ZERO WASTE KOVALAM

AND

EMPLOYMENT OPPORTUNITIES

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THANAL CONSERVATION ACTION AND INFORMATION NETWORK

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Sridhar R

Shibu K Nair
CHAPTER 1
INTRODUCTION TO THE STUDY

The Zero Waste Kovalam Project is an ongoing program of Thanal, a voluntary public interest research, action and advocacy group based in Thiruvananthapuram, Kerala. This project is a multi-stakeholder program jointly supported by the Department of Tourism, Kerala, KHRA (Kerala Hotels and Restaurants Association) - Kovalam Unit, Greenpeace, GAIA (Global Alliance for Incineration Alternatives), and the Grama Panchayaths of Venganoor and Vizhinjam. The Zero Waste Kovalam Project aims to tackle the waste issue in the fishing village and beach destination of Kovalam through the invigorating process of Zero Waste that is changing the way communities use materials and resources. Zero Waste is an ethical, economical, and efficient way of looking at material use and in the process eliminating the production of waste and the need for waste management.

An important component of the Zero Waste programme is to explore sustainable employment options as a way of developing a sustainable society and use resources and skills to develop sustainable employment for the local community. This also means a paradigm shift from the top-down, grant based, employment generation (and/or poverty alleviation programmes) and the linear waste management methods that Governments are implementing that is leading to more and more resource depletion and more and more families to compete in this rather unjust system. In Zero Waste Kovalam, discards management methods specifically aim at complete resource recovery, eliminating the use of materials that cannot be safely recovered and promote materials that are locally available, producable and recoverable. Materials Substitution is one of the components that aim at local families producing these materials that can substitute toxics use like plastics and chemical contaminated food and water and thus aim for not only a healthy resource use but develop local employment and local economic growth.

This research project aims at studying the employment generating activities in the area, vis-a-vis the condition that was prevailing in the area and to document the process, change and results. It aims to determine and develop the Local-level employment opportunities opened up by the implementation of the Zero Waste Kovalam programme in Venganoor and Vizhinjam Panchayaths. An analysis of the process is also attempted. A look at some of the major issues that pose challenges for implementing the Zero waste concept especially with respect to employment generation, resource use (especially the life-supporting systems like land, water) and materials substitution is attempted.

1.1 BACKGROUND TO TAKING UP SUCH A STUDY

Waste has always been seen as the dirty and dark side of society and the garbage bin in every home or institution has always occupied the most unwanted and sometimes uncared off corner. The rather negative priority that we have given to garbage in our lives have finally led us to take it as a more than serious pre-occupation thanks to issues that have plagued waste generation and management in our homes, towns and cities in our State.

Waste in the State of Kerala is not an old story. It is only since the last two decades or so that we have faced the stinky problem of waste in the dimensions that we currently experience. What exactly are these dimensions and why have we come down to this state of affairs after being flaunted around in the development circles across the globe as one of the most progressive, hygienic, health-prioritized state – one of this kind in the country and comparable only to a very few European nations?

Before asking questions let us turn around a bit and look at our traditions. There was very little place for the word “waste”. “Waste” was something that came last, when nothing else could be done, something, which we finally discarded. Those were times when there were too little resources, in whatever form, and one could not discard anything. So, whatever was produced, was used to the
maximum, and hence there was no place for “waste” in the society. Disposal of discards, mostly organic was done in pits and crude form of latrines and nature did the rest of the job. Waste in the towns and cities in Kerala before 1960's comprised mostly of organic matter and almost the whole quantity of waste seems to have been recycled back into nature by composting or direct use as manure. In Thiruvananthapuram, farmers used to pay the municipality workers to get them the best quality market waste, directly, and tons of waste used to leave the city into farms and fields, and even to Tamilnadu, as manure, without even being composted in the dumping yards. This was the experience almost all over the State. But later on, the content of the waste gradually underwent a change. Inorganic material, mostly in the form of plastics – mainly the consumables and disposable items - entered the waste stream. And as less and less of waste was recycled or composted, the composting yards gradually became just dumping yards. This experience is very similar in all the municipalities and corporations. In Kerala, panchayaths, which till then had no problem of managing the discarded matter, also started facing the same issue as in municipalities and corporations.

During these two decades, Kerala also saw development of its infrastructure, which meant that with money pouring in from the Gulf and investments increasing in the construction sector, in housing and in tourism, building up the landscape became a major preoccupation. It changed the landscape drastically, filled up paddy lands, pulled down hills, closed the seacoast and stone-walled the river sides, mined the rivers and it left a lot of debris behind which tainted the surroundings. Consumerist tendencies appeared, and people moved more into lifestyles that were at par with the west. Packaging of items, sudden spurt in throw away (disposable plastic) packing and covers came to stay. People also forgot past cultural practices and started mindlessly throwing away the waste into any street corners, roadsides, drains, wetlands, fields and even wells. And these dumping grounds became unsightly and unhygienic places, breeding sites for disease causing germs and vermin. Ground water contamination became a major issue in all the communities surrounding these dumping yards, wetlands and wells.

Any management systems that was in place was totally ill-equipped to handle this change. Waste removal almost fully failed and most of the Local Governments handled the situation by just collecting the waste and dumping in some other place, till there were objections from there – some sort of shifting operation. Open burning of waste, littered streets, roadsides with heaps of rotting and stinking waste, over laden waste bins, stray dogs pulling and fighting over these heaps became very common sights.

