

Urban Stakeholders in Waste Management: A Case-study of Puri town, Odisha

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Abstract- All communities, especially those that are most impacted, must have a critical role to play by finding ways to integrate livelihood and waste management issues in a socially just manner. If not, the waste will simply move down the path of least resistance to the economically disadvantaged. New views on waste management are taking shape based on experience with the environmental, socio-economic and institutional ramifications of Over the next two decades, growing urbanization in India will result in a massive increase of waste. By the year 2024, as workers migrate to urban areas, the urban population is expected represent 40 percent of the overall population. Growth of human population, increasing economic activities and raising standards of living generates more municipal solid waste, which has become a serious environmental problem in the recent years. Increased urbanization and rapid industrialization along with changing lifestyle have created accumulation of huge amount of waste and garbage in the urban areas and the absence of proper disposal and recycling has led to severe environmental hazards. The problem is severd in urban areas because of migration from rural areas at an alarming rate for want of employment and better quality of life. Municipal solid waste is normally disposed of in an open dump in most Indian cities and towns, which is improper method and such crude dumps pose environmental hazards causing ecological imbalances with respect to land, water, and air.

Keywords: Socially just, waste management, urban waste.

INTRODUCTION-

The waste problem will be acuter in newly developing townships, as they take on the character of small cities. The urban poor will unfairly bear the brunt of the waste problem since their living areas, which are usually slums, will most likely be selected as waste dumping sites. The poor cannot expect any municipal

services to improve their living conditions. Urban poor communities that are enlarged in cleaning the city through waste collection, sorting and recycling will themselves be on the receiving end of the waste problem.

The scenario in Odisha is no different from the rest of the country. Odisha has a total population of 4.2 crore, as per Census 2011. There are 111 urban local bodies in odisha comprising of five Municipal Corporations, 45 municipalities and 65 notified council areas councils in the state with a total population of 59.8 lakhs accounting for about 14percent of the total population of the state.

Efficient MSW management is essential in maintaining hygienic condition leading to:

- Lesser health issues of inhabitants
- Better living environment
- Improved economic prosperity
- Cleaner surroundings with cleaner drains for storm water flow
- Cleaner water sources and safer neighborhoods

REVIEW OF LITERATURE

The search and review of the literature is a critical evolution, analysis and synthesis of existing knowledge relevant to the research problem. It is critical in that you are required to evaluate what you read? It is an analysis in that you are required to extracts different kinds of information from what you read. It is a synthesis in that you are required to show the relationships that exist between different studies and show how these relate to your own research. You are aiming to assess critically what definitions of the topic have been offered and how they have been used

and to evaluate the methodological approaches employed and to identify gaps in empirical work and assumptions used. A literature review is not therefore a summary, synopsis or series of annotations or a description of previous work. A good literature review exhibits technical competencies in searching for and selecting items has clarity of expression in writing and arrangement of materials; undertakes argumentation analysis in the evaluation of existing work; and is used to structure the reasons of your proposed research and to show where your research, once completed, relates to existing knowledge.

- Some survey reports completed in the past by Solid waste management & resource Mobilization Centre (SWMRMC) look at the total solid waste generation of small shops and house hold in Kathamandu and Patan. A survey on “Recycling and Recyclable Material generation in Households in residential locations in Kathamandu” 1990, conducted by SWMRMC generated data on recyclable materials and characterize household understanding and knowledge of various aspects of recycling. Paper presented by Mr. L.C Rayam , Deputy General Manager , SWMRMC, at fourth Regional Workshop SWMRMC December 31st and November 1st 1990 , states that properwaste handling costs a lot money which developing countries cannot afford and at the same time the people do not get the direct output from it. Therefore, he further emphasized that SWMCRA should think about the cost involved in solid waste handling and a treatment system as a resource recovery process. At the same symposium, participants have come to a conclusion that “Community Participation being an integral part of SWMRMC’s service approach should be fostered not only in regard to waste handling and waste disposal but also in reduction at source.
- Study on the physical composition of municipal solid waste in Kathamandu conducted by NESS Pvt. Ltd in 1990 revealed that the municipal solid waste composition has undergone drastic change in the last decade. Over the year proposition of compostable biodegradable waste has declined significantly, while non compostable organic waste fraction has increased. These features point to the fact that the municipal waste of

Kathamandu can be best reused by transformation into solid waste fuel briquettes than by composting. By transformation in to solid waste fuel briquettes than waste by volume and 78 percentage of waste by wait can be reused. In other words, the same fraction of waste is reduced in the landfill site fir final disposal. This option can not only extend the life of landfill but also provide an alternative source of energy by utilizing unused waste product.

