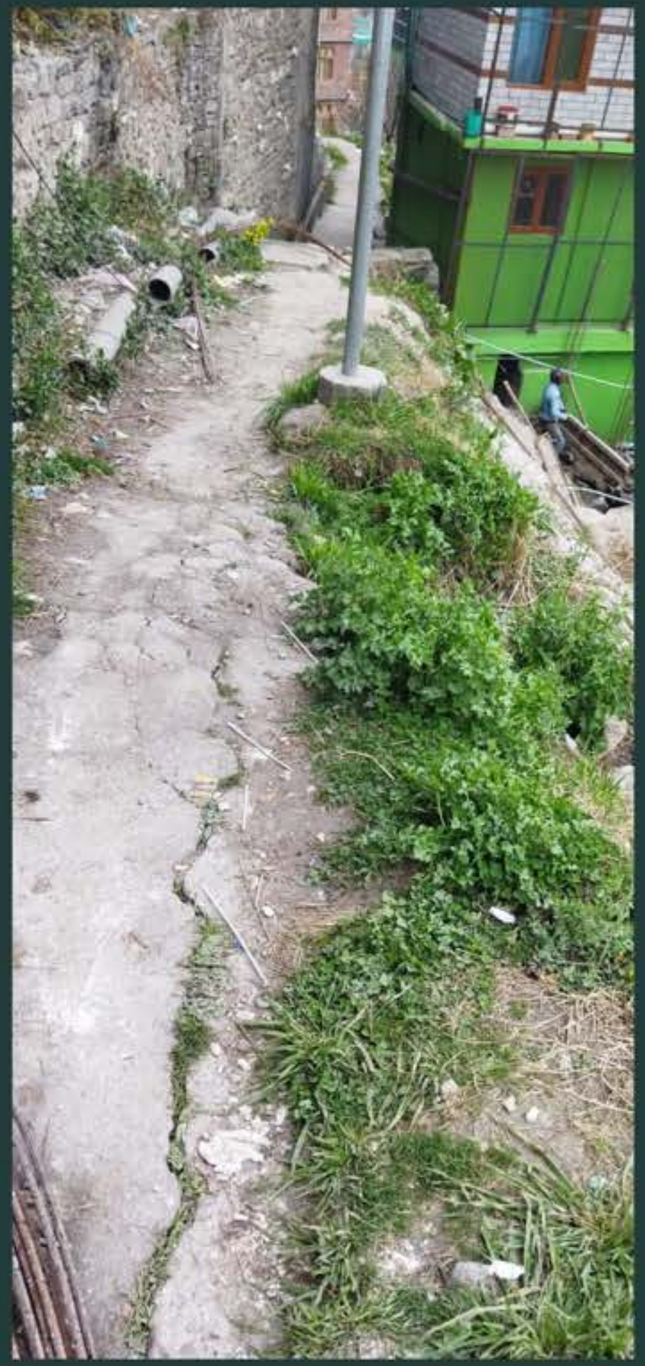
- There was a high presence of tourists in the area, thus the major negative impact to to the glowing beauty of the landscape was caused due to the plastic wastes by the tourists .
- Another major issue of solid waste is caused due to the adventure events conducted in the solang valley. The technical textiles used in the manufacture of gliders, suits, camps often get undisposed properly.


QUECHUA

DAY 3

Beas river and Vashishth Kund

- Near the slopes of Beas river, solid waste was spread all around. This was the reason of occassional appearance of plastic bottles and wrappers in the course of river.
- Along the trail to Vashishth Kund, through the shortcut path, few streamlets were visibly clogged with polythene and plastic wastes. This waste was being carried down till the confluence of the streamlets and the main river.