During these times Local Self Government Bodies (LSGB’s- Panchayaths, Municipalities and Corporations ) were also attempting whatever waste management they could apart from the unhygienic land filling and dumping practices. Incinerators were proposed in many Panchayaths and Municipalities in the late 1990’s. At many of these places companies that sell incinerators went on a marketing spree and enquiries started pouring in at the Panchayath, Local Administration and Pollution Control offices. Many Panchayaths started installation of Incinerators.

It was almost at the same time that in the global scene, countries across the world had come together to negotiate a treaty for eliminating the production of Persistent Organic Pollutants (POPs), consisting of chemicals that were persistent in the environment, meaning that they will not biodegrade easily, and may bio-accumulate and even bio-magnify as we move up the food chain. These chemicals were organic chemicals and were pollutants with extremely dangerous properties of toxicity. The Inter-governmental Negotiating Conferences that were being organised by the United Nations Environmental Programme (UNEP) identified 12 POPs chemicals and their sources for immediate action of phasing out or elimination. Dioxins and Furans, two of the chemicals that were unintended by-products of many anthropogenic activities were also targets of phase out. Apart from many industrial manufacturing processes using chlorine like pulp and paper industries, steel industries, cement-kilns using hazardous waste for firing, etc Incinerators- municipal waste, bio-medical waste and hazardous waste - were found to be major contributors of these extremely hazardous chemicals. The famous case of the Love Canal and the consequent book “Dying from Dioxins” by Loise Marie Gibbs gave the siren for the fight against these chemicals that could irreversibly harm human and other animal species.

In India, the International Platform for Elimination of Persistent Organic Pollutants (IPEN), a larger global network of concerned citizens and groups all over the world, brought news of these activities in the global scene. This was done with the specific intention to stop the proliferation of these technologies
into this part of the world, which in fact was happening on a large scale in the 1990’s. The Central Government’s Environmental and Forests Ministry represented by its Secretary was party to these POPs treaty negotiations but were keeping a silence over these activities. IPEN in 1998 organised a conference to alert groups and NGO’s about the possibility of these technologies being dumped and also about other POPs chemicals, most of them being organochlorine pesticides used extensively in the country.

In 1999, Thanal, a voluntary research and action network based in Thiruvananthapuram, and working on issues related to the environment started researching on the sources of POPs – pesticides and waste in particular in the State. The understanding then was that there was no fear of incinerators in the State, as these were costly technologies and municipalities with the relatively smaller quantities of waste could ill-afford to use them. But the search led to some startling finds. Many Incinerator companies had already established office in the State and many had sold Incinerators to hospitals, panchayaths and other institutions. These were not exactly the multi-national companies, but were enterprises that either transferred or adapted a foreign technology or had developed their own technology. But the danger was already there and looming large. Many multi-national companies were also attempting to start office in this region. It was found that one company had already installed incinerators in about 50 places and had orders for 25 more.

Parallel to these events, there was also an on-going debate about the use of plastics, especially the disposable cover and plastics bags, which were wrecking havoc on the waste management systems of the Local Self-Governments. The Kerala State Pollution Control Board and the State Committee for Science, Technology and Environment were advocating control in use of plastics and burning of them as a way of disposal. As one of the publicity pamphlets brought out by both these organisations stated that burning of plastics would only produce water and carbon-dioxide. The pamphlets, possibly guided by materials supplied by the Plastics manufacturing industry claimed that burning of plastics did not produce toxics as feared. This rather highly unscientific and dangerous proposition was challenged publicly by NGO’s including Thanal. Scientists like Pat Costner, working with Greenpeace travelled down to Thiruvananthapuram and had extensive interactions with many scientists and public officials and brought evidence that even controlled burning of plastics contaminated with chlorine would produce dioxins, even if burnt in well-designed and pollution controlled incinerators. While it was acknowledged by all that plastic use was a menace, the Government and many scientists refused to act on the same, leaving the State today in a more that messy situation in managing its discards.

In 1999, the Department of Tourism of the Government of Kerala ordered for purchase of incinerators for all its major tourist destinations. Incinerators were proposed at Kovalam, Sanghumugham, Veli and Ponmudi and there were plans for the same in other destinations in the State. There were local protests from Kovalam against this plant. Greenpeace, an International NGO and Equations, a Bangalore based Tourism Research organisation joined Thanal and launched a campaign against Incinerators. They warned the Department of Tourism that this was a dangerous move that would eventually harm the local population and environment and in the process affect the tourism in the area.

The Director of Tourism, Dr Venu then called a meeting of these groups and had a discussion on the effects of Incinerators. He was convinced. In July 2000, the Incinerator proposal was shelved. By then, the campaign against incineration in the State had reached a more serious dimension and many panchayaths also came to know about the problems either through the media, campaign materials or by experience. Most of the Incinerators were costly systems and could not be run for long, as they had repeated operating failures. The cost of replacements and repairs were also large. For example, a 100 kg waste/hour electrically run incinerator was priced at about Rs 10-20 lakhs. Its burning coil or sometimes chamber linings did not work for more that 1000 hours. This means they had to be replaced every 1 year (considering if they were to burn 3 hours every day for 1 year, i.e. burning 300 kg / day for an year). The coil replacement cost was about 25-60% of the equipment cost and added were the various maintenance costs. So, most systems did not work for more than an year. Added to these was the huge environmental burden that Incinerators were causing.

