Promoting Environmental Sustainability and Resilience Through "Community-Based Waste Management Initiatives: An NGO-Led Case Study of Janashikshana Trust, Mudipu, Mangalore"

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INTRODUCTION

India is a critical sector for a sustainable 2025 and beyond, as the country currently generates approximately 62 million tonnes of waste annually—a figure projected to reach 165 million tonnes by 2030. Rapid urbanization, changing consumption patterns, and population growth have intensified solid waste management challenges across the globe. In India, semi-urban and rural areas face unique difficulties due to limited infrastructure, lack of awareness, and inadequate institutional support. Improper waste disposal leads to environmental degradation, health hazards, and reduced community resilience to environmental risks.

Waste- an overview at a larger picture

In the global scenario, waste production is always associated with the consumption. More and more consumption, more developed we are. The development indices are based on the consumption of products for their lifestyle to get technologically updated, deploying technology to increase the better livelihood and as well as for the modern outlook. Development indices are mainly based on consumption. Thus, more and more products are technologically developed, more developed we are and same way disproportionate amount of waste we produce back to the system, that is to the environment. More developed we are, the more waste we produce. And this is the phenomenon of present development. Any product that is produced for consumption for masses with the intention to reach to their lifestyle, more technological upgradation, to afford to better livelihood. So, we deploy technology as well as we increase the complexity in terms of waste production. Consumption versus technology, what will happen when those products reach end of life? unfortunately We do not have, the process and technology to address when these products reach to the stage of waste.

report according to a study, on an estimate of a trillion-dollar economy will increase 6 million tons of municipal solid waste annually, and another research study Stated, to get into the race of GDP. the GDP has increased 23 times, mineral extraction has gone to 27 times, fossil fuel consumption has gone to 12 times India produces 6 million tons of waste annually. India's economy is currently valued at around 4.18 trillion, making it the world's fourth-largest economy as of late 2025/early 2026, with projections to hit 7.3 trillion by 2030

We are in race of 4 to 5 trillion economy now, so we can estimate what will happen in near future in terms of the waste production. At this point, we are fighting with the situation on a waste management, as we grow bigger, we can estimate what kind of face we will encounter or we have to encounter. Think about a kind of effort that is needed to intervene in terms of waste management.

Major source of waste at an outlook

Plastics: Let us Focus to cover the three major source of waste that are adding to the landfill, the one first source is plastic. We have numerous varieties of plastics which are being used as products by consumers. We have blended plastics, we have multi-layer plastics which are of single use. So all the multi-layer plastics are the plastics where we have food products, kurkure packets, and the food item what is ordered from swiggy and Zomato and buy parcels from hotels and shops. the covers what we use for shopping. so these are the multilayer plastics where the end life care of these plastics are just to fill on the land or just to burn them. Of course, there

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are studies says that there are some minimal ways where these multilayer plastics are used for road construction, that is for the damaring process, which is only in a very minimal way.

Fabrics and clothes : The second source, in fact, major source of waste are fabrics. The consumers are in more demand towards the different varieties of fabrics because in the name of fast fashion, updation consumer demand is more. we are blessed with a profound variety of fabrics that have come limelight. the earlier or traditionally, we have three to four types of fabrics, where now we have variety of fabrics like flannel, ottoman, lawn, velvet, denim, satin, crepe, linen, viscose, rayon, polycotton, silk, and many more. So, as there is a huge consumer demand, there is huge production and supply of these fabrics. We have technologically updated fabrics which are ready for the use of consumers' demand. But unfortunately, in this sector also, we don't have any technology that is to address any intervention about the end of life care of the fabrics. We buy more and more clothes even though if we, clothes or if you do not want this, but we end up buying clothes. These clothes for four to five times. Then, it becomes outdated, it becomes fashion less, and immediately there will be a new fashion what is replaced with the clothes what we have in our wardrobe. So, unfortunately, these accumulated clothes, are then just dumped into landfills. There is no any concept of recycling or reusing or, you know, the restyling of these fabrics which are being accumulated by individuals. All are adding to the landfill.

Electronic waste: The third major source of waste which I am covering in this presentation is about electronic waste. The electronic wastes are so-called the computers, the mobile phones, and other electronic apparatus that we use in our life on a day-to-day basis. Of course, IT industry have observed boom in recent innovations where we have EV batteries and of course, the the old generation computers, the old generation mobile phones which we have used and already stored in the form of electronic waste. We do not have any technology to look into the management of these lead-acid batteries, lithium batteries. So, we can focus on our intervention, the so-called the old generation electronic items or electronic waste are already dumped into the landfill and we have not given any management or we have not given any intervention for those wastes.. We are running towards the IT development while upgrading, so there are newer challenges on our table in the global scenario, coming into the newer invention and newer technological development.

Environmental sustainability and resilience are closely interconnected. Sustainable waste management practices not only protect natural ecosystems but also enhance the capacity of communities to adapt to environmental challenges. Community-based waste management (CBWM) has emerged as an effective approach that emphasizes local participation, behavioral change, and decentralized solutions.Non-Governmental Organizations (NGOs) act as critical facilitators in this process by mobilizing communities, building capacities, and introducing appropriate technologies. This paper focuses on the NGO-led waste management initiatives of Janashikshana Trust, Mudipu, Mangalore, and examines how these interventions promote environmental sustainability and resilience through community participation.

Another yet major challenge or I would say it is an reality where in terms of the end life care of this various products , only government is accountable in terms of management waste, where the government is the only prime owner of waste management in India . There are no any private sectors which are accountable to the end life care of these products what they produce from their industries. so this is going to be a very major problem on our table as you know arising as a challenge for all of us in future in a global scenario now let us focus on what is happening in terms of waste management in a very small village called Balepuni , in Bantwal taluk of Karnataka, one which is considered to be as a waste free community or waste free village , an NGO led movement initiatives towards the community engagement or community responsibility in waste management, intervention done by an NGO called Jana Shikshana Trust Mudipu.

Conceptual Framework

a) Environmental Sustainability

Environmental sustainability refers to responsible interaction with the environment to avoid depletion or degradation of natural resources and ensure long-term ecological balance. In the context of waste management, sustainability involves waste reduction, segregation, recycling, and safe disposal practices.

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b) Environmental Resilience

Environmental resilience is the capacity of communities to withstand, adapt to, and recover from environmental stresses and risks such as pollution, flooding, and health hazards caused by improper waste disposal.

c) Community-Based Waste Management

Community-based waste management emphasizes local ownership, participation, and decentralized solutions. It includes awareness building, segregation at source, composting, recycling, and collective responsibility.

d) Role of NGOs in Community-Based Waste Management

NGOs play a vital intermediary role between communities and institutions. Their contributions include:

- Creating environmental awareness
- Mobilizing community participation
- Capacity building and skill development
- Facilitating low-cost and locally suitable technologies
- Ensuring sustainability through continuous engagement

Janashikshana Trust exemplifies this role by integrating education, community development, and environmental action.

Objectives of the Study

1. To examine the waste management initiatives undertaken by Janashikshana Trust, Mudipu.
2. To analyze the role of community participation in ensuring sustainability of these initiatives.
3. To assess the contribution of NGO-led waste management to environmental sustainability and resilience.
4. To understand the outcomes and challenges of community-based waste management practices.

METHODOLOGY

The study adopts a **case study approach**.

Sources of Data : **Primary Data:**

- Field observations
- Key informant interviews with NGO staff, volunteers, and community leaders
- Informal interactions with household members

- **Secondary Data:**

- Annual reports and records of Janashikshana Trust
- Published articles and relevant literature

Study Area

The study was conducted in Mudipu and surrounding areas of Mangalore, where Janashikshana Trust has implemented community-based waste management initiatives.

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Profile of Janashikshana Trust

Janashikshana Trust, Mudipu, is a well-established NGO engaged in adult education, community development, skill training, and environmental initiatives. The Trust works closely with local communities to address social and environmental issues through participatory approaches.

Waste Management Initiatives of Janashikshana Trust

Awareness Generation

The Trust conducts environmental awareness programs, workshops, street plays, and campaigns focusing on the importance of waste segregation, cleanliness, and environmental protection.

Segregation of Waste at Source

Households are trained to segregate biodegradable and non-biodegradable waste, promoting responsible waste handling practices.

Composting Practices

The NGO encourages household and community-level composting of organic waste, reducing dependence on external waste disposal systems.

Recycling Practices

Non-biodegradable waste is collected and linked to recycling channels, ensuring safe disposal and resource recovery.

Capacity Building

Training programs for volunteers, self-help groups, and youth enhance skills in waste management techniques and leadership.

Community Participation

Local stakeholders, volunteers, and households actively participate in planning and implementation, ensuring ownership and sustainability.

Findings and Discussion

The study reveals that:

- Waste segregation practices have significantly improved among households.
- Environmental awareness has increased, leading to behavioral change.
- Composting has reduced the volume of waste sent to dumping sites.
- Community ownership has strengthened, enhancing long-term sustainability.
- Environmental resilience has improved through reduced pollution and better preparedness against environmental risks.

NGO facilitation combined with community participation emerged as a key factor in the success of the initiatives.

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Challenges

- Initial resistance to behavioural change
- Limited financial and infrastructural resources
- Need for continuous motivation and follow-up

Despite these challenges, sustained engagement helped overcome barriers.

CONCLUSION

The case study of Janashikshana Trust demonstrates that NGO-led, community-based waste management initiatives significantly contribute to environmental sustainability and resilience. Participatory approaches, capacity building, and locally appropriate techniques empower communities to manage waste effectively and adapt to environmental challenges. The model offers valuable insights for replication in other semi-urban and rural contexts.

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