DAY 4

KASOL AND MANIKARAN

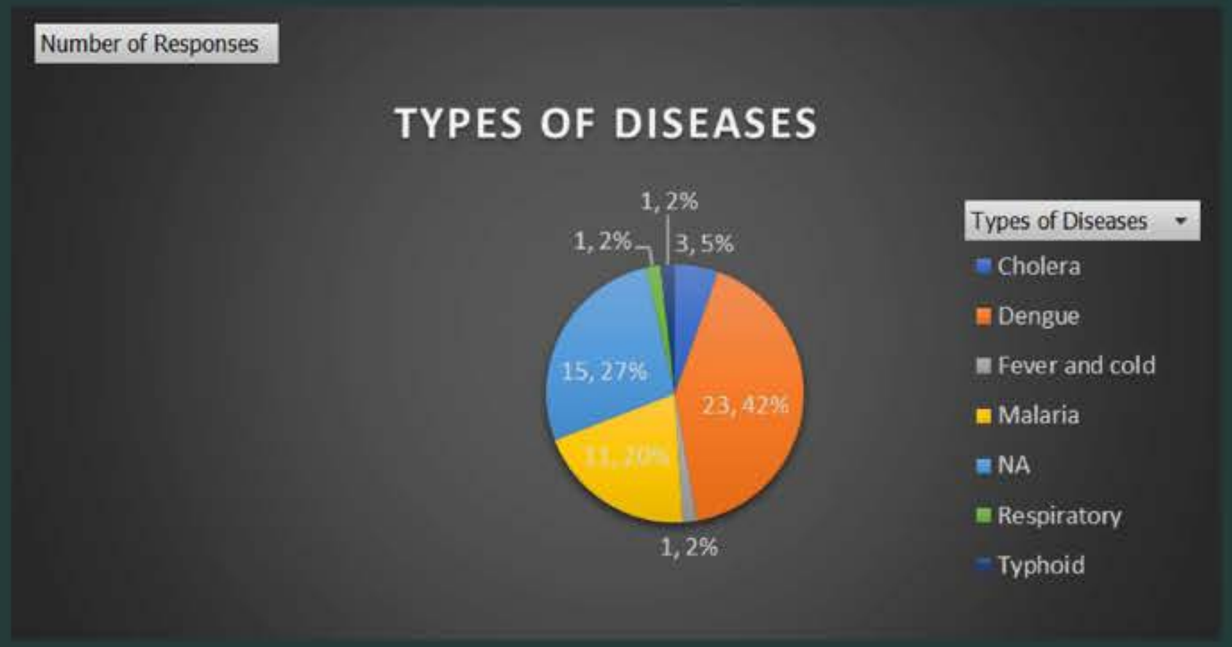
- Kasol is dominated by tourists thus the roads were scattered with plastic bottles and wrappers, and this was the reason that the locals were wary of tourists coming to Kasol and littering the landscape. One local explained in detail the various hazards that Kasol is facing ranging from backward push in glacier to the disappearance of birds towards the Grahan village.

HYPOTHESES CONCLUSION

STATEMENT 1

Improper management of solid wastes lead to spread of viral and bacterial diseases

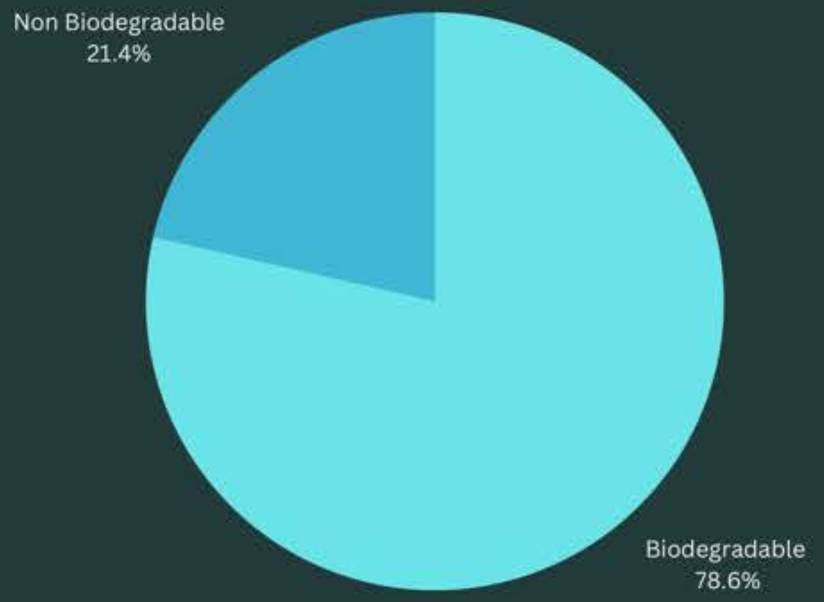
Thus, we can conclude with our observations and analysis that Cholera and Dengue are most prevalent diseases caused by the mismanagement of solid wastes.Cholera is a bacterial disease causing severe diarrhoea and dehydration, usually spread in water. Dengue is a mosquito-borne viral disease occurring in tropical and subtropical areas. These diseases are fatal for human health.