It can be said that the Zero Waste Kovalam project owes its starting to the question that Dr. Venu raised then, “Now what are you going to do about the waste in Kovalam?” Thanal and Greenpeace
found that it was not enough that they fight issues but also propose and help implement solutions. Nityanand Jayaraman, the then campaigner with Greenpeace also added that “This attempt to solve the waste issue was also to convince ourselves that a solution we are at present talking about is actually possible”.

Thus started the search towards a solution. Dumping of waste and technology from the developed countries into Asia had led to the formation of an Asian alliance supported by many groups working in the Asian countries against toxic trade and hazardous technology trade. This formation was called the Waste Not Asia (WNA). Thanal participated in the WNA groupings and it was decided that they need to work towards solutions. Zero Waste, a concept rooted on the Asian tradition of ethical, economical and efficient resource use was mooted as a way forward for discards management in the world. Many American, Australian and Asian countries were attempting to make cities and towns Zero waste. It was decided that the WNA would help the work in Kovalam and Thanal decided to take up the process of making Kovalam – the Fishing Village and International Tourist Destination a Zero Waste Destination.

Thanal then started a series of discussions especially with the hotels in the area, Tourism department and other stake holders including the Vizhinjam Panchayath members and officials. In February 2001 a preliminary survey was started to quantify and characterize the waste generated at Kovalam tourist destination. Detailed interactions with various stakeholders were also done and these discussions revealed a detailed picture of the developmental and socio-political situation in the area. With this primary data on waste and its components, and with the support of Kerala Hotel and Restaurant Association (KHRA) of Kovalam, Department of Tourism Kerala and Greenpeace a skill share “Towards Zero Waste Kovalam...” was organised in November 2001. Experts from India and abroad shared their experiences with Govt. officials, waste managers and environmentalists from Kerala and public from Kovalam. The stakeholders at Kovalam were represented by traders, hoteliers, women’s Self-Help Groups, Panchayath members, political parties, scrap merchants etc. All the stakeholders approved of the Zero waste initiative and joined in the process. The biodegradable waste assessed to about 6 tonnes/day mostly from hotels and restaurants had to be used for bio-gas generation and it was decided that all the stake holders should work towards eliminating the plastic waste, mostly constituting mineral water bottles, carry bags, packaging and disposable cups. It was decided that ecologically sustainable and locally available alternatives like products from waste cloths, paper, bamboo, coconut etc would have to be locally produced and they have to substitute the disposable and other plastic use.

In the two years of work in the area, Zero Waste Kovalam has opened up a number of opportunities in the Kovalam village and surrounding panchayaths. The benefit of tourism development has not trickled down to the panchayaths and this programme has suddenly rejuvenated the interest among the women groups in these panchayaths. The traditional cottage and craft sector– mostly coir, handloom, screw pine etc were facing a crash especially due to marketing problems, product diversification and quality problems as well as due to heavy competition from the synthetic and plastic products. Product diversification, Niche marketing and sustainable product markets are some of the ways that Zero Waste could rejuvenate these dying industries. The following sectors were initially identified for development – bamboo, used and discarded cloths, paper bags and coconut shell products. Women groups have been very enthusiastically participating in the training programmes. A clear change in the way society sees employment is also intended by the Zero Waste Kovalam programme.

1.2 OBJECTIVES OF THE STUDY

The study was proposed in 2002 and envisaged as a two-year study but due to reasons beyond the control of the proponents of the study, the actual support for the work started in March 2003 and it had to be restricted to one year. Hence, it was decided that broadly the study would achieve the following objectives, but with the focus of documenting and helping develop the employment opportunity and better resource use in the area. Even during the project, the proponents had to change many of its objectives as this was a study of an ongoing project and the researchers were part of the project. Hence this was an action research. Subject to the reviews during the project, the objectives have been modified and the following was set to be achieved in this project.
1. To study the status of employment in the areas surrounding the Kovalam Destination, and analyse the possibilities of the Zero Waste intervention.

2. To conduct baseline assessment on the materials use in the Tourist Village of Kovalam and its direct/indirect impact on the waste stream, and analyse the impact of the Zero Waste Kovalam interventions.

3. To assess the markets for the locally produced, ecologically sustainable materials developed as part of the project and analyse the scope of the same and develop strategies.

4. To assess the potential for resource recovery through reuse/recycle for non-biodegradable discards and composting / biogasification for the degradable discards and the employment opportunity thereby provided.

5. To study the secondary materials trade in the City and to find ways of strengthening and streamlining the same as well as to develop an action plan for Resource Recovery and through this providing new employment opportunity.

6. To study the performance of the production units started as part of the ZWK project and to analyse them in the context of sustainability.

7. To determine the water use in the Kovalam Tourist area and to assess the impact of the pollution in the water bodies.

8. To document the work under the Zero Waste Kovalam project and also to provide necessary support in terms of materials study as well as engineering and research inputs.

1.3 APPROACH AND METHODOLOGY USED

This project is an action research project. ZWK is an ongoing programme and this project stems from the need to supplement its various research needs, especially those related to resource use and development of employment generating activities that are sustainable and uses local eco-friendly materials as well as discards reuse or recycle.

Primarily, the project started with a detailed secondary data collection and study. Literature related to Zero Waste, Kovalam and Tourism development were studied in detail. Much information on the employment status in the State as well as in the study area were collected. Some of the Government initiated studies like the Kovalam Master Plan, Statistics collected by the State Planning Board and the Tourism Department, Secondary data and Literature made available from Voluntary Organization such as Equations who has done excellent work on Tourism and other research organization studies have been collected. Kerala Hotels and Restaurants Association provided details of the List of Hotels and their status. Panchayath Development Reports – 1997 and 2002 were the only sources for knowing the employment status. Direct interviews and detailed discussions were conducted with about 75 SHG’s in the area to assess their performance and know in detail about the Poverty Alleviation Programme of the Kudumbasree.

Sample Surveys were conducted in two wards surrounding the Kovalam Tourist Area primarily to assess their living conditions and their interaction with the Tourist destination specifically for employment. A detailed study of the performance of the Resource Recovery facilities and its employment and resource recovery potential was also done. Similarly a detailed assessment of two units started as part of the project was also studied. A Survey of the facilities in Trivandrum and Kovalam regarding secondary markets, waste pickers and the recycling facilities was conducted. A Pilot survey of the Handloom Sector to assess its status, especially in the light of impact of globalisation and policy changes were done, but enough data for analysing the same could not be collected.
The Researchers were also involved in supporting the research and documentation needs of the ZWK project, by ways of Photo Documentation, Written documentation of all programs as reports of events and day to day activities, Media documentation, Producing public reading literature and poster exhibitions of the Coconut Shell and Paper products with support of professional artists. Necessary technical support in terms of needs assessment, quantification of the discards input, the quantification of the output in terms of gas and manure and also for ensuring the smooth functioning of the Biogas plants by way of periodical checks and quality controls were also given by the researchers. The survey done of the recycling facilities and the secondary markets was very useful in finding markets for the discards collected at the RRP. The work of the researchers have helped in developing and starting the Zero Waste Centre. The Research Team has been generally supporting the activities of the Zero Waste Centre, especially through its materials identification, interactions with the SHG’s and also its continuous interactions with the Panchayath members and officials. The research team has been able to support the training programmes by periodical interactions with the community groups. Classes have been held at the IHMCT to effect proper running of the Resource Recovery Facility. Classes have also been conducted at various SHG’s, Panchayath and Schools in the region. These sessions have helped understand the needs of the community and also in devising future strategy. The Research also involved exploring for newer materials such as Pulp making from used paper process and machine, Organic Dye etc. This research also involved studying the politics of issues that have propped up during the study and its documentation.
CHAPTER 2

ZERO WASTE

If not this way, how?
If not now, when?
(Primo Levi)

2.1 BACKGROUND ON ZERO WASTE

Waste as a Motivation: Waste is one contentious issue that has been bothering the world for too long a time. Waste is being considered all over the world as a menace – and there has been too many attempts to solve the issue. Earlier open-dumping and open-burning of waste was followed. Later sophistication of these crude methods led to technological disposal solutions namely, landfills and incineration. These technologies have not helped solve the problem because most of these are highly wasteful (and costly) processes, destroys resources and do not address the inefficiency underlying the society. Moreover, these technologies have also proved to be hazardous, emitting toxic solid, liquid and gaseous compounds that contaminate the land, soil, water and other living bodies including human beings. The inefficiency to tackle the waste issue can be directly attributed to the wrong and unsustainable material use like plastics, bad and inefficient designs, increasing resource use, especially of non-replenishable type, and thoughtless unethical practices of human society.

In the modern world a material is seen to end up as a waste after use. But, this is not a natural phenomenon. It is an unnecessary and unnatural happening. The best example of such waste is the many plastic materials that end up in the waste streams, polluting the biodegradable part of the waste, which could otherwise have been converted to manure, thus complying with the natural organic recycling process. Thus the issue of “Waste” and the toxic legacy that we have inherited through unethical, inefficient and uneconomical human life styles is the main motivation behind the attempt to revitalize the society through Zero Waste and the attempt to revive eco-friendly and sustainable materials for the future.

Zero Waste: Zero Waste is a new way of looking at our waste stream. Instead of seeing used materials as garbage in need of disposal, discards are seen as valuable resources. And Zero Waste does not stop at that. Zero Waste is a new way one looks at resources - one of the most profound ways that modern societal change is being envisaged in the world today. It is a total systems approach that goes beyond just segregate-reuse-reduce-recycling. It questions the view, of nature as an endless source of materials and an endless dumping ground for waste. Many communities all over the world, most of them victims of some form of conventional waste disposal plants like landfills or incinerators, started thinking in the lines of going out of the very paradigm of disposal, to something that is beyond even resource recovery. The three basic drivers of change that motivated such a movement was

a) the basic concern about the hazards of waste disposal.

b) broader and globally recognized environmental concerns such as the depletion of the ozone layer.

c) economic opportunities created by new regulations and techno-innovations that resource recovery and better materials management offered.¹

Fuelled by these drivers of change, waste ceased to become a cost and economic drain on productive resources; rather it became a source of innovation. And communities learnt that revitalizing the economy could very well start in the household dustbin. It was realized that whatever resources was being used, finally became discarded. But these discards also had value, and recovering and adding value to that was an economic activity in itself.

¹ Robin Murray, Creating Wealth from Waste, Demos and Ecologika publication, 1999
Zero Waste is hence seen as a new way of looking at our waste stream. It aspires not only to eliminate waste, but also to eliminate inefficiency by way of total recovery of resources, from whatever is discarded. Progressive waste management schemes typically recommend segregation of waste at source, recycling, reuse and reduction of wastes, but zero waste goads us to go beyond that. In its best form, it provides guidance on what materials are permissible in society, how they should be designed, and how materials should be handled after their use. It encompasses a “cradle to grave” approach or a “life cycle” approach for material design, production, use and disposal. So the focus shifts from “managing waste” to “eliminating waste” and “managing resources”. Two factors recognized in this regime of materials use is that

1. Even in a system with a very high percentage of recycling done the resource use – both in terms of energy and materials could still be inefficient.

2. Many products today are not designed to be efficiently used and then reused, repaired or recycled.

When producing and using products there are some basic tenets that one needs to adhere to zero the impacts on the environment and health and to move towards a zero waste society.

1. Necessity: Is the product necessary?

2. Environmental Impact: Can it be made from materials that minimize negative environmental effects?

3. Conservation: Can it be designed to reduce the resources required?

4. Safety: Can it be designed to reduce the toxics used and produced?

5. Transportation/Packaging: Can it be safely transported and marketed with minimal packaging?

6. Post-use Recovery: Can it be reused, recycled, or composted safely and easily when the use is complete?

This kind of analysis forms part of the “life-cycle” assessment of products. It is also a fundamental step needed for ensuring sustainability in industrial processes, production and consumption. ‘Zero Waste’ represents such a planning. It defines the discipline required to create a more sustainable interaction with our natural world, including the principles of conserving resources, minimizing pollution, maximizing employment opportunities, and providing the greatest degree of local economic self-reliance. ‘Zero Waste’ is hence a “logical planning approach incorporating principles of effective human and material resource utilization to avoid the conversion of discards into waste – an inefficient form – in a manner that revitalizes the local economy.”

The positive offshoot of such an approach is many. Most importantly, the zero waste approach ensures sustainability in its fully realized form as our children and other life forms that share our planet are not deprived of valuable natural resources necessary for their living.

Shifting to a New Paradigm: The shift to a Zero Waste system is primarily fuelled by the understanding that “garbage” or “waste” is an unnecessary evil, produced because a community or a society renders its resources useless by failing to properly utilise it or handle it when it becomes worthy of discarding. This inefficiency in turn sets up a system that promotes more and more resource extraction. This is the direct result of our demand driven, linear economy, where extraction, production and disposal do not replenish the system. Instead, the earth is depleted of its resources on one side and waste is

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2 Zero Waste Alliance – www.zerowaste.org
accumulated on the other. In the intermediate processes of production and consumption, pollution is a by-product. Zero Waste visualizes our economy as a circular or spiral system in which every part supports and affects every other.

Inherent in the Zero Waste approach is an emphasis on

a) Improving a community’s self-sufficiency for resources and resource management.

b) Systems that ensure that natural resources are not modified to forms (such as PVC) that degrade nature or poison life.

c) Respecting and following the nature’s cyclical flow of resources - natural resources to useful products to resource reincarnation.

d) Simplicity, Utility and Aesthetics.

Implementing Zero Waste: ‘Zero Waste’ is a generational challenge and therefore the goal in total is realized gradually. At first, the campaign may seem impossible, but slowly will move ahead once it becomes a powerful people-lead environmental initiative and mobilization of communities to action. The following policies and actions are considered desirable to move towards Zero Waste.

Producer Responsibility (or Extended Producer Responsibility). Waste management is a function that is dumped on the community and creates further irresponsibility in them as well and most of the time the cost is entirely borne by the taxpayers and local governments. Manufacturers and producers must share responsibility for recovering their products and ensuring that they are recycled and not wasted. Manufactures must also follow the Minimum-Content Standards and help close the resource use loop by using the materials collected in local recycling programs to manufacture new products. The state can support such initiatives by ensuring processes such as Consumer Deposit Programs and enact regulations such as Bottle Bill, Buy Back Incentives etc that are strategies to promote reuse and recycling.

Full-Cost Accounting and Life-Cycle Analysis. The benefits of waste prevention and recycling should include a full accounting of the costs of resource depletion, remediation and environmental degradation caused by the continued reliance on virgin materials and wasting. Further to this the State should also Stop Subsidies for industries encouraging the Extraction of Virgin Resources.

End Cheap Waste Disposal. The State must legislate to eliminate cheap and resource-destroying systems such as Landfills and Incinerators. The thrust must surely be for resource recovery.

Invest in Jobs through Reuse and Recycling. Waste prevention, sustainable materials production and recycling provides a huge opportunity to create jobs and initiate new local level enterprises that support local economic development.

Tax Shifting. Instead of giving incentives for wasting, we should give tax credits and economic incentives for reducing waste and utilizing recovered materials.

Take consumer Action against Wasteful Corporations. Much of the resistance to changing resource policies comes from industries that profit from wasting. The public must put pressure directly on corporations that profit from waste.

Barriers to Zero Waste: Zero Waste presents compelling environmental, economic, and social goals that need to be achieved. But achieving Zero Waste requires an enlightened public willing to question conventional wisdom and practice. Many Zero Waste implementing communities have identified these barriers in the long run.

- Government subsidies favouring resource extraction (mining, logging, etc) and
resource wasting (landfilling and disposal) by way of tax holidays, preferential pricing for energy and water, and other subsidies giving wasting and increased resource extraction an unfair and unnatural competitive advantage. The case of the petro-chemical industry in India is a good example.

- The high cost of waste is hidden - consumers may pay many times the cost of the product: apart from the product cost, the huge advertisement costs, the packaging and cosmetic costs, cost of disposal, and yet another cost to remedy environmental problems. But they may not have paid the real environmental and resource costs that was subsidized.

- Producers need to be responsible for life cycle of their products - manufacturers decide how a product is made and marketed yet they have no responsibility for disposing or recycling these products.

- Long term planning needs more powerful and sensible decision-makers - current systems for making policies often favor “fast results” when elected officials or business leaders feel they have more to gain before the next election or review. The long-term interests of the society should be made known to them through public pressure, votes and purchase choices.

Information and education are the keys to overcoming these barriers. Zero Waste can be build only if the Governments and Business come together with civil society initiatives.

2.2 CARDINAL PRINCIPLES OF ZERO WASTE

The principles of Zero Waste are based on ethics, economy and efficiency and that is how the problems of waste and its solutions are to be seen in the context of modernization, and rapid urbanization as well.

Fundamentally Zero Waste requires

- preventing rather than managing waste.

- turning discarded resources into jobs instead of garbage.

- supporting an economy that provides for a comfortable society without robbing the future.

- emulating natural systems where everything that wears out or dies becomes food or shelter, however temporarily, for something else, giving rise to a vibrant yet efficient flow of energy and resources.

The following key elements form the backbone of a Zero Waste policy framework

1. **Investing in community based infrastructure** for their empowerment and not invest in end-of-pipe solutions like landfills or incinerators. Community Waste Reduction and Recovery Systems such as Resource Recovery Parks stimulate innovation and create incentives for local entrepreneurs to process clean reusables, recyclables, and compostables.

2. **Creating Jobs and Sustainable Communities** to help local economies become more self-sufficient and create opportunities for civic participation and sustainable employment.

3. **Redesign Products and Packaging** for Durability, Reuse, Recyclability and safe.
4. **Extend Producers’ Responsibility** for their products at the end of useful life, creating the incentive to design cleaner, durable and recyclable products.

5. **End Virgin Resource Subsidies** at every level so that resource-conserving enterprises can use their inherent advantages to out-compete resource-wasting industries.

6. **Recognising and following Nature’s cyclic system** of material use, hence returning the organic nutrients from bio-degradable waste back to the soil and recycling the rest to the industrial processes.

7. **“True Cost” Accounting** – Since the price of a product does not fully reflect the cost, especially of environmental degradation and public health impacts associated with the virgin resource extraction, processing, manufacture, transportation and disposal of the product. Such externalities, including subsidies should be internalized.

8. **Ensuring Community participation** and responsibility in planning, executing and decision making.

2.3 **ZERO WASTE EXPERIENCES ACROSS THE GLOBE**

Many countries, states and businesses across the world have already recognized zero waste as the way forward. Communities and businesses are starting to change the way they operate and are using Zero Waste strategies to guide their future.

The entire concept was still in its bare infancy when Canberra, the capital of Australia, in 1996 adopted the Zero Waste strategy and the goal was that by 2010 no waste would go into a landfill. Today they are well within this path towards zero waste. The government owns the entire infrastructure in Canberra and all they do is franchise these facilities to the various industrial interests to use these resources. All that these enterprises need to do is to reuse projects or to take them out as material resources for recycling or for composting.

It was from Canberra that the idea spread to New Zealand. The Zero Waste New Zealand Trust has a majority of their local authorities already pledged to reduce Waste to Zero by 2020 as part of a joint National Pilot Project. Here 38% of the 74 municipalities is expected to achieve the goal of Zero Waste by 2015. In this process, the New Zealand Zero Waste Trust provides a grant and the essential blue print of the project has to be developed within the local community-their officials, engineers, and managers. An estimated 40,000 jobs is expected to be created over this period with the conversion of local discards transfer centres into resource recovery centers and by the predicted spurt of reuse and recycling businesses all over. The idea has found eager emulators in other continents as well. South California Edison in Los Angels, Del Norte County and San Luis Obispo County in California, the City of Santa Cruz are some of them pursuing zero waste visions. Halifax, Nova Scotia is one such model community which has achieved 65% waste diversion from landfills in 2000, in part by banning certain wastes from landfills. San Jose, CA is another of the model communities that recycles or reuses 60% of household waste and diverts almost 50% of all municipal waste from landfills, in part by offering financial incentives to business to reduce waste. Toronto (the largest city in Canada) has also formally declared to achieve Zero Waste by 2010.

Many businesses have embarked on zero waste and have restructured their whole manufacturing vision and lines accordingly. Output of solid waste from Toyota plants in Japan was aimed to stop completely by 2003 end. Hewlett-Packard in Rosevilla, CA is reporting successfully diverting 97% of its solid waste. Xerox Corp., Rochester, New York has had a Waste-Free Factory environmental performance goal since the early 1990’s. Since then, solid waste recycling rates at Xerox factories

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worldwide have reached 87 percent. In 2000, improvements in product design saved 387 million kilowatt hours of electricity. According to claims by the company it was enough to light 2,90,000 homes for a year. In 1999, Xerox registered $47 million in reduction, reuse and recycling savings. It proved wrong the common contention that intensive waste reduction initiatives are costly. Instead these could be saving money in the long run. Many public institutions and private companies all over the world are helping advance Zero Waste by setting strict environmental and recycling standards for the goods they purchase, like computers and paper. Companies that have adopted the Zero Waste philosophy are finding that it not only cuts garbage production and disposal costs but also reduces manufacturing costs.

In India, Zero Waste is in its very latent stage. The first of such a programme is the “Zero Waste Kovalam”. Digha, a beach destination in West Bengal is also attempting to move to Zero Waste.

Even though, the idea is over sixteen years old it seems to be generating much excitement and enthusiasm. By far, this has established that waste management at the backend alone is a limited proposition. And all over the globe natural environment is becoming a primary driver of a healthy political action and behavioural change. Evidence also suggests that the huge challenges that are present are being met and that the long-term benefits are enormous.

While not many written literature is available regarding Zero Waste and the new initiatives from around the world, many of them can be found in the various websites of these initiatives. The GRRN website, www.grrn.org, provides a view and links to these initiatives along with resource materials for citizens and community groups. There are also many false claims of Zero Waste, many claiming that their old recycling system is Zero Waste, while it is not. Hence one must be watchful of false claims designed to sell machines and technology and also to impress the media and the general public without producing real results.

2.4 ZERO WASTE AND EMPLOYMENT GENERATION

Zero Waste challenges the whole idea of endless consumption without actually talking specifically about it and it enables even those who complain of inertia to change their own behaviour in a positive way without immediately threatening it. And Zero Waste challenges, through job creation and civic participation, increasing wastage of human resources and erosion of democracy. Hence while waste used to go up in smoke in expensive incinerators or go down the leachate drain in land fills, what was a pile of garbage till now, throws up a range of raw materials for new products, viable financial opportunities, and better jobs.

From its inefficient uncompetitive former alternatives, zero waste rechannelises the flow of resources through our societies with marked and substantial environmental, social and economic benefits. Clean production, environmental friendly designs, and products eliminate creation of waste. At the end, zero waste facilitates systems like resource recovery, composting, and waste to wealth ideas to tackle the waste generated. Zero waste ensures the involvement of the local community in its day-to-day processes. Hence it directly leads to the creation of employment opportunities in a society otherwise at loggerheads trying to create new avenues of employment.

Many a time the question has been asked - Will the idea of zero waste lead to dislocation and loss of employment to many engaged in other waste management jobs? Integral to the vision of zero waste is the idea and attempt to build strong communities and local economies. Every step the community takes locally will mean more jobs and more money in circulation in the local economy. In fact just sorting and processing of recyclables sustains five to ten times more jobs than land filling or incineration. The search for employment figures is based on the presumption that recycling (resource management) costs more than incineration or landfill (waste management). In many cases while this is not true, resource management has the additional advantage of retaining the value of the materials collected, while waste management handles the materials for final disposal. Even if some recycling processes could be costlier than incineration or landfill, it adds more back to the economy through other activities such as reprocessing, refurbishment, new design and technologies (beyond collection and separation). Recycling captures resources that would otherwise be lost in traditional waste management practices. Hence it
provides employment potential, better domestic economies, reduces imports of raw materials and an added long term advantage of a change in attitude to “waste” management.

But there is very little reliable data regarding the employment potential of better waste management options. Even the little data collection that is there excludes waste-related activities. For example, in a system like in the towns in India, the informal sector is a large service sector and very little data is available regarding the quantity of discards that is redirected from crude landfills and the employment that this redirection activity gives. The employment potential offered by a recovery system is immense. Moreover, recycling allows the opportunity for more diverse jobs creation from low-skilled to technically-skilled levels and adds value to the economy and other indirect jobs. Landfill, incineration and other disposal methods do not allow this diversity.

Moreover, the shift to zero waste, clean production, better materials design etc offers a shift of job portfolio from dirty jobs to cleaner jobs or jobs that are a service to bettering life on earth.

Another source of employment that Zero Waste throws open is the concept of Resource Recovery Parks (RRPs) or Facilities (RRFs). A resource recovery park is a new development in recycling. In its broadest sense, it is the co-location of reuse, recycling, compost processing, manufacturing, and retail businesses in a central facility. The public can bring all their wastes and recoverable materials to this facility at one time.

An RRP may also be called an integrated resource recovery facility, materials recovery facility (MRF), recycling estate, industrial recycling park, recycling-based industrial park, or discard mall. A number of market forces are encouraging this type of development. Such facilities provide a huge employment opportunity. Future channels for manufacturing and distribution can flow through these comprehensive recovery facilities. This reverses the usual flow of materials, with recovered materials being used at the beginning of the process rather than being left over at the end. Most of our production elements should come from refined resources generated by these recovery processes. Such facilities should include businesses that reuse and repair. An additional qualification of such a concept, especially in employment-starved countries like India is that resource recovery facilities and materials recovery industries are relatively labor-intensive and skill-intensive rather than capital-intensive.

There needs to be a lot of work done on these concepts especially with economists, development experts and in governments to make sure we understand the way resource recovery integrates marginalized social groups into mainstream economic life. Many people left out of the current economy will be able to find interesting and fulfilling work in these efficient and inventive businesses. We will need to change our laws and economic measurements to facilitate this changeover to an abundant economy that rewards creativity, efficiency, community, healthy families and environmental protection.

Employment Generation : Case of Innovative Waste Kaikoura, New Zealand

Kaikoura in New Zealand is one of the first communities to move towards progressive waste management through Zero Waste. Innovative Waste is a Limited Liability Trust Company with charitable status and they manage Kaikoura’s Landfill and Resource Recovery Centre and have a track record of creating employment for long-term unemployed people through recycling. Their mission is to achieve “zero waste” for Kaikoura by 2015, and to facilitate sustainable employment using waste materials and create viable self-funding projects that protect, restore and enhance the environment.

Their Youth Team project aims to address the problem of vandalism in their community and provide young people with employment and training which are both scarce in Kaikoura. Innovative Waste also attempts to change the attitude of the local community to young people with a history of troublemaking. They want to tackle this problem in the community rather than sending them elsewhere as has happened in the past.

The Youth Team project involves taking young people with a history of vandalism, paying them a
wage and putting them with a full-time supervisor experienced in dealing with “at risk” youth. The young people are employed in the recycling operations and have the opportunity to learn mechanical, metalwork and engineering skills. After a work ethic and good relationships with other staff are established, the young people can move on to work on other projects being run by Innovative Waste – growing seedlings, tree planting, roadside work in the district and contract work on reserve land.

By May 2003 the young people had been given experience and partial training in carpentry, painting and decorating, welding, section clearing, metal recovery, greenwaste processing, tractor driving, truck driving, communication skills, timesheets, firewood and timber recovery, care of tools and machinery. This group was set up in July 2000 as a partnership between Kaikoura Wastebusters Trust and the Kaikoura District Council to run the local landfill and resource recovery centre. In the last year, Innovative Waste has gone from employing six full-time and three part-time staff to employing 14 people—nine full-time, one part-time and four young people in need of work experience. They are paid employees working under a supervisor.

The interesting aspect of Zero waste is that it is diverse and locale-specific and each area in the globe would have their own resource recovery and employment generation processes to speak off. Simply speaking, even though the goal is Zero the process could be diverse.
3.1 KOVALAM

Kovalam is a small fishing village on the coast of the Arabian Sea. It is located 12 kms to the south of Kerala’s capital city, Thiruvananthapuram. A series of four crescent shaped beaches, calm and safe waters and a pleasant climate attract people to this place from all over the country and the world. The late Maharaja of Travancore Sree Chithira Thirunal Balarama Varma first brought the world’s attention to this beautiful beach resort when he chose this to be his summer retreat. He built his Halcyon Castle here, which was later converted to a deluxe hotel. The place became a favourite haunt of the foreign visitors who visited the Salvation Army Headquarters in the city of Thiruvananthapuram. Large groups would come and spend a few days of their stay on the peaceful beach, which then had no formal accommodation to offer at all. However the first move to develop this as a seaside resort was done by “Club Mediterranean.” The Government of India and the Department of Tourism endorsed this proposal on two counts - the sheer beauty of the location and its safe bathing waters.

History of Tourism in Kovalam

In 1966 Department of Tourism took over the beach area with an old beach house. Later, the coast excluding the present Guest House Complex of Dept of Tourism was handed over to ITDC (India Tourism Development Corporation) and they built a five star hotel – Ashok Beach Resort- in 1973. KTDC (Kerala Tourism Development Corporation) started Hotel Samudra during the same period. Later ITDC further expanded its hotel resort by adding 72 more rooms. Simultaneously private sector entered the destination, which resulted in overall developments. Developments were mainly concentrated in Vellar Lake and Vizhinjam Light house. In 1975 Kovalam-Vizhinjam Development Authority was set up. In 1972 Dr. Karan Singh (Union minister for Civil aviation and tourism) inaugurated ‘Kovalam Grove’ a beach resort of ITDC at Kovalam. In 1988 the foundation stone for ‘Rajiv Gandhi Conference Centre by ITDC was laid by the then Union Co-minister for Civil aviation and Tourism Mr. Sivaraj V. Patil. In 1995 it was inaugurated by Mr. Ghulam Nabi Azad who was then Union Minister for Civil Aviation and Tourism in the Government of India.

Kovalam was turning out to be one of the major tourist attractions in India. Majority of the tourists were from U.K, followed by Germany, France, USA, Italy, Japan etc. While the nineteen seventies saw the spurt of the first commercial establishments to cater to tourism and the early tourists had to spend the night on the beach, lodges began to appear to accommodate them. Slowly Kovalam became famous in India and abroad. In 1995, chartered tourism was introduced in Kovalam causing a sudden excitement in the local industry. As the local people would vouch, the whole prospect of chartered tourists created an anticipation of increased demand for hotels and restaurants, resulting in more of these coming up in the beach so much so that the beach soon became crowded with these enterprises.

On 24th May 1993 the District Authority (Department of Revenue) and Tourism Development Authority demