

Solid Waste Management for Sustainable Tourism

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ABSTRACT

Solid Waste Management is becoming an alarming issue and is gaining lot of attention in our country. The management of solid waste has become a problem in all metros, municipalities and even in small villages. The waste management has become a tough task along with the population explosion. Especially the solid waste management in the tourist places is a major concern because of the presence of huge number of outsiders every day. This paper is about the waste management process of six tourist sites of Kerala and Tamil Nadu, and its effectiveness in bringing sustainable tourism. In-depth interviews of key informants engaged in the solid waste management process of these areas has been administered along with observation of ongoing waste management process. The findings show that sensitization of the visitors and creating awareness on waste management using various techniques is the prime factor, followed by reducing the influx of waste especially the non-biodegradable waste and finally treating the generated waste are the major parameters to successfully tackle the problem of waste management. The cleanliness and hygiene in a tourism site is often directly proportional to the influx of tourists and to create a sustainable tourism.

Key Words : Solid Waste Management Literacy; Solid Waste Production and Collection; Solid Waste Disposal and Treatment, Sustainable Tourism

INTRODUCTION

The United Nation designated 2017 as the International Year of Sustainable Tourism. Development of Travel and Tourism creates jobs, increase exports and prosper the economy, according to the World Travel and Tourism Council. In India, Travel, and Tourism is the third largest source of foreign exchange, *i.e.*, 5.4% of our total exports. The recent statistics showed that the tourism sector had contributed 3.3% of GDP in 2016 directly which is 9.6% in case of total contribution (Turner, 2018). The sector had provided 5.8% of direct employment and 9.3% total employments. The tourism sector can be divided into two streams namely leisure tourism and business tourism. In India, 94.6% of the total tourism is running under leisure tourism (Turner, 2018) which contain Cruise tourism, adventure tourism, medical tourism, religious tourism, etc.

Leisure tourism is a kind of tourism where traveller

wanted to experience a change in climate and place and learn something new, enjoy the pleasant scenery or to know more about the culture of the destination. Tourism helps in to relieve the stresses in the day to day life, and make them refresh in the coming days. Those who are in search of all above will prefer to stay in some quiet and relaxed destinations preferably at hilltops, beaches, or islands (Forms of Tourism, 2013).

Here comes the importance of a neat and clean ambience and fresh air circulation which are the key things for leisure tourism. A proper waste management system is essential for a neat and clean ambience as it can reduce the maximum waste production and eliminate the existing waste items completely. Waste management is a serious issue in our present-day world. In India, 1.5 million-tons wastes are producing every day where 1/4th of it is getting treatment (Jadhav, 2018). Since the population has a huge effect on waste generation, it is a common phenomenon that half of the waste is produced

by our major cities. In tourist areas, a huge population will gather, stay and spend their time. These places are facing terrible waste accumulation problem which require an effective waste management system.

To tackle the issue, modern day's institutions are adopting technologically and scientifically proven strategies but, these strategies stop working when the community is not enlightened with this issue. Hindustan Times gives an example of a digital bin newly installed in our metros, later on, found a failure in some places because of the lack of cooperation from the public (Asher, 2018).

This study is moving around the solid waste issue in the tourist areas and its impact on the development of the tourism industry. For this purpose, the study went through six major tourist destinations in the Kerala and Tamil Nadu who have a successful waste management model.

Waste Management and Tourism:

Undisposed waste is a menace to our society. Waste generation is comparatively less in India when compared with developed and developing nations but the situation is getting changed because urbanization and consumerism recently got prominence in our society (Sharholly, 2009; Asnani, 2001). Many studies are conducted to find out the reasons for the increasing solid waste production. Among them, a close relationship found out between Population hike and waste management issue and which are directly proportional to each other (Patnaik and Reddy, 2010 and Sharholly, 2008). A decadal growth of urban population is clearly visible from 17.35% in 1951 to 31.2% in 2011 (Census, 2011) and it is predicting that this trend will continue in the coming years. The major reasons for this as population growth, deteriorating opportunities in the rural areas and shift of economy from agriculture sector to more paying urban occupations (Asnani, 2001). Urbanization leads to waste generation, which in turn paves way to urban environment degradation and health hazards. Rampant urbanization and lack of progress in keeping up with the resulting waste production are also major issue. This could be seen from the lack of adequate number of sanitary landfills in most cities, including the metros (Vij, 2012). Economic standards have a relation with waste production in which economic standards are inversely proportional to organic waste production the while it is directly proportional to inorganic waste production (Sharholly, 2008). Govind and Kesav conducted

a study found a positive correlation between urbanization, economic growth, and waste production and deeper social issues are emerging from the contamination.

India is facing lot of hurdles in solid waste management. The common activities involved in solid waste management are generation, storage and collection, transfer and transport, treatment and disposal of which only four activities are highlighted in Indian scenario, *i.e.*, waste generation, collection, transportation, and disposal (Akhil *et al.*, n.d). Lack of availability of data on waste production, irregular cleaning, non-availability of storage, collection, transportation and treatment systems are serious issues that we face. The practices adopted to resolve waste issue are outdated and inefficient. No attempts to infuse the latest technologies have been initiated. The municipal authorities that are responsible for the waste disposal are spending much of their budget on unproductive sanitation workers. They have also failed mobilizing and educating the citizens on the basics of handling waste and proper practices of storing it in their own ways (Asnani, 2001). Disposing municipal solid waste management in our locality without taking proper precautions is common in India. Along with improper disposal, poor collection and transportation techniques results a big problem in our many cities (Akhil *et al.*, n.d).

'Waste of a Nation', a book by Assam Deron and Robin Jeffry have identified that population growth, urbanization and consumer capitalism are hindering age-old Indian traditions of frugality and recycling. They also recognized the potential of India to overcome this issue through Kaabadi system; Frugality of older India tradition that not died out completely, "*Waste not, went not*"; and presence of a large number of population available for manual work if provided with decent remuneration. They also point that India has the capacity to collect, dismantle and repurpose materials which other countries cannot dream of.

Solid waste management cannot be achieved if the people are not participating well with the system (Asnani, 2001; Desa *et al.*, 2012; Hasan, 2011 and Sharholly, 2008). The awareness level is the prime factor to achieve this participation which can be influenced by many parameters like occupation, education, etc. (Sarker *et al.*, 2012). At the same time a study among the school teachers shows that, even though they have high awareness of waste management, they are very poor in practice the knowledge (Ifegbesan, 2011). Haritha Keralam,

an initiative by Kerala Govt. observed that the participation by the members in a responsible way is vital than the infrastructure facilities when determining the success rate of a waste management project. So, creating an awareness among the members can articulate the solid waste management as part of good habits.

Waste production is the greatest concern in the waste management process when its production decreases, the effort to treat the waste also will be lessened. Inorganic waste is the major concern in this category which can destroy the organic nature of our land and bane our eco-system (Ajith, 2014).

Life of community living near to the landfill site is dreadful, among them children are the most affected one. In India, dumping the waste to our surroundings is an age-old practice or rather a mindset of population. This mindset believes that dumping the waste into a public space can be a solution to clean an individual space but the reality is antithetical as this can deteriorate our lands (Ganeshan, 2017). Introduction of vehicles and manual picking from specifically designed collection bins was suggested in many studies but in practicality much of them were mere success and according to modernized standard of living. But the modern technologies helped to attain some major dimensions in solid waste management like waste reduction, resource conservation, employment generation, etc. (Bose and Blore, 1993). An improper recycling is the major problem of Solid Waste Management, followed by water pollution and air pollution, respectively (Mahima and Ragi, 2013).

The wastes finally come for a treatment process. For organic waste, composting techniques are the apt way. Organic treatment techniques like dye making, vermin composting and biogas production. While shredding and reusing are the best way for inorganic waste (Singh *et al.*, 2017; Samadhiya *et al.*, 2017). It is also emphasized that these techniques can provide full time employment opportunities to a part of community members (Singh *et al.*, 201).

Usage of alternatives such as Zero Waste Collection System, Open Dumping to a Common Place by the Public; Community Bin System; and Door-to-Door Collection System, Service Fee in Open Dumping are all viable options to reduce this problem (Ajith, 2014). Public-Private Partnership is considered as another successful measure to overcome many concerns in solid waste management especially in technological advancement, resource mobilization, resource utilization, working

efficiency, etc. This also helps in maintaining the ownership by the public sector and flexibility of private sector made the complete sector accountable and reliable (Chettiparambu *et al.*, 2011). Privatization can help in attaining quality services in a cost-effective manner, customer's satisfaction, improved standards in operation, higher employment opportunities (Post *et al.*, 2003).

Conceptual framework :

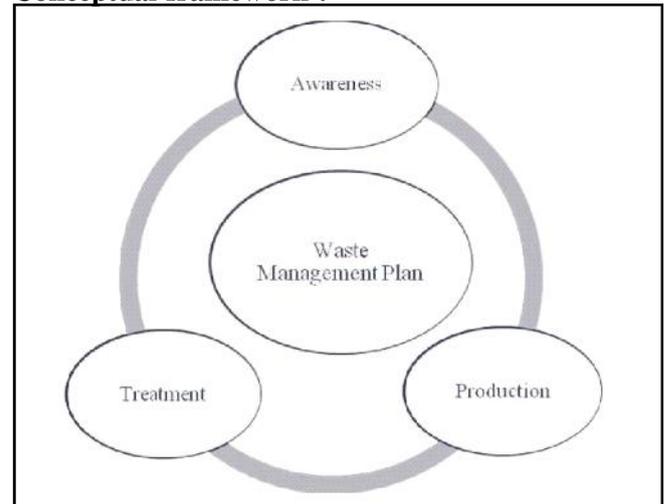


Fig. 1: Conceptual Framework of Solid Waste Management

The previous studies related to the solid waste issues helped to identify the intensity of the problem, major causes of the problems, after effects of the solid waste accumulation and also helped to identify three important variables which guides a perfect solid waste management plan, *i.e.*, waste issue awareness, waste production and collection, waste transportation and treatment.

Awareness, the first component is vital and prerequisite for the waste management. This has to be dealt with both the authorities and the visitors. The awareness part can alert the authorities on the seriousness of the issue while helps the visitors to select a responsible approach about the neatness. All the visitors may not readily accept and follow the instructions of authorities, however sensitizing them is one of the very crucial aspect and it has to be done as an ongoing process as there will be change in the visitors to the tourist place. The authorities can also collect the feedbacks from visitors and identify future areas of awareness creation.

Waste production and collection, another important component it helps to understand efforts of authorities to reduce the amount of waste coming inside. A proper

collection and disposal plan along with the reduction techniques will ensure the reduction of amount of waste generated in the tourist place. The third and final component is **Treatment**, it lies in the hand of authorities to arrange for a proper treatment mechanism. A proper treatment will ensure even the waste can be further used as resource.

Understanding the interplay between the three vital components the awareness creation, waste production and collection and treatment is very crucial for the waste management plan. A comprehensive waste management plan cannot be possible if any one of the components is missed. Therefore, a proper understanding on the role of these three components is very important to make a good waste management plan.

METHODOLOGY

‘Solid waste management for sustainable tourism’ is a descriptive study which uses qualitative approach to identify the importance of a successful waste management system in our tourist destinations to keep the area neat and clean and thereby sustain our tourism sector for the future generations. A lot of studies are going on to make our tourist locations sustainable but the importance of hygiene in these areas is yet to gain prominence. This study assumes that a proper waste management plan can ensure the neatness of our tourist locations because that can strengthen the longevity of our tourist destinations and finally make our tourism sustainable.

The researcher selected six tourist areas of Kerala and Tamil Nadu for the study. It includes three places from Kerala *i.e.* Pookodu Lake (Wayanad, Kerala), Kovalam beach (Thiruvananthapuram, Kerala), and Urban Kuttanad (Alappuzha, Kerala). The three areas identified in Tamil Nadu are Vivekananda Rock (Kanyakumari, Tamil Nadu), Kanchipuram temple and Mammalapuram heritage site (Tamil Nadu). Of these six tourist destinations, three are recreational places, one is a religious place and two are heritage places. These were purposively selected to get a comprehensive idea on waste management practices carried out in various tourist destination.

The researcher identified case study method for collecting the data. Each location considered as a separate case and tried to analyze the outcome. As part of the case study method, the researcher conducted an in-depth interview with authorities along with a structured

observation to collect the data.

RESULTS AND DISCUSSION

Characteristics of study area :

As mentioned earlier, the study selected six tourist locations from Kerala and Tamil Nadu. Out of these, three are from Kerala and three are from Tamil Nadu.

In Kerala,

1. **Pookodu Lake** : A fresh water lake located in the Western Ghats area spread in 13 acres of land in Wayanad. The biggest attraction of this area is its scenic beauty with a blue water ecosystem and evergreen canopy which is habitat for many wild creatures. The boating in the lake gives a breathtaking experience to the visitors. In 2017, more than 8 lakh tourists visited Wayanad (Research and Statistics Division, Department of Tourism) and it is a fact that Pookodu Lake is one of the main tourist spot to visit.
2. **Kovalam beach**: It is located in the southern part of Kerala which is an internationally renowned tourist destination. The main attractions of the location are sunbathing, swimming, herbal massaging, cruising, etc. Lot of international tourists are attracted to this place. It was estimated during 2017 around 2.5 million tourists have visited Trivandrum (Research and Statistics Division, Department of Tourism) as Kovalam is one of the main tourist spot, so they would have visited that place.
3. **Alappuzha Municipal Locality**: The third and final location in Kerala is the Urban Kuttandu, locally known as the ‘Venice of the East’, a geographical location below the sea level. The panoramic view of the area from the lake is the main attraction of the location. The ‘House boat’, is main attraction of the location which is a decorated house above a big cruiser in water. Half a million or more people visited Alappuzha region in 2017 (Research and Statistics Division, Department of Tourism).

In Tamil Nadu,

1. **Vivekananda Rock structure**: A tourist cum spiritual center located in the extreme southern tip of India’s mainland in Kanyakumari, Tamil Nadu. The area having a national importance because of the presence of a great spiritual

leader, Swami Vivekananda and due to its seclusive ambience and encircled position in sea. More than a million visitors are coming to the spot every year. (Vivekananda Rock Memorial, n.d.)

2. **Kanchipuram temples:** Kanchipuram is the next in order, a sacred city, commonly called as the 'Varanasi of south India' is the land of temples and silk products. It is famous for age old temples which makes the land as one among the seven sacred places of pilgrimage sites for Hindu religious people. The silk products of Kancheepuram have a great value in outside world.
3. **Mammalapuram heritage site:** Mammalapuram is the old name of present Mahabalipuram was the second capital of Pallavas after Kanchi (Kancheepuram) which is an archeological astonishment in 7th century. It consists of temples and rock structures and a beautiful beach.

The tourist areas can be divided into historical and recreational space (Two); spiritual tourist destination (Spiritual); Green tourist area (One) and one beach area. The historical spots are Mammalapuram heritage site which is a UNESCO listed one, completely handled by the Archeological Survey of India while Kancheepuram is continue as a historically important and religiously sacred place which is not only accounting for Hindu temples but for many Islamic as well as Christian temples along with the remnants of many Buddhist as well as Jain traditions. Vivekanda Rock is selected as a tourist spot because it disseminate a spiritual wave into the outside world along with the recreation, handled by an authority appointed by the Government of Tamil Nadu. Among the natural sites, the researcher selected two namely Pookodu Lake and Kuttandu location. Both are different in their topography as one is a complete tropical evergreen forest while other is a cultivated land completely out circled by water. Among them one is completely enclosed and gated territory while other is open and distributed in a wide range. The last location is a beach area famous inside as well as outside the country. The sun rays falling over the area is the specialty of the land which make it a unique to the world.

All the locations have a fortunate waste management plan to handle the waste issue but each of one are using different techniques to deal their issues

according to the local needs while they are adopting some standard techniques to deal some common issues, for example, Treatment of Produced waste. All of the six location's representatives opinioned that, without the participation of community, the system cannot win the match. The sensitization program among the visitors always keep the principal seat of a plan as which can determine the success the management of waste. Reduce the entry of the waste inside the territory is the second aspect in which authorities are barricading the walls of the tourist areas against the waste materials through different techniques. Effective measures for collection and treatment also made by the authorities to remove the entered wastes, where most of them are following some standard techniques. Finally, the successfulness of a waste management system can help the improvement of the tourism industry of our country and can manage our tourism infrastructure resource for long term, *i.e.*, from generation to generation sustainably.

Waste management awareness :

The awareness creation approach adopted by each area are different from each other. As part of awareness creation, all the tourist areas have installed some kind of information display to remember the good etiquettes in waste management, rules and regulation and penal action for its violation. All the tourist areas appointed a separate section of employees for the waste management which includes guards, supervisors, sweepers, cleaners, etc. In Pookodu Lake, Wayanadu, the duty is assigned to the Kudumbasree members. All the tourist areas have their own code of conduct for managing the waste. Each area will formulate their law in accordance with the local needs and priorities.

"We displayed instructions clearly all over the territory, many of the visitors are accepting the information not only for the time being but also to their life time" (R₆, P₆).

Kovalamarranges a beach cleaning drive in January 26th, August 15th, and October 2nd which will provide a practical experience to the visitors and community members while Vivekananda rock authorities createa spiritual as well as well moral ambience where the visitors act as a responsible citizen through their own initiatives.

"When we are organizing a beach cleaning program, you can see a huge participation from tourists as well as from community. They don't hesitate to do anything as part of cleaning" (R₂).

We don't have to put lot of effort to guide the visitors in waste management as they behave like responsible members and try to keep the area as clean space. We think that, the ambiance which is preparing them to work accordingly" (R₃, P₃).

But for Alappuzha Municipality, the area is large and spread out, creating an awareness in a systematic way is not possible. To deal with this problem, the authorities are highlighting the uniqueness of the land, the sensitivity of land towards all kinds of pollution and finally emphasis on the significance of the land to keep organized. Different awareness campaign towards the public, city labors will create a sensitization to them and ignite their responsibility sense to guide the outsiders to keep a proper management of waste.

"Most of the visitors are become flabbergast while they came to know the uniqueness of Alappuzha and commit themselves to keep the area neat and clean" (R₄, P₄).

In Mammalapuram, through strict rules and regulations, the authorities try to guide the visitors in a responsible way. But its impact is not found effective as the instruction act as an external factor and no insight done.

Waste production :

The reduction in the waste material can be achieved by reducing its production and usage. Reduction in production is not an easy task when the society is already stabilized with the usage of many such products. Changing the products for the sake of our environment is not acceptable to many. The problem becomes critical when we don't have a successful alternative to that products. Tourist locations are receiving a lot of people from different lifestyles using different products. Entry and accumulation of waste is the major waste production in these areas. Controlling the waste accumulation inside the major concern of the location.

The Pookodu Lake try to sensitize the visitors to reduce the waste production by giving a reward for their effort where they are using a labeling technique for plastic products. But this is antagonizing the Kovalam idea as they are appointed some external agents to clean the area. Here, the authorities appointed employees for the cleaning purpose. This idea is will not create any responsibility for the visitors while this generates some employment opportunities.

"When we implemented the labelling scheme, we

got a huge participation from community as they identified that it makes some benefit to them" (R₁, P₁).

The production reduction technique of Vivekananda rock is not a screening mechanism but a responsible usage mechanism. Through this, they are authorizing the people to manage the waste in a responsible way while Alappuzha has a different story. They are trying to reduce the waste by strict implementation of rules. For them,

"We have no option like any other tourist spot to screen or guide the visitors on waste usage. So we are making a deterrence over irresponsible waste usage" (R₄, P₄).

Kancheepuram temple is completely banning the entry of waste items and by this way, they are keeping the area neat and clean. The condition of Mammalapuram is not different as they are also preventing the entry of waste.

Making some screening mechanism is an administratively easy mechanism with an ample output but it neither creates any responsibility for the citizen nor follow the rules willingly but only do this because of avoiding the penal actions.

Waste treatment :

The treatment is the duty of the administrative authorities. All the tourist areas have some kind of solution for managing the organic wastes while no facility over non-biodegradable items. For managing the organic wastes, some kind of treatment mechanism is there like composting pits or biogas plants while all the tourist areas are depending on outside agencies for processing the non-biodegradable wastes which are collected and segregated and will send to these outside agencies or they will collect the items from agencies. The workers will collect the wastes in the evening and accumulate and will segregate in the next morning.

In Kovalam, a Kovalam Resource Recovery Program, where the organic wastes are converting into fuel with a slogan of "Food to Fuel". Majority of the waste converting into biogas, an alternative to the cooking gas and transmitted to the local communities in cheap rates. At the same time non-biodegradable wastes, Resource Recovery park which segregates according to its reusable, recyclable, repairable possibilities.

"We have no hesitation over the waste accumulation problem especially on organic products as we have a successful solution for us; Food to Fuel"(R₂, P₂).

Vivekananda Rock, Alappuzha Municipal

Corporation and Kancheepuram temple are using almost the same strategies for treatment mechanism. All of them have a composting technique in their own premises for managing the organic wastes while they all are out sourcing the inorganic wastes to outside agencies. Among them, Alappuzha has the strongest system with good transportation facilities and composting plants.

Conclusion :

The study analysed the importance of a solid waste management system in a tourist location. To get an overall picture, the researcher went to some tourist destinations who have a successful model to deal the solid waste management issue through waste literacy creation, effective waste production and collection, and effective disposal and treatment system.

As part of awareness creation, all the tourist areas are doing great jobs by displaying different information, sensitizing the visitors through different activity and finally making them a responsible citizen by creating an empathetic feeling over the waste issue. The production and collection by banning the entry of waste as much as possible. If at all allowing, prompt them to carry back all the items they carry in. In disposal and collection, different practices for organic and inorganic waste. All most all the location have some kind of treatment plant for composting or biogas production, through which the organic wastes are processing while inorganic items are sent out to the outside world for scientific treatment.

The rate of successfulness in managing the solid waste in different tourist area clearly shows it as a vital role in effective tourism industry. The different sites provided different insights to the researcher for managing the waste issues. A creative awareness program can solve the waste management issue very effectively as it will create a literacy over visitors for act responsibly. When the sites are neat and clean, the visitors feel to visit the place again and again. It can say that the neatness of a site is directly proportional to the influx of the visitors and improvement of the tourist site.

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