STATEMENT 2

There is a dominance of Ready Biodegradable Waste (RBD) amongst the households of the selected area.

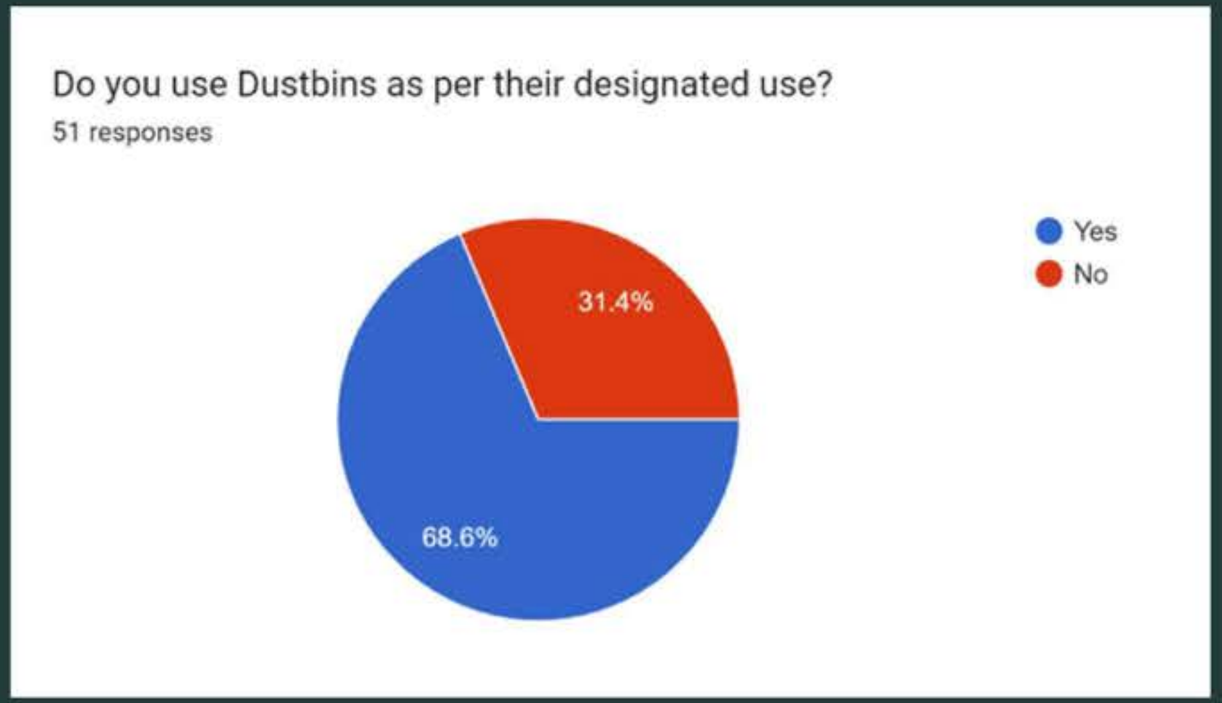
Thus, according to the various analysis done previously , we can conclude that our hypothesis was proven, as out of the 14 responses collected, 11 respondents described that major waste generated comprises of biodegradable wastes.
Also, the highest amount of waste generation was contributed by households, comprising of 42.9% of the total waste generated.

