SYMBIOSIS
SCHOOL OF ECONOMICS

ENGAGING WITH THE CITY THROUGH RESEARCH

Waste Management Project (Pune City)

CELEBRATING
10 YEARS

Introduction:

Waste management has become one of the most significant urban problems of our time. In 2016-17, Pune city generated around 1600-1700 tons of waste per day. How should this waste be managed? What are the options for urban local bodies? How can academic institutions build awareness among students on waste management such that they could tackle the problems of the future? These questions formed the background intent in the framing of research projects for Second Year BSc. (Economics)- Hons. students of batch 2016-19. The fieldwork for this research was conducted through January to March of 2018. This document seeks to compile some of the important features of the projects undertaken and the experiences therein.

Through the subject matter of waste, the objective of the projects was to help the students in understanding research processes. Students got exposed to various aspects of research such as identification of research problem/question; reviewing literature; different data collection methods; analyzing data; writing research reports, including accepted standards and rules regarding citation and referencing. The research projects were undertaken by 23 groups comprising of 5-6 students each.

The topics chosen by students were diverse, covering a wide range of issues viz. household waste, biomedical, electronic waste, paper waste, restaurant waste, sewage etc. The student groups also ventured into examining waste generated at temples, agriculture markets, and educational institutes. They also engaged in the more people-centric aspects of waste, such as the lives and work of waste pickers. The projects undertaken were exploratory in nature. Students studied the methods of waste collection, management and awareness and the role played by the stakeholders using primary data collection techniques viz. interview, questionnaire, and observation methods. This brief report summarizes the findings of the student project on the following themes:


Student's visit to the Moshi Garbage Depot

Summary of Findings

Household Waste:

Four projects dealt with household waste and surveyed housing societies across several wards viz. Shivajinagar, Gokhalenagar, Model Colony, Magarpatta City, Hadapsar, Dhole Patil Road, Yerwada, Karve Road, Ghole Road, Aundh. The main objectives of their study were to gauge the ground level awareness about Solid Waste management (SWM) rules among residents of Pune.

- Studies found that the respondents were aware of the segregation of waste (dry and wet waste) and practiced it. However, most of the households interviewed were still unaware of rules about Composting, Recycling, Spot Fines, and Payment of User Fees. Some of the respondents raised the issue that the waste-collectors do not care enough about waste segregation, and consequently mix the types of waste up after collecting it from them.
- Respondents also suggested that the instead of having daily wage labourers who come door-to-door, buildings could have trash chutes installed, which shall ease the waste collection for Pune Municipal cooperation (PMC).

Waste Pickers:

Waste pickers are an integral part of the service chain which make our cities livable. Three teams focused on projects related to the working conditions of waste pickers.

- It was found that most of the waste pickers belong to the backward caste.
- Waste pickers complained that they were treated "with suspicion and derision", because of their extreme poverty. Their complaints ranged from not being able to enter certain homes to denial of access to public amenities such as washrooms.
- Harassment by the police was cited as a common complaint, wherein young waste-pickers especially boys were taken into custody on false charges and harassed.
- Most of the waste pickers faced health hazards. Half of the sampled waste pickers in some of the projects reported that they did not receive any free health check-ups.

Electronic Waste:

- In a survey of 180 households, half the sample were unaware of the concept of electronic waste (e-waste) management. Half of the sampled IT companies' employees were ignorant about the laws existing regarding E-waste. Thus, there is a need for greater awareness about handling e-waste and the Extended Product Responsibility strategy that companies should follow.
- It was revealed that 83% of sampled corporate sell their e-waste to recycler.
- Considering majority of electronic products have a life-span of more than six years, e-waste handlers should be given proper incentives to undertake annual collection.

Biomedical Waste:

In the field of biomedical waste, students surveyed selected NABL (National Accreditation Board for testing and Calibration Laboratories) accredited pathological labs and hospitals.

- The survey of hospital staff revealed that the awareness among nurses is not up to the mark. One major reason being, they have to memorize a large number of protocols on waste segregation. Improper waste segregation can distort the biomedical waste management chain, from the source till final disposal.
- Study on awareness of the methods of disposal of sanitary napkins using a sample of 400 girls from different colleges in Pune, revealed that the girls belonging to the higher income category segregated used sanitary napkins from other household waste and were aware of the harmful effects of improper sanitary waste disposal. However, most of the girls were unaware about the "Red Dot" campaign which is aimed at improving the way residents dispose of their sanitary waste (diapers and sanitary napkins). To ensure minimal health risks to waste pickers, it is mandatory to securely wrap sanitary waste in a newspaper and mark it with a red dot.

Food Waste:

To understand the management of food waste, students surveyed restaurants, hotels, catering agencies, college canteens etc. in the wards of Baner, Aundh, Deccan and Viman Nagar.

- There are four types of food wastes in catering industry viz. preparatory waste, serving waste, plate waste and unserved waste. Out of this maximum wastage is from unserved food.
- Studies on restaurants found that maximum waste (67%) occurs due to the excess ordering of raw materials during the preparation stage of food.
- In the catering industry, most food is wasted during weddings because of large variety of food that is displayed. Though a few NGOs collect excess food to distribute among the needy, they do not have adequate storage capacity and hence, food is spoilt before it is distributed; especially in summer months.
- It was found that most college canteens and hostel messes record daily food waste amount. Through an experiment it was found that psychological interventions like posters, emails on food waste etc. could potentially reduce the amount of food wasted.
- Many canteens and messes are following innovative means to handle food wastage like using waste to produce biogas. Though composting of wet waste is also a lucrative option, there is lack of awareness amongst food suppliers about the methods and economic benefits of composting.
- Large number of respondents (93%) among restaurants stated that they segregated waste. However, more than half stated that they do not compost it themselves, and they rely on government bodies for this purpose.

Sewage Waste:

Students surveyed the state of sewage management in Pune. The primary survey was conducted in four slums and four peths of Pune. They found 62% of slums had toilets in their homes, however many slums did not have proper connection to the sewage network. About 70% of the population in this area was aware of various urban rejuvenation programs like Swach Bharat Abhiyan.

Temple Waste:

Temple waste, also called "nirmalya" is typically disposed in rivers and water bodies or dumped in the open. Data was collected from seven major temples of Pune by interviewing shop keepers outside the temples and temple management staff.

- It was found that only 2 out of 7 temples adopted methods of managing waste such as flowers, milk, oil and coconut shells.
- Most of the unsold flower stock is discarded by the shop keepers to be collected by PMC garbage truck. More than half of the floral waste generated is disposed of by the temple to be collected by the PMC garbage truck.

Agriculture Market Waste:

Analysis of the secondary data collected from the APMC in Pune revealed that an average of 44.5 metric tonnes of waste is generated at the Pune Gultekdi market. Also, the waste generated is highest during the monsoon season. In a survey of 130 respondents (traders and commission agents) 57% perceive maximum waste is generated at the time of transportation followed by lack of storage facilities and poor packaging. Majority of the traders had no idea about what happens to the waste after it is thrown away and did not have any willingness to know about it as well.

Paper Waste in Colleges:

One group studied the paper waste management practices adopted by 14 educational institutions across Pune. The findings from the research revealed that in colleges computer-based examinations are not being practiced. However, other means of paperless practices like e-books and online submission of assignments are being widely followed.

Cremation:

One study explored the conditions of crematoriums in Pune. Data collected from 19 Crematoriums across Pune stated that the air pollution control system (APC) is the most popular method and accounts for one-third of all body disposals. The study revealed lack of basic infrastructure at crematoriums

- There are no public toilets in Visharanthwadi and Wanowrie.
- Similarly, facilities like drinking water were absent at crematoriums in Baner, Mundhwa and Kharadi

- Hygiene was found to be substandard in Wadgaon-Budruk, Visharanthwadi, Aundh and Wanowrie.
- Workers have not been provided with basic safety equipment.

Recommendations:

Household
- Extensive guidelines on Waste Segregation.
- Sensitisation and awareness regarding treatment of waste to both households and waste pickers.
- NGOs and education institutions to organise awareness programmes on Reuse and Recycle.
- Regular health check ups of waste pickers.

Food
- Adoption of sound food demand management practices for restaurants, hotels, messes and catering agencies.
- Better synergy between caterers and NGOs that collect and redistribute surplus food.
- Incentivizing for undertaking composting at the source.
- There is a need for policy guidelines for the food waste management practices to be followed by Indian restaurants.

Bio-medical waste
- Training on biomedical waste mangement for nurses.

Menstrual Hygiene:
- Need to create awareness of "Red Dot" campaign.
- Adolescent education programs to include menstrual hygiene and menstruation.
- Provision of sanitary bins in all schools and colleges.

Agricultural Market Waste
- Awareness about disposal of fruits and vegetable waste among sellers, farmers and APMC officials.
- APMC to keep a record of waste generated in the market yard with separate details of fruit and vegetable waste.

Temples "Nirmalya"
- Temples to follow vermicomposting so that it could be used as manure in their gardens.

Crematoriums
- To have basic facilities like drinking water, toilets etc.
- Digitalization of records.
- Regular inspection to fulfill the needs of the workers.

Scope for Further Research:

- Status of practices adopted by small healthcare facilities needs to be studied to find out the proper adoption of bio-medical waste rules.
- Studies should be undertaken to reduce the cost of recycling units that colleges incorporate.
- More experimental design studies are required to find out the appropriate awareness programmes that bring about a change in consumers' mindset to reduce food and household waste.
- Cost-benefit analysis of various cremation procedure should be conducted. Factors affecting preferences of cremation processes should be explored further.
- Comparison of efficiency of local government organizations and private handlers of e-waste to be conducted.
- Understanding the determinants of food wastage among Indian households can help to identify the measures taken to reduce plate food waste in social functions.

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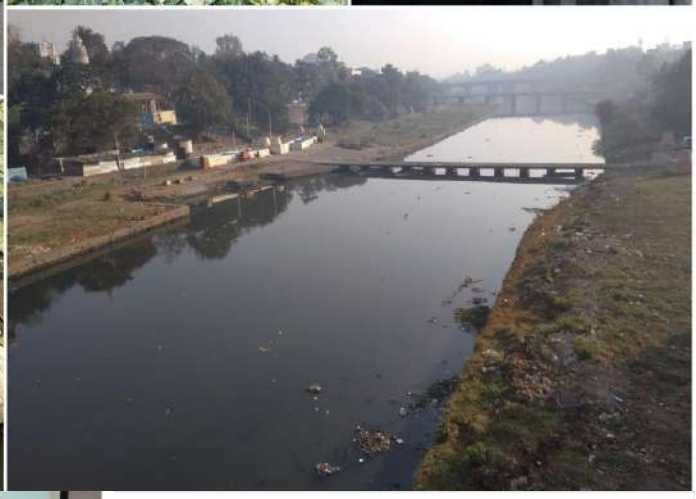

कचरा व्यवस्थापनात सातत्य हवे

म. टा. प्रतिनिधी, पुणे

'कचरा व्यवस्थापनामध्ये पुणे हे सर्वोत्तम शहर असून, येथे घरोघरी ओला आणि सुक्या कचरा असे वर्गीकरण केले जाते. हे वर्गीकरणाचे प्रमाण देशात सर्वाधिक आहे. तसेच, स्वच्छ संस्थेच्या उपक्रमही फायदेशीर ठरत आहे. सार्वजनिक खासगी भागिदारीत (पीपीपी) व काही खासगी संस्थेकडून कचरा व्यवस्थापनाचे प्रकल्प राबविले जात आहेत. मात्र, त्यात सातत्य ठेवण्याची गरज आहे,' असे मत इंडियन कौन्सिल फॉर रिसर्च ऑन इंटरनेशनल इकॉनॉमिक्स रिलेशनच्या संचालक मंडळाच्या अध्यक्ष डॉ. इशेर जज अहलुवालिया यांनी व्यक्त केले.

सिम्बायोसिस विश्वविद्यालय अभिमत विद्यापीठाच्या सिम्बायोसिस

डॉ. अहलुवालिया

डॉ. इशेर जज अहलुवालिया यांचे मत

पुणे, डॉ. अहलुवालिया बोलत होत्या. सिम्बायोसिस सेंटर फॉर वेस्ट रिसोर्स मॅनेजमेंटचे संचालक प्रा. शरद काळे उपस्थित होते. सिम्बायोसिस स्कूल ऑफ

कचरा, उरलेले अन्न, इलेक्ट्रॉनिक कचरा, बायो मेडिकल कचरा, मानवी शरीराचे, आदींचे व्यवस्थापन याबाबत विद्यार्थ्यांनी संशोधन केले होते. निवडक ग्रुपमधील विद्यार्थ्यांनी प्रमुख वक्त्यांसमोर संशोधनाचे सादरीकरण केले.

अहलुवालिया म्हणाल्या,'कचरा व्यवस्थापनामध्ये निर्माण होणारा कचरा, कचऱ्याचे वर्गीकरण किंवा विल्हेवाट याबाबत खात्रीलायक आकडेवारी उपलब्ध नाही. त्यामुळे कचऱ्याचे प्रमाण अंदाजे निश्चित केले जाते. कचरा डंपिंग केल्या जाणाऱ्या ठिकाणच्या नागरिकांच्या आरोग्याचे परीक्षण करण्याची गरज असून, सर्व नागरिकांमध्ये कचरा व्यवस्थापनाच्या कार्यांबाबत जागरुकता आणण्याची गरज आहे. नागरिकांना ओला व सुका कचरा एकत्र न करण्याबाबत

hindustantimes

Pune Symbiosis student research reveals for waste management, best to work like an Egyptian

Based on Swot (strengths, weaknesses, opportunities, and threats), student research showed Egyptian model renders sewage management process much more efficient

॥वसुधैव कुटुम्बकम्॥
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INTERNATIONAL (DEEMED UNIVERSITY)

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