Integrated Solid Waste Management Plan for Khau Galli (Food Lane in Kohapur)- A Case Study
Plan de gestión integrada de residuos sólidos para Khau Galli (Food Lane en Kolhapur): un estudio de caso

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ABSTRACT

Solid waste management is an essentiality in this contemporary society, involving countless treatment facilities and many outputs that are circulated back into society. This case study precisely focuses on segregation, management and technological treatments with the co-operation of both Local food vendors of Khau Galli(Food Lane in Kolhapur) and Kolhapur Municipal Corporation. The framework proposes integrations in the existing approaches with simple modifications and research study through different samples over a certain period. This framework may have systematic and efficient solutions addressing sustainability in broader aspects.

The case study is a to finalize community bins from representative areas and to study the composition of solid waste dwelling in the community bins and its effective management. Researching on various methods adopted at various level in order to manage solid waste at its place of generation. The framework suggests methodologies for the sustainable management of solid waste produce by the institute at institute level itself and to implement effective segregation of waste.

Keywords: Food Vendors, Sustainable Management, Municipal Corporation, Solid Waste Management, Segregation, Technological Treatments.

RESUMEN

La gestión de residuos sólidos es esencial en esta sociedad contemporánea, involucrando innumerables instalaciones de tratamiento y muchos productos que circulan de regreso a la sociedad. Este estudio de caso se centra precisamente en la segregación, la gestión y los tratamientos tecnológicos con la cooperación de los vendedores locales de alimentos de Khau Galli (Food Lane en Kolhapur) y la Corporación Municipal de Kolhapur. El marco propone integraciones en los enfoques existentes con modificaciones simples y estudios de investigación a través de diferentes muestras durante un período determinado. Este marco puede tener soluciones sistemáticas y eficientes que aborden la sostenibilidad en aspectos más amplios.

El caso de estudio es finalizar los contenedores comunitarios de áreas representativas y estudiar la composición de los residuos sólidos que habitan en los contenedores comunitarios y su manejo efectivo. Investigación sobre diversos métodos adoptados en varios niveles para el manejo de los residuos sólidos en su lugar de generación. El marco sugiere metodologías para la gestión sostenible de los residuos sólidos producidos por el instituto a nivel del propio instituto y para implementar la segregación efectiva de residuos.

Palabras clave: Vendedores de Alimentos, Gestión Sostenible, Corporación Municipal, Gestión de Residuos Sólidos, Segregación, Tratamientos Tecnológicos.

INTRODUCTION

Kolhapur is situated in the southern part of Maharashtra which is rich in rich in history and culture. Due to religious importance district can be termed as "Dakshin Kashi" of India. It holds a population of 549236. Economically progressive, natural , cultural, historical resources ,center of art, education industry, sports, food, Kolhapuri Chappal etc. As it is tourists centered place apparently food is also an attraction. One such place famous for street food is "khau galli" in Mangalwar peth. Along with the food production the food waste is the upcoming critical problem.here we tried to throw the light on current state of Khau galli. Khau Galli holds in total 32 food stalls out of which 10 are non-veg and 22 are Veg.

The area is mostly crowded in evening.

Significance

•   Research work will help in analyzing various problems, difficulties, challenges faced in concerned field.
•   It helps in suggesting, designing new and effective solutions.

•   Before suggesting any solution/method for management of this waste it is important to know exact composition of the waste or variations in waste with respect to time and season, hence it is important to collect n investigate this waste in proper way, the project work helps us to do that.
•   It gives background for further studies and research work.

METHODOLOGY

Study area

Khau Galli is one of the most attracted places for street food. There are different types of food stalls both Veg and Non-veg. As per the observations there are 46 stalls. Out of these 46 stalls there are 4 non-veg stalls and remaining are Veg. It was observed that the food vendors have provided one bin for the disposal of both wastes i.e., wet and dry waste. Also, along with the private dustbins there are also 2 common bins placed at the center at a distance from each other.

During our project work, we have covered few different bins from different food vendors.

It is also studied that the waste at the end of day is disposed to the nearby municipal bin at Private High School corner in the mixed form. This waste is further collected by the Municipal Waste Collection vehicle every night.

Experimentation

Firstly, the food waste (sample) was collected from different stalls. Total weight of the collected sample was noted. After that the waste was separated in to wet and dry waste. After this separation waste sample was separated into its different types e.g., Bread, onion peels, plastic wrappers, etc. again the weight of these separated components was noted.

To find the Moisture Content sample of mixed waste of 200g was allowed to dry for 24 hrs. in the oven and depending on the obtained reading further calculation of recovering moisture percentage is done.

Composition study

Following are the components that were found during the study:

Paper plates	Food packets (plastic)	Plastic spoons	Paper cups
Butter paper	Onion peals	Wooden sticks	Non veg (bones)
Bread cutouts	Cucumber peals	silver foil	

Moisture content

To measure the moisture content of a sample, the following procedure was followed:
- Weigh the sample to an accuracy of not less than 0.1 kg. Record the weight as *W1*.
- The sample was spread over a number of trays so that the height of the sample in any tray is not more than 25cm.
- It was then placed in a fan-assisted oven at 90 ± 2°C for 24 hours.
- The sample was allowed to cool to room temperature and then it was re- weighed. this weight was recorded as *W2*.
- The moisture content (% H_2O) was then calculated as follows:

$$\%H2O = \frac{(W1 - W2)}{W1} \times 100$$

Finding out moisture content of a sample is important as it helps to decide which method should be chosen for management of waste. If moisture content is more, composting or bio methanation process is suggested, if not, energy can be generated by incineration.

The ideal moisture content for formation of compost is 50% - 60%. Hence, moisture content can be correspondingly increased or reduced to get the desired moisture content for composting.

RESULTS AND DISCUSSION

Results of composition study

        For study of components and characteristics of solid waste generated in Khau Galli area. Their composition, and moisture content was tested, and the data found is as follows-

Sample 1

4th September 2019

Sr no.	Components	Weight	Direct percentage
1	Paper waste	1.250 kg	9%
2	Plastic waste	0.550 kg	4%
3	Organic waste	12 kg	87%
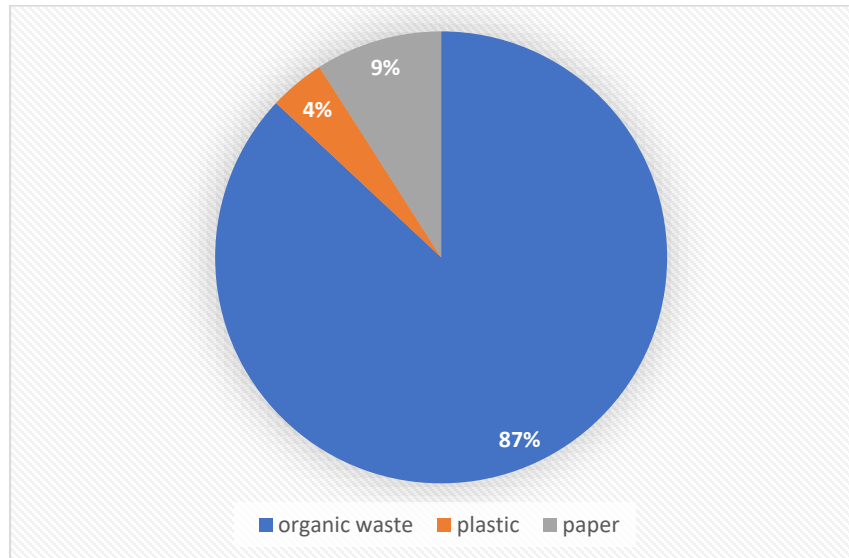
Moisture content = 27.3%

Sample 2

22[nd]September.

Sr no.	Components	Weight	Direct percentage
1	Paper waste	1.500 kg	8%
2	Plastic waste	0.800 kg	4%
3	Organic waste	16 kg	88%
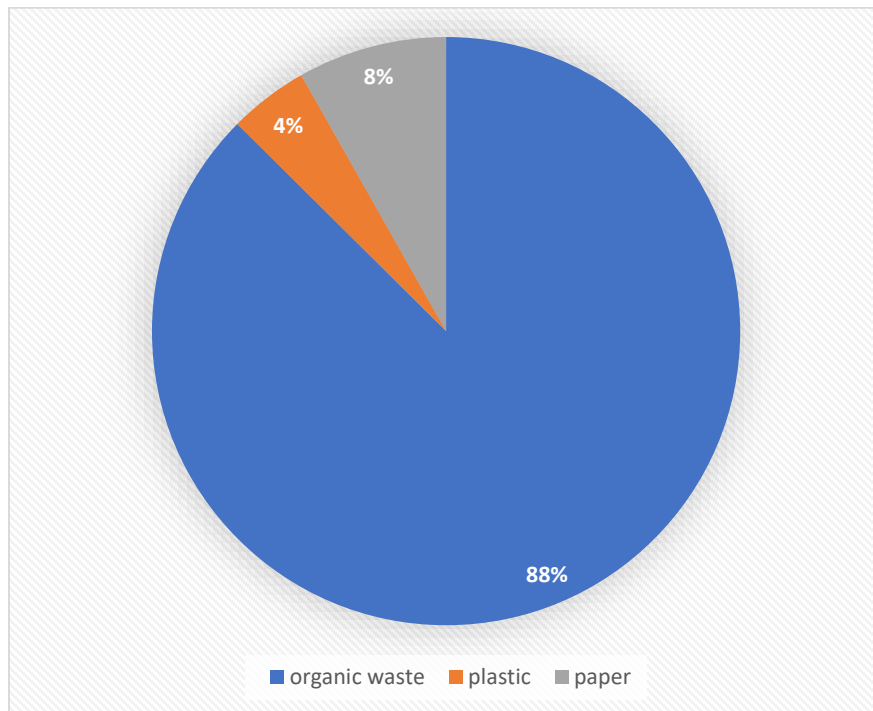
Moisture content = 31.6%

Sample 3

28th September2019

Sr no.	Components	Weight	Direct percentage
1	Paper waste	1.450 kg	9%
2	Plastic waste	0.650 kg	4%
3	Organic waste	14.5 kg	87%
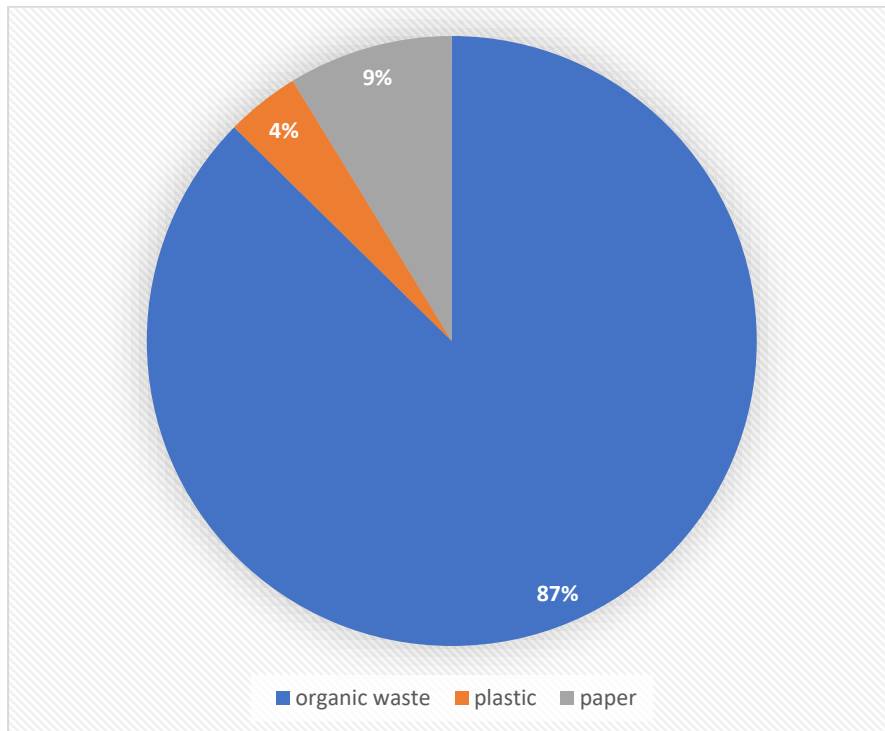
Moisture content = 29.65%

Sample 4

10th October 2019

Sr no.	Components	Weight	Direct percentage
1	Paper waste	1.350 kg	8%
2	Plastic waste	0.590 kg	3%
3	Organic waste	15 kg	89%
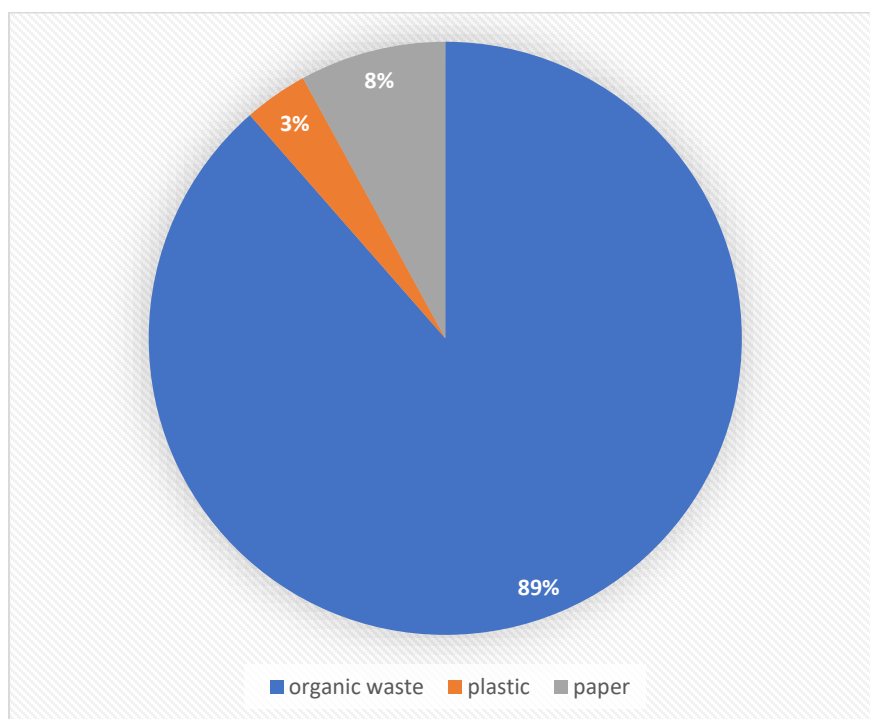
Moisture content = 30.15%

Average readings

Sr no.	Components	Weight	Direct percentage
1	Paper waste	1.387 kg	88%
2	Plastic waste	0.648 kg	4%
3	Organic waste	14.375kg	8%
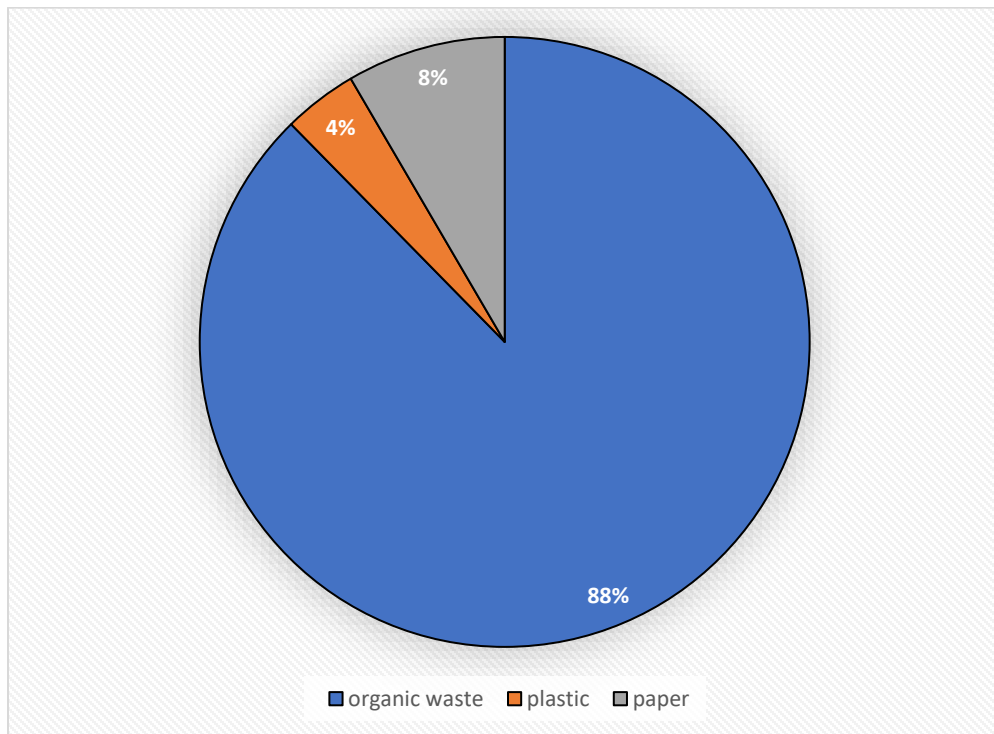
Moisture content = 29.67%

According to the sampling carried out it is found that there are mainly 3 elements in the waste recovered from the Khau Galli area. The main 3 elements are Paper, Plastic and Organic. After analyzing the composition, it was observed that almost 88% of the waste prevailing in the common bins and private food vendors bin is organic waste. The daily chores in Khau Galli are foods and servings. Hence the solid waste generated is mostly food waste i.e., nothing but organic waste. This explains why almost 88% of waste is organic.

After organic waste, plastic waste which was found to be about 4%. This is because of bulk food packets of vendors, disposable bisleri bottles, milk packets come in plastic. Also, the waste bought for disposal is packed in plastic bags itself. The use of plastic can be reduced by adopting alternatives like only bins.

Paper waste is also found in the composition about 8%. Even though paper is recyclable it is disposed along with plastic and organic waste due to laziness or lack of awareness in society.

CONCLUSION

- Separation of waste at source.
- Provision of separate bins for dry and wet waste by food vendors.
- Use of organic waste for organic decomposition and creating manure.
- Recycling of inorganic plastic waste, paper, disposal bottles, etc.
- KMC should provide the facility of 2 separate bins instead of only 1 as per the current state.
- The collection of both dry and wet waste should be done separately by the KMC even if the waste is segregated at source.
- After collection of the waste organic can be used in the Biogas plant present at the dump site without any further separation.
- The recyclable waste can be easily forwarded to recycling.
- This will reduce the load of waste on dumpsite and may also reduce the requirement of waste.

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