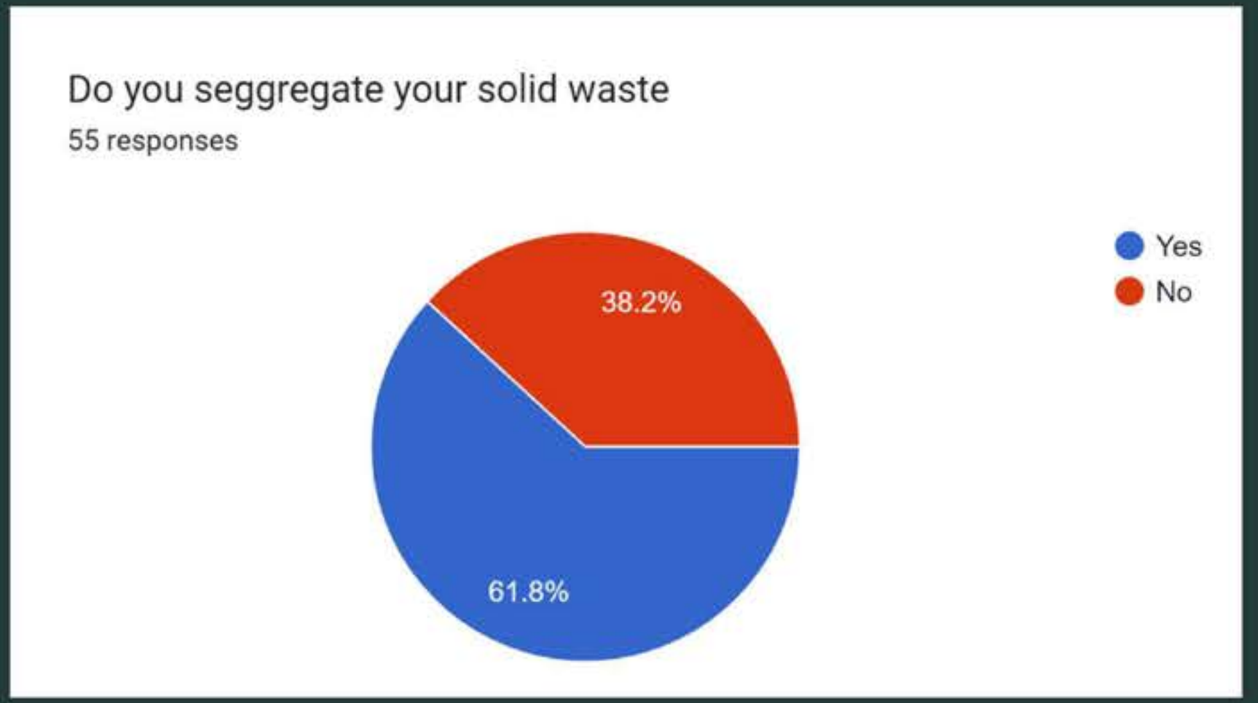


TYPE OF WASTE GENERATED

STATEMENT 3

Target audience of Manali, Kasol and Solang valley are aware of the different methods of waste disposal; includes the distinction between blue and green dustbins



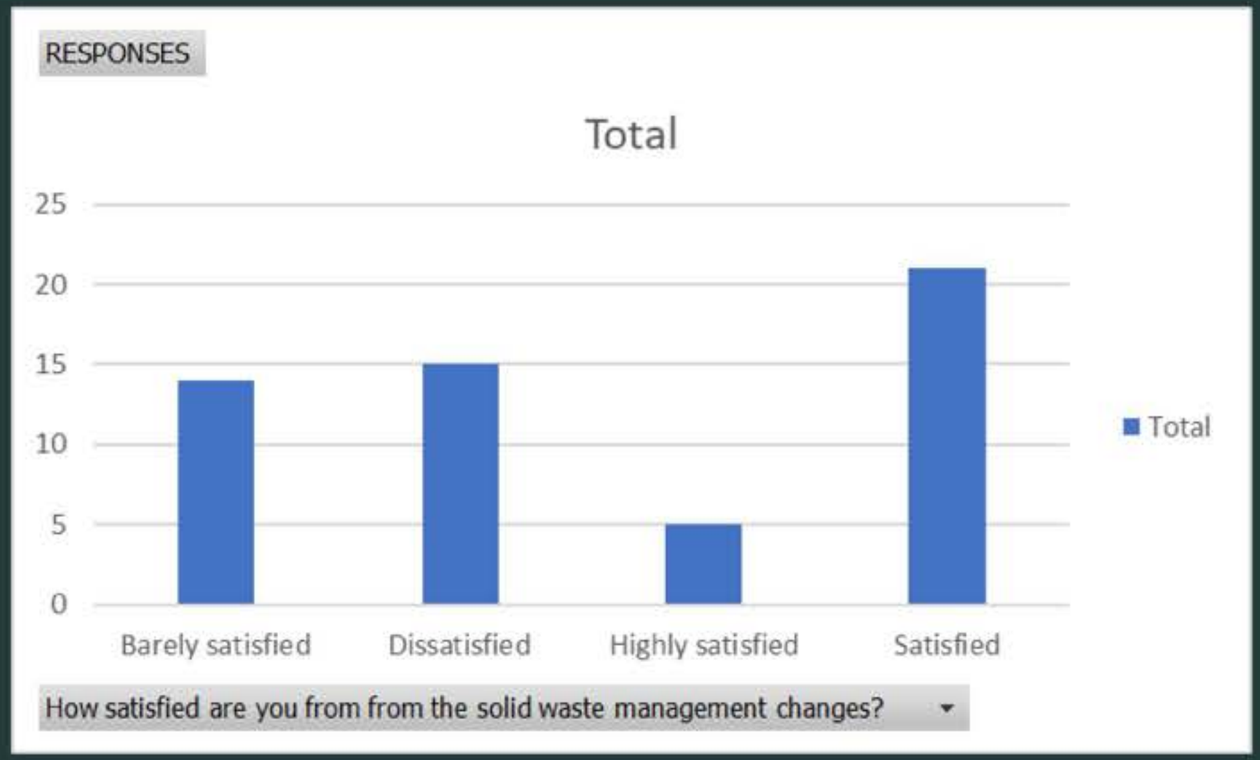


Thus, through the above analysis we can conclude that our hypothesis is positively proven as out of 51 responses, 68.6% i.e 35 persons were aware of different types of dustbins and used it as per their designation. Also 34 persons out of 55 were able to segregate their solid waste.

STATEMENT 4

The people of the targeted areas are satisfied with the existing solid waste management practices.

This hypothesis was ambiguous as the results obtained after survey was in equivocal. Out of 55 respondents, 29 respondents were barely satisfied or dissatisfied whereas 26 respondents out of 55 were satisfied or highly satisfied. Thus, the results were mixed. So, we cannot, with conviction accept or reject the hypothesis.



SATISFACTION RESPONSE REGARDING SWM PRACTICES

CONCLUSION & EXPERIENCE

VIDUSHI SINGH
ROLL NO.
2118148

FIELD TRIP

Van Vihar, Fri 17th March'23

Kasol, Sat 18th March'23

A Learning Experience

Kasol, Sat 18th March'23

Hadimba temple, Wed 15th March'23

THE THREE C's

- COMMUNICATION (among the students, teachers and information)
  - EFFICIENCY AMONG MEMBERS
  - DAILY REVIEWS
- COOPERATION (among members of different groups)
- COMPASSION (curiosity for science, practical knowledge and geography)

COMMUNICATION

EFFICIENCY AMONG STUDENTS

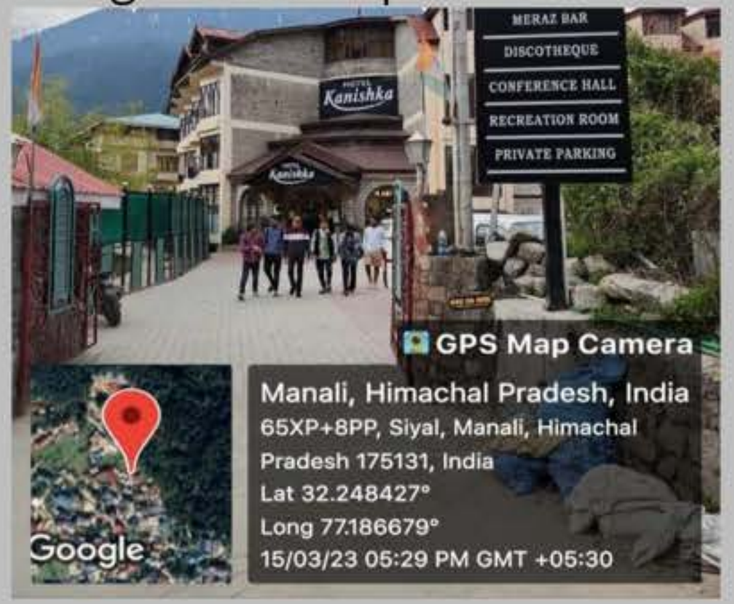
- The planning of the whole trip was done by the students which facilitated better communication and exchange of information.
- Helped in the formation of the questionnaires
  - accommodating ideas
  - getting everyone's point of view.
  - making revisions
- Approaching the respondents
  - dividing the respondents.
  - how to go up to them and start asking or begin the introduction

DAILY REVIEWS

- All the aspects of a trip's success are directly or indirectly dependent on the teacher (Millan, 1995)
- The daily reviews helped to improve and gain important insights about our surroundings and the wholesome understanding of the field trip.
- Going over whatever was done during the day with
  the teachers helped us express ourselves better.
- The teachers played an important role since their experience was very helpful in understanding the concepts behind field trips.

COOPERATION

- Understanding the topics of the other groups and conducting surveys on their topics
- Making the respondents comfortable while filling the questionnaires and cooperating with them. This included asking them the questions in a simpler manner rather than handing out the questionnaires. This was effective in case of less educated or illiterate people.
- This field trip facilitated the betterment of the capacities of students to cooperate with people and respond well to the ones who were unwilling to answer questions



COMPASSION

- The outcome of an experience depends on a person's interests, motivation, life circumstances at that
  time, needs, and prior experiences and knowledge (Rennie, 2007).

- Apart from conducting a study and surveying, this field trip was also about the student's understanding of field work and instilling in them, the ability to gather first hand authentic data.

- Field trips offer an opportunity to motivate and connect students to appreciate and understand classroom concepts, which increase a student's knowledge foundation, promoting further learning and higher level thinking strategies. With understanding comes confidence and intrinsic motivation.

- On this trip, apart from conducting the surveys and getting respondents to get the questionnaires filled, as geographers, we all had some very raw observations about the places we visited.

- All these observations increase our curiosity and ability to interpret our surrounding, in other words, making us more compassionate about the subject of Geography and helping us become efficient geographers.

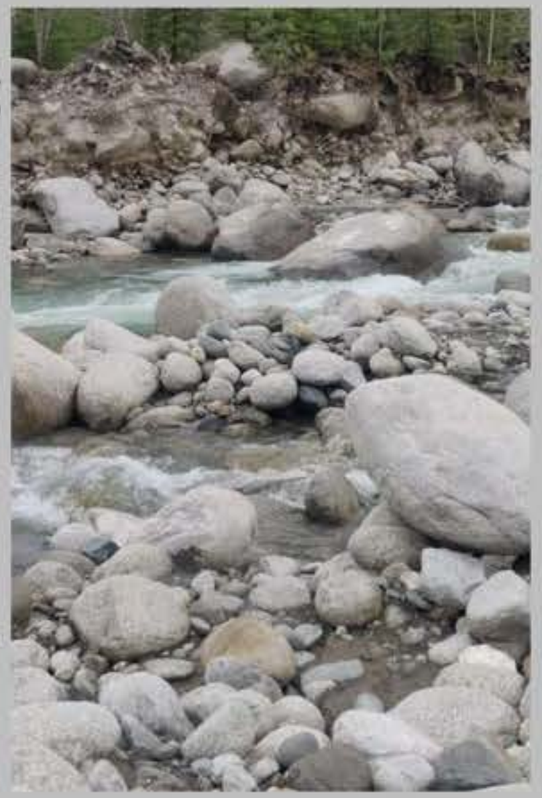
OBSERVATIONS

SOLID WASTE MANAGEMENT

- Types of dustbins
- Types of dumping places
- Cleanliness of the rivers
- Use and disposal of plastic on the trip

OTHER OBSERVATIONS

- The size of the rocks or boulders that rivers bring with them shows that the origin of the river is close proximity.
- The weathered structures of the rock
- The step farming views on the journey
- The evidences of landslides on the slopes
- The cracking and subsidence due to construction activities while trekking
- The natural vegetation
- The people involved in the different occupations

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Sharma Food Corner
GPS Map Camera
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65XP+Q79, opp. Circuit House Road, Siyal,
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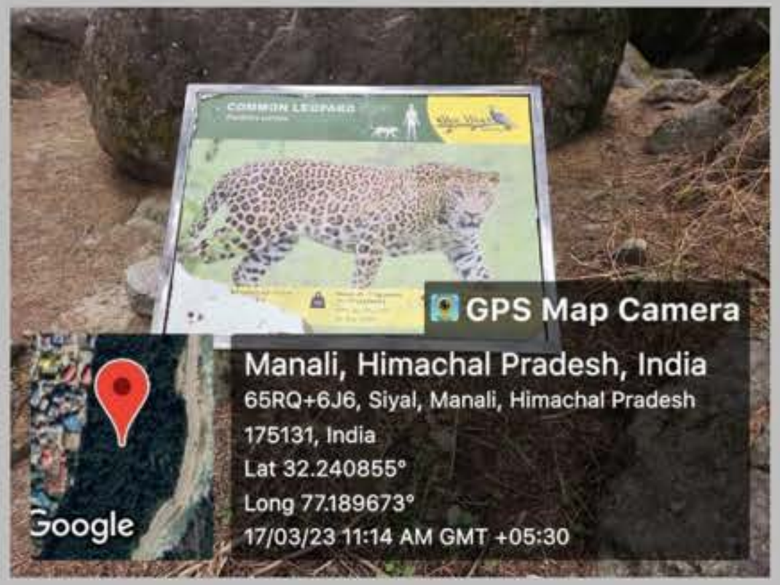
COMMON LEOPARD
GPS Map Camera
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65RQ+6J6, Siyal, Manali, Himachal Pradesh
175131, India
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Long 77.189673°
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Google

CONCLUSION

- The objectives of our topic 'SOLID WASTE MANAGEMENT' were all fulfilled on our field
  trip and all the students learned a lot about :
    - conducting surveys
    - sampling
    - approaching respondents
    - the challenges faced during field studies
    - the way to conduct themselves in the field
- No matter whether the school is urban, suburban, or rural, ecology is everywhere (Lei, 2010).
- There is much to be learned from a vacant lot, the edge of a parking lot, a puddle, or a bush. Field trips can stimulate new learning, increased attitude towards science, trigger
  interest development, and provide many rewards to both the teacher and the students
  (Scarce, 1997).

THANK YOU