

# URBAN ECOLOGY AND ENVIRONMENT POLLUTION: A COMPARATIVE STUDY OF WASTE MANAGEMENT PRACTICES IN VISAKHAPATNAM CITY AND VIZIANAGARAM TOWN IN INDIA.

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## INTRODUCTION

In 20<sup>th</sup> century excessive technological growth created an unhealthy environment.

The human environment endows every individual with a conducive atmosphere for life and growth. Most of our problems have roots in the destruction of environment. This destruction is the result of development pattern. In the name of development projects, the government is allowing clearance of forests and massacre of wild life. We have to resist this destruction in the guise of development.

Baba Amte, Medha Patkar, and Sunderlal Bhauguna have shown us the way. Voluntary organizations spread the message of environment protection. Air pollution, Noise pollution, traffic congestion, chemical contaminants, radiation hazards, over crowding have become part of our life. These health hazards are integral features of high-tech economic system. Nature no longer poses a danger to the modern man. But man is becoming threat both to himself and nature.

Indians eat food with highest toxic pesticide residues. Deforestation and soil erosion have raised their ugly heads. Development projects led to deterioration of the natural environment. The lack of basic amenities, unhygienic conditions of living, natural disasters and occupational hazards haunt the deprived and underprivileged masses. Large dams cause large scale destruction of natural resources in surrounding areas.

The problem of pollution is spreading its tentacles in different fields. The land in which we live, the air that we inhale, the water we drink and the sound that we hear-are all polluted. The key to man's ill-health largely in the environment. In fact, much of man's ill-health can be traced to adverse environmental factors such as water pollution, soil pollution, air pollution, poor

housing conditions and environmental sanitation. Often man is responsible for the pollution of his environment through urbanization, industrialization and other human activities.

As urbanization continues to take place, the Management of solid waste is becoming a major public health and environmental concern in urban areas of many developing countries. The concern is serious, particularly in the capital cities, which are often gateways to the countries for foreign diplomats, businessmen, and tourists. Poor visual appearance of these cities will have negative impacts on official and tourists visits and foreign investment.

## **WASTE MANAGEMENT**

Waste management is the collection, transport, processing, recycling or disposal, and monitoring of waste materials. The term usually relates to materials produced by human activity, and is generally undertaken to reduce their effect on health, the environment or aesthetics. Waste management is also carried out to recover resources from it. Waste management can involve solid, liquid, gaseous or radioactive substances, with different methods and fields of expertise for each.

Waste management practices differ for developed and developing nations, for urban and rural areas, and for residential and industrial, producers. Management for non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management for non-hazardous commercial and industrial waste is usually the responsibility of the generator.

## **DISPOSAL METHODS**

Disposing of waste in a landfill involves burying waste, and this remains a common practice in most countries. Landfills were often established in abandoned or unused quarries, mining voids or borrow pits. A properly-designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials.

## **INCINERATION**

Incineration is a disposal method that involves combustion of waste material. Incineration and other high temperature waste treatment systems are sometimes described as "thermal treatment". Incinerators convert waste materials into heat, gas, steam, and ash. This method is used to dispose of solid, liquid and gaseous waste. It is recognized as a practical method of disposing of certain hazardous waste materials (such as biological medical waste). Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants.

## RECYCLING METHODS

The recycling of complex products (such as computers and electronic equipment) is more difficult, due to the additional dismantling and separation required. Waste materials that are organic in nature, such as plant material, food scraps, and paper products, can be recycled using biological composting and digestion processes to decompose the organic matter. The resulting organic material is then recycled as mulch or compost for agricultural or landscaping purposes. In addition, waste gas from the process (such as methane) can be captured and used for generating electricity. The intention of biological processing in waste management is to control and accelerate the natural process of decomposition of organic matter. The household organic waste (such as kitchen scraps and plant cuttings) are collected in a dedicated container and then composted.

## AVOIDANCE AND REDUCTION METHODS

### Waste Minimization:

An important method of waste management is the prevention of waste material being created, also known as waste reduction. Methods of avoidance include reuse of second-hand products, repairing broken items instead of buying new, designing products to be refillable or reusable, encouraging consumers to avoid using disposable products.

### Waste handling and Transport:

Waste collection methods vary widely between different countries and regions. Domestic waste collection services are often provided by local government authorities, or by private industry. Some areas, especially those in less developed countries, do not have a formal waste-collection system. Examples of waste handling systems include:

1. In Australia, curbside collection is the method of disposal of waste. Every urban domestic household is provided with three bins: one for recyclables, another for general waste and another for garden materials - this bin is provided by the municipality if requested. Household waste is segregated: recyclables sorted and made into new products, and general waste is dumped in landfill areas. Energy is produced from waste as well: some landfill gas is captured for fuel or electricity generation.

2. In Europe and a few other places around the world, a few communities use a proprietary collection system known as Envac, which conveys refuse via underground conduits using a vacuum system.

## WASTE MANAGEMENT CONCEPTS

### Waste hierarchy:

It refers to the "3 Rs" reduce, reuse and recycle. The waste hierarchy remains the cornerstone of most waste minimization strategies. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.

### Extended producer responsibility:

This means that firms which manufacture, import and/or sell products are required to be responsible for the products after their useful life as well as during manufacture.

### Polluter pays principle:

It is a principle where the polluting party pays for the impact caused to the environment. With respect to waste management, this generally refers to the requirement for a waste generator to pay for appropriate disposal of the waste.

## PROBLEMS OF WASTE MANAGEMENT IN DEVELOPING COUNTRIES

In the last 20 years, a number of solid waste management projects have been carried out in developing countries, in collaboration with external support agencies. Some projects were successful in producing lasting impacts on the improvement of solid waste management in developing countries. However, many projects could not support themselves or expand further when the external agencies discontinued their support. A number of technical, financial, institutional, economic, and social factors contribute to the failure to sustain the projects.

The recipient countries and cities initially to accept whatever resources are provided to them without due consideration to subsequent resource requirements. The external support agencies do not fully understand socio-economic, cultural, and political factors influencing the selection of appropriate solid waste management systems. There may be limited follow-up support from the external support agencies. There is need for improving the sustainability of the collaborative projects. There is need for developing self-financing schemes and raising awareness of the public.

The Constraints and problems vary from country to country and from city to city. The problems include low collection coverage and irregular collection services, crude open dumping and burning without air and water pollution control. Many officers in charge of solid waste management, particularly at the local level, have little or no technical background or training in engineering or management. In general, solid waste management is given a very low priority in developing countries, except in capital and large cities. As a result, very limited funds are

provided to the solid waste management sector by the governments. Users' ability to pay for the services is very limited in poorer developing countries. Legislation related to solid waste management in developing countries is usually fragmented. Hence comprehensive legislation is enforceable which is required for sustainable development of solid waste management systems. The lack of a coordinating body among the local governments often leads to disintegrated and unsustainable programmes for solid waste management.

## **CONSTRAINTS OF EXTERNAL SUPPORT**

There is the lack of human resources with sufficient experiences and knowledge of solid waste management in developing countries. Piece-meal, or not comprehensive approaches taken by external support agencies, often results in unsustainable solid waste management projects. For some donor agencies, solid waste management may not be priority sector for support. As a result, there is often limited amount of funds that can be allocated to the sector. Because of its inherent nature, it is not possible generate revenues for solid waste management. In developing countries where the willingness and ability to pay for solid waste management services are low. Often, the appropriateness of a technology to be used in a developing country is not fully assessed, and the technology is adopted based on the norm and experience of the donor country. . The lack of understanding of local cultures and ways of life by the external support agency is often a cause of failure of a collaborative project.

## **MEASURES FOR SUCCESSFUL COLLABORATION**

The approaches to solving solid waste management problems in developing countries have been piece-meal and not well coordinated. It is necessary to combine support from different international aid agencies to make a collaborative project more comprehensive and long-term/continuous. This requires development of partnership among them removing organizational egos and sharing and contributing their resources. Many solid waste management projects in developing countries suffer from the lack of coordination among the relevant agencies; there is lack of clear roles defined for these agencies in solid waste management. For sustainable solid waste management in developing countries, human resource development should always be part of the external support package. The strengthening of human resource should be the first priority in the National coordinating unit and one or two local governments in short term and support to higher educational institutions is a long term programme. Overall solid waste management plans at both the national and local levels are essential for utilizing limited resources most effectively

The governments of developing countries have limited funds for solid waste management and develop measures to reduce and recover the expenditure and increase revenues where possible. Private sector participation in solid waste management collection and disposal services is also a way to reduce the financial burden of the government. Effective management of solid waste requires the cooperation of the general public. This sector needs the support from decision

makers. It is therefore, important to ensure that public and decision makers' awareness activities are incorporated into the external support package.

## METHODOLOGY FOR THE STUDY

The present study has been conducted in Greater Visakhapatnam Municipal Corporation and Vizianagaram municipality. The researcher collected data from secondary sources i.e office records, files and reports of the municipal corporation, Visakhapatnam Municipal Corporation, Visakhapatnam and Municipal Office, Vizianagaram. The researcher also interviewed the officials dealing with the Waste Management Methods and Practices and obtained the required information, using interview guide. The data collected from the office records and the interviews with the officials has been classified and tabulated as shown in the tables at the end of the paper. It is proposed to undertake further research on this problem in the future, using the scientific methods of research.

## ANALYSIS OF DATA:

Table – 1 shows that demographic profiles of the urban areas under study. Visakhapatnam, one of the major cities in Andhra Pradesh, has a total population of 12 lakhs according to 2001 census; The current estimated population is about 20 lakhs with 4 lakhs estimated households, 72 wards and 545 sq.kms.

According to 2001 census, Vizianagaram town has a total population of 1,74,651 with 45072 households, 42 wards, covering an extent of the area of 39.90 sq.kms. Information about the current estimated population is not available in the office records.

Visakhapatnam is a city under the administration of Greater Visakhapatnam Municipal Corporation where as Vizianagaram town is under the administration of Vizianagaram Municipality. There are wide differences between the two urban areas in terms of population, households and the extent of the area. One is more developed and the other is very backward in terms of urbanization, and qualitative and quantitative growth.

Table -2 shows waste generation in the two selected urban areas. In Visakhapatnam city, solid waste generation includes 450 tons per day (domestic waste), 550-600 tons (commercial drain slit and others), 350 tons (Bio-medical waste); daily waste collection amounts to 1000 – 1050 tons; door to door collection of waste comes to 70 percent.

As revealed in the table, in Vizianagaram town, solid waste generation includes 47 tons (domestic waste), 70 tons (commercial drain slit and others); daily waste collection amounts to 117 tons; door to door collection comes to 90 percent. Information is not available about Bio-medical waste generation in Vizianagaram town.

There are differences in the two urban areas under study so far as waste generation and waste collection is concerned due to differences in the size of populations and extent of the areas.

Table – 3 reveals door to door waste collection in Visakhapatnam and Vizianagaram urban areas. In Visakhapatnam door to door waste collection covers 45000 households(70% of the total households of the city) as against 45072 households (90% of the total households) in Vizianagaram town. Comparatively Vizianagaram Municipality covered higher percentage of households as regards door to door waste collection.

Table -4 shows the number of sanitary workers and the number of vehicles engaged for sanitation and waste management in the two urban areas under study.

The Visakhapatnam Municipal Corporation engaged 5329 permanent workers and 802 contract workers and 1389 vehicles for sanitation and waste management; whereas, the Vizianagaram Municipality engaged 277 permanent workers, 275 contract workers and 185 vehicles for the above purpose.

The differences in the strength of sanitary staff and the vehicles are due to the size of the population and the extent of the urban areas and also the stage of the development of the city/town.

Table -5 analyses waste management methods and practices in the two urban areas under study. The waste management methods/practices in Visakhapatnam include transfer to the dumping ground and burying waste, thermal treatment through Marida Eco Private Agency, sewage treatment, waste reduction and reusing the treated sewage for industrial use.

The Vizianagaram Municipality adopted the methods of transfer to dumping ground, thermal treatment of Bio-medical waste through Maridi eco Private Agency. It has not adopted so far the methods of landfill, recycling of sewage water and reuse of the same for industrial purposes.

Due to small size of the town and population, lack of awareness of the staff and the public, paucity of funds, the Vizianagaram Municipality has not so far adopted the methods and practices obtaining in developed countries. Vizianagaram is a backward district of North Andhra.

Visakhapatnam is a fast growing city with increasing number of industrial units, institutions, special economic zones, business units, sea coast and other resources. It is revealed from the interviews with the officials of the Municipal Corporation and also from the office records that it has taken up the sewage scheme in a phase manner. Projects for construction of sewage treatment plants with an estimated cost of 386.10 crores sanctioned by the Government of India under Jawaharlal Nehru National Urban Renewal Mission are in progress.

In view of the analysis of the data, it may be observed that Visakhapatnam has made a beginning in waste management practices. It has not so adopted solid waste management systems. The lack of public awareness and school education about the importance of proper solid waste management for health and well-being of people severely restricts the use of community – based approaches. At dump sites, transfer stations and street refuse bins, waste pricing or scavenging activities are common scenes in developing countries. The Visakhapatnam and Vizianagaram urban areas have not implemented latest scientific waste management practices. When compared to Visakhapatnam, Vizianagaram is has not implemented scientific waste management practices such as landfill, recycling solid waste, sewage treatment, treatment of sewage water for industrial use. Developing countries have weak economic bases and, hence insufficient funds for sustainable development of solid waste management systems. The social status of solid waste management workers is generally low in both developed and developing countries.

### **STRATEGIES FOR SOCIAL WORK INTERVENTION:**

Education and awareness in the area of waste and waste management is increasingly important from a global perspective of resource management, in view of the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources. Local, regional, and global air pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of "green house" gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations.

If the objective of development is to improve 'the quality of life', then development and environment protection cannot be mutually exclusive. There is growing congestion due to unplanned development taking place in urban areas. Urban centres account for one-fourth of the country's population. Mega cities like Bombay and Calcutta have been growing haphazards without careful planning. There is rampant growth of slums. Awareness is growing to deter the kind of development which destroys the green belt and depletes ground water reserves. Development is meaningless unless it is sustainable.

Illiterate people cannot understand cause-effect relationship between pollution and ill-health, deforestation and bleeding, exclusive noise levels and hearing impairments. The common man made has more pressing problems to attend to than environmental issues including Waste Management. Environmental issues are beyond his sphere of reckoning. Even Middle class educated people who are more knowledgeable will not understand the contribution of their refrigerator to the depletion of the ozone layer, the damage done by plastic waste thrown into



irrigation canals which pollutes the water used for farming. Stagnant water blocked by plastic, fosters the growth of disease- carrying organisms.

The professional social worker plays a crucial role in educating the illiterate masses, and the public about the evil effects of environment pollution and the need for Waste Management. Our basic task is to educate ourselves in order to be able to educate others. We have to take the lead in involving ourselves in issues that concern people and be the catalysts of a movement to protest against the forces of destruction of nature and effective Waste Management.

People's participation is the most important aspect for success in one's work. Work with client system would transform them into an action system. The action system would involve the process of conscientization. Change from within is stronger than change from without. In working on issues of Environment and Waste Management, social advocacy is an invaluable method of intervention. Publicizing public issues is a sure and effective way of drawing mass attention and sympathy to one's cause. Social advocacy would also involve lobbying at various levels in order to strengthen one's base of work. Lobbying has become an integral part of social action in gaining support.

The Social Worker will have to undertake awareness programmes which include discussions, talks, audio-visuals on Waste Management problems and methods. The effort is to help the school and college students to identify their responsibility in preserving and protecting our common environment. Many school children have been motivated to hold exhibitions on environment pollution and degradation. Some schools managed to get the declaration of their schools as silent zones. Others have managed to get the garbage dumps cleared around their school. There is need for regular training workshops or environmental education and Waste Management for school teachers.

The role of college is to be aware of and assess the factors and values that shape the society. Much of this is done through research, spelling out strategies of intervention and utilization of media. Informing people about this crucial concern is not only our right but also our duty. There is pressing need for social workers to work as a team. They have to work with other professionals. Interdisciplinary functioning is the need of the hour.

## **REFERENCES**

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3. [http://en.wikipedia.org/wiki/waste Management](http://en.wikipedia.org/wiki/waste%20Management).

**ANNEXURE – 1****TABLE -1****Population in the town selected Urban Areas (Visakhapatnam and Vizianagaram)**

City/Town	Population	No.of Households	No.of Municipal Wards	Extent of City /Town
Visakhapatnam City	12 lakhs (2001) census  (Current estimated population in 20 lakhs)	21 lakhs  estimated households	72 wards	545 sq.kms
Vizianagaram Town	1,74,651 (2001) census  (Information not available about current estimated population)	45072  households	42 wards	39.90 sq.kms

TABLE - 2

**Waster Generation in Visakhapatnam and Vizianagaram**

City / Town	Domestic Waste Generation	Commercial Drain slit and others	Bio-Medical Waste Generation	Daily Waste Collection	Door to Door Waste Collection
Visakhapatnam City	450 tonnes per day	550 – 600 tonnes per day	850 kg per day	1000 tonnes to 1050 Daily	70%
Vizianagaram Town	47 tonnes	70 tonnes	Information not available	117 times	90%

**ANNEXURE - 2****TABLE – 3****Door to Door Waste Collection in Visakhapatnam and Vizianagaram**

City/Town	No.of households covered	No.of Dustbins supplied	Percentage of Waste Collection Covered
Visakhapatnam City	45,000	2 Dust bins (Red & Green) for Non- biodegradable and Bio-degradable waste collection	70%
Vizianagaram Town	45,072	Two bin system implemented in 36 wards out of 42	90

**TABLE – 4**

**Sanitary Workers and No.of Vehicles engaged for  
Sanitation and Waste Management**

City / Town	Permanent Workers	Contract Workers	No.of vehicles engaged
Visakhapatnam	5329	802	1389
Vizianagaram	277	275	185

**ANNEXURE - 3****TABLE – 5****Waste Management Methods/ Practices in Visakhapatnam and Vizianagaram**

City/Town	landfill	Incineration (Thermal Treatment)	Recycling Method (Solid)	Recycling Method Treatment Sewage Water	Waste Reduction reuse
Visakhapatnam	Being disposed to dumping ground and burying waste	Bio-medical waste (Thermal treatment) through Maridi Eco Private Agency	Not adopted so far	Sewage Treatment Plant	3.60 Million per day of treated sewage water for industrial use
Vizianagaram	Being disposed to dumping ground (Not burying waste)	Biomedical Waste Thermal Treatment through Medic-eco Private Agency	Not adopted so far	Not adopted so far	Not applicable