- According to Sujauddin et .al. (2008) the generation of waste is influenced by family size, their education level and the monthly income. Households attitudes related to separation of waste are affected by the active support and investment of a real estate company, community residential committees’ involvement for public participation (Zhuang et al., 2008) and fee for collection service based on the waste volume or weight (Scheinberg, 2011). Gender, peer influence, land size, location of household and membership of environmental organization explain household waste utilization and separation behavior (Ekere et al., 2009). Organizing the informal sector and promoting micro-enterprises were mentioned by Sharholy et al. (2008) as effective ways of extending affordable waste collection services.
- In relation to recycling Gonzalez-Torre and Adenso-Diaz (2005) reported that social influences, altruistic and regulatory factors are some of the reasons why certain communities develop strong recyccli Researchers have documented how an adequate legal framework contributes positively to the development of the integrated waste management system (Asase et al., 2009) while the absence of satisfactory policies (Mrayyan and Hamdi, 2006) and weak regulations (Seng et al., 2010) are detrimental to it.ng habits.
- There are several factors that have facilitated increase in the volume of solid waste generated. Oneof the factors that have led to increased solid waste generation is rapid urbanization (UNEP,2007). Urbanization comes with expansion of towns which manifests through the growth of social and economic infrastructure/services and industrialization. The

growth in such services swarrants the increase in population in such areas. An increased population automatically means increased demand for not only social services but also consumables which potentially present a larger base for waste generation-in most cases solid waste.

RESEARCH GAPS AND INTRODUCTION OF RESEARCH AREA

on the eastern coast of India, along the blue water of the Bay Of Bengal the unique state of Odisha is known for its magnificent temples, sunny beaches, colorful wild lives traditional tribal culture and a rich heritage. To her credit Orissa has housed the important pilgrimage center for the Hindu Puri, one of the four dhams.

Puri is one of the most popular and visited holy cities of India due to the temple of Lord Jagannatha and the platform called “Ratnavedi”. Each year more than 1 million people visit the city and especially during the grand festival Ratha Yatra, which has 1.5 million habitants. The waste management and the water management system are under serious pressure from a population that increases during the tourists’ season and due to the land uses. The most common method of disposing of daily garbage in Puri is to throw the waste in the few bins provided by the Municipality, otherwise on the streets and the drains waste collection is insufficient and does not cover the entire city.

After under taking preliminary work and realizing a study, the Indian Environmental society (IES) in corporation with the Puri Municipality have recognized the need for increasing the capacity of the communities within Orissa state – Puri district –to develop and use best waste management practices and policy.

RESEARCH OBJECTIVES-

- To make a profile analysis of the sample population.
- To assess their level of awareness and estimate their knowledge about SWM.
- To locate their participation in SWM.
- To identify the challenges involved in SWM.
- To document information from the functionaries about the problems & prospect of SWM.

RESEARCH DESIGN AND SETTING-

The study has adapted exploratory design for developing rich research insight in to the topic identified. The conceptual analysis is based on the archives method and presented through a descriptive design while the data collection and data analysis are being done by the use of an exploratory design. Particularly, the empiricism part of the study contains an exploratory design to unearth different facets of the issue.

Table indicates the research tools used.

Sl. No.	Tools used	Purpose
1	Interview schedule	For collecting information from the sample
2	Personal interaction	To elicit information from the key respondents

Time Frame:

The study was lunched on January 2016 and followed by the following time schedule to complete the research work.

Sl. No.	Time frame	Task accomplished
1	3 rd January 24 - 7 th January 24	Topic discussion & finalization of topic
2	9 th January 24 - 10 th February 24	Overview of literature
3	11 th February 24 – 16 th February 24	Identification of dimension of problem & setting the objectives
4	18 th February 24 – 29 th February 24	Detecting the universe & sampling
5	2 nd April 24 – 7 th April 24	Setting the tools for data collection
6	8 th April 24 – 13 th April 24	Preparing interview schedule

7	14 th April 24 – 24 th April 24	Field study & data collection
8	25 th April 24 – 7 th May 24	Data analysis & drawing conclusion
9	8 th May 24 – 14 th May 24	Preparation of draft report
10	18 th May 24	Final report submission

The study depends on the systematic or the Nth term sampling method for deciding the universe. The researcher has detected the areas where the methods of SWM are followed by the people. On that basis the study concentrated on three areas of puri town named as, Dattatota, Bali sahi, Harchandi sahi. Then out of

the total households of this areas i.e,220, the researcher has selected 55 households as sample units relying upon the Nth term or, systematic sampling method. Every 4th household of a particular area has been taken as the sample unit in this method. TABLE;

The sample area

Districts (Town)	Sl. no.	Locality	No.of house hold	House hold selected
Puri	1.	Duttatota	120	30
	2.	Balisahi & Harachandi sahi	100	25
Total			220	55

After selecting the exact number of households taken to be in the study the researcher has chosen the households in each sahi in every 4th household of a particular area as the sample unit in Nth term sampling method.

ANALYSIS AND FINDINGS

There are fertile prospects for public participation in solid waste management in Puri Municipality Council. The best way to do is by showing the people that they are worth by involving them in the initial planning stages. The people's ideas should be included in the initial deliberations and discussions so that they can see themselves as part of the decision-making structure. This is important because the people themselves have been responsible for both the good and bad practices at present and therefore for any change to be concrete there is need to involve the people right from the start by way of consultations. This will also help in taking the relationship between the public and the authorities to another level of mutual understanding and interdependence. With this, the operations will most likely be smooth and less costly both politically and financially.

Apart from involving the people is taking the initial decisions, the Town Council should strategically plan for sensitization of the people. Several solutions may be brought at table and agreed upon. But just like the findings show, the people feel that the first step should be to sensitize the public about the whole issue of solid waste management. Although there is agreement that sensitization should come prior to implementation of the solid waste management programme, in actual sense, effective and meaningful sensitization is

planned when the whole program package is complete. That is when one can know what exactly to sensitize about and how. It is my suggestion therefore that sensitization should not be done for the sake of it and basing on mere thought but after a common agreement on the program of solid waste management for purposes of being systematic and thorough.

The imminent bye-law by Puri Town Council on solid waste management with a specific focus on waste collection fees structure is one of those items that need to feature in the sensitization. This the Town Council may be already planning but the concern should also be on the basis for determination of the fees structure. This is a critical issue and the fact that it will come in form of a law that will demand conformity and it requires utmost care on the side of the law makers. To be able to come out with an acceptable fee structure the Town Council authority should do a well-planned and empirically supported consultation or survey that will ensure determination of win financial legislation for solid waste collection and management

The Town Council has been doing social networking with a few good-willed individuals. This is a good thing and thus a good base on which to launch a fully-fledged campaign on networking. The potential for scaling up this venture should be explored and given attention because the Town council administration will need the members of the public and vice versa. There are people who possess or at least have access

and control over useful resources that can be used for better solid waste management. Therefore social networking should be seriously considered as it will help in reaching cost effective ways of dealing with solid waste in the area. Since there are potential economic benefits that the Town Council is aware of that can be attained from business in solid waste, a plan to give elementary training to interested members of the public may be worth while with time. It will be a positive investment for future solid waste management which is community led other than led by the administration because in that way, it will be cheaper and yet sustainable. Just like the Town Council officials revealed that they have seen it successfully work in Khorda District.

It is understandable that all local government units operate under meager financial resources and thus have to set their priorities right. In most cases, solid waste management misses out in the strategic plans and consequently in the budget. The defense for this omission may be that waste management is not an economically rewarding investment and therefore not very much a priority. In the contemporary world today where the environment is at stake and where sustainable development is the way to go, it is high time that solid waste management was prioritized and budgeted for because it is one of the problems that have far-reaching effects on the environment when not mitigated before it gets overboard. It is therefore my suggestion that the Town Council deliberately includes solid waste management as a priority in the annual budgets.

The explosion in world population is changing the nature of solid waste management from a low priority localized issue of an internationally pervasive social problem. Risk to public health, and the environment, due to solid waste in large metropolitan areas are becoming intolerable. Puri town is currently facing the municipal solid waste dilemma, for which all element of the society is responsible. Here in this town, community sensitization and public awareness is very low. There is no proper system of organic, inorganic and recyclable waste at the household level. Though there is an adequate legal frame work existing in the country to address Municipal solid waste, but what is lacking is its implementation. There has to be a systematic effort in the improvement in various factors like institutional arrangement, financial provisions, appropriate technology, operation management,

human resource development, public participation, awareness and policy and legal frame works for an integrated solid waste management system.

Considering the problems of solid waste various preventive measures to be taken. The first and most important aspect is awareness among the general public for such a problematic aspect of environment. Adequate budget provisions should be made for this. Simultaneously regular monitoring and reporting of sewage and urban solid disposal should be made. Of course, presently, the urban solid waste management is the sole responsibility of the concerned Municipality and the Ministry of Environment has initiated several schemes for survey of urban Municipality area and disposal of biomedical waste through different Non-government agencies.

CONCLUSION

This chapter presents the conclusive statements drawn from the discussion of the findings and then some recommendations to Puri Munisipality & NGOson the way forward with regard to public participation in solid waste management. The level of public participation in solid waste management at present in Puri Town Council is low. There is no structure that allows for a more synergistic relationship between the public and the Town Council authorities. The Town Council, being less than a decade old is more pre-occupied with infrastructural projects at the moment leaving the solid waste management issueless attended to and with fewer resources for the venture. This has consequently given room for people to dispose of waste carelessly since the issue has not been practically adopted as a priority in the Town Council as yet. Everyone has the discretion to decide what best suits them as far as solid waste management is concerned.

Waste reduction through waste reuse is a primary function of the public at the stage of waste generation. In Puri Town Council, there has not been effort towards waste reduction. The people do not possess knowledge on the benefits to the environment and consequently sustainable development when the volume of waste is reduced. There is no appreciation of the fact that solid waste affects sustainable development. The required circumstances for effective solid waste reduction are not prevalent in Puri Town Council given the low level of social capital

established among the people. The characteristic capitalistic and individualistic life style makes it harder for solid waste reduction to be collectively achieved. It leaves the Town Council with fewer alternatives for sustainable solid waste management, albeit waste reduction can also still be provoked. Knowledge about the importance and benefits of sorting waste is one thing, and having knowledge on the recyclable waste material is another. People do realise that it is a good thing to sort solid waste so that not all of it is dumped together. The intention is to ease the management of the waste by having some of the waste items recycled. The knowledge base about recyclable items among the people of Puri Town Council is minor and very low. People know little about recyclable items and this in itself forms a barrier to waste sorting, one needs to know which items to particularly sort-out, without this knowledge, it becomes useless and unlikely so to happen. From the attitudes of the people, it is very clear that not all is lost. The future of sustainable solid waste management in the town Council is bright but only so if the potentials of the people to participate are delicately and purposively tapped. There is willingness by the public to participate. They are ready to play their role in solid waste management, but as they unanimously agreed that they cannot manage on their own, they need the technical guidance of the authorities. Collaboration is thus very important for success of any project and solid waste management is not an exception. The willingness among the people to work together with one another and with the authorities for a common good is a starting point for a synergy which will move from just mere complementarily through embeddedness to a co-productive relationship which is the epitome of participation.

The effort is not sufficient for the proper management of solid waste generated in Puri town. Lack of co-ordination between Puri Municipality and waste management plant is the major problem, as Puri Municipality is the owner of the plant, but could not satisfactorily help the plant in varied way. Municipality, political authority and most importantly the common people should be conscious about this problem. However, awareness among the general public through mass media, meetings, posters and activities of different NGOs is a preventive measure for such an environmental degradation due to solid waste.

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STRUCTURED INTERVIEW FOR RESIDENTS

PUBLIC PARTICIPATION IN SOLID WASTE MANAGEMENT IN PURI TOWN

PART I

IDENTIFICATION OF DATA

1. Type of Respondent.

- a) Resident
- b) Market Vender
- c) Trader
- d) Other
- (specify).....

- a) Bali sahi
- b) Dattatota
- c) Harchandi sahi

4. Sex.

- a) Male
- b) Female

2. Premise Ownership.

- a) Private owner
- b) Tenant

5. Highest level of Education.

- Never went to school
- Primary level
- Secondary Level
- Higher Institution/University level

3. Ward

PART II

ROLE PLAYED BY RESIDENTS IN SOLID WASTE MANAGEMENT

Do you have any waste containers in your home/shop/stall?

- a) Yes
- b) No

7. Do you sort the waste generated in your home/shop/stall?

- a) Yes
- b) No

8. Are there any items from your waste that you reuse?

- a) Yes
- b) No

Please Specify.....

9. Who takes the waste from your home/shop/stall for disposal?

- a) Myself
- b) House keeper
- c) Someone else in the home
- d) Private waste collector
- e) Town council

10. Do you pay for collection of waste from your home/shop/stall

- a) Yes
- b) No

11. If yes, in your view, is the fee affordable?

- a) Yes
- b) No

12. Where is the waste taken for disposal?

- a) Land fill
- b) Collecting center
- c) A pit for burning
- (Please specify).....
- d) I do not know
- e) Other

13. How many times in a week is waste taken from your home/shop/stall for disposal?

- a) Once
- b) Twice
- c) More than twice but not daily
- not know
- d) Daily
- e) I do

14. What do you do about waste you find outside your home/shop/stall?

- a) Pick it and put it in a nearby waste container
- b) Move on

PART III

ROLE THE RESIDENTS CAN PLAY IN SOLID WASTE MANAGEMENT

15. Do you think you can reduce on the amount of waste you generate in your home/shop/stall?

- a) Yes
- b) No

24. If yes, how?

17. Do you think there are some waste items which can be reused but you are not reusing?

- a) Yes
- b) No

Please Specify.....

18. Do you think it helps to sort waste before disposing it of?

- a) Yes
- b) No

19. Which waste items do you think should be sorted for recycling?

- a) Hard plastics
- b) Polythene
- c) Glass
- d) Paper
- e) Metals
- f) I do not know

20. In future, are you willing to pay for collection of the waste that you generate in your home/shop/stall?

- a) Yess
- b) No

21. Do you think it is necessary for you to work together with other residents/traders/market vendors for better waste management?

- a) Yes
- b) No

22. Do you think it is necessary for you residents/traders/market vendors to work together with the Town Council in managing waste?

- a) Yes
- b) No

23. Do you think the residents/traders/market vendors are capable of managing the waste they generate without help from the Town Council?

- a)Yes
- b)No

SEMI-STRUCTURED INTERVIEW FOR RESIDENTS PUBLIC PARTICIPATION IN SOLID WASTE MANAGEMENT IN PURI TOWN

PART I: IDENTIFICATION DATA

1. Type of Respondent
2. Sex.
3. Highest level of Education

PART II: RESEARCH QUESTION ITEMS

a. Tell me about how you handle waste in your home/stall/shop. (*Probe: Is it the best way? How has it worked for you? Do you have any challenges in the way you handle waste?*)

b. What do you think you can start doing to improve on the way waste is handled in your home/stall/shop? (*Probe: Will it require you to use more resources? What resources? Why have you not yet adopted these methods?*)

c. Tell me about the relationship between you and the Town Council Authorities in dealing with waste. (*Probe: Is the relationship direct or through a third party? Do you have any payment arrangements with the Town council or the third party for waste? Are there any reasons for difficulty to work with the Town Council on waste?*)

d. What do you think the Town council should do for a better relationship with the residents/market vendors/traders in dealing with waste? (*Probe: Is there need for policies on waste? Laws? Sensitization?*)

Thank you very much for your time, and I want to reiterate that the information you have given will only be used for the purposes of this study and not anything else,

Focus Group guiding questions

ISSUES FOR DISCUSSION IN FOCUS GROUPS Associated with different types of NGOs:-

1. Where is the waste got from (what kind of places)
2. How is the solid waste packaged, what is done about it before collection (how much volume)
3. Willingness by the people to pay for waste collection

4. Where is the waste taken (is it disposed of at acceptable places? How is the solid waste treated at the disposal sites-burned? Composited?)
5. What has been the role of the Town Council in solid waste management?
6. What more should be done by the Town Council in solid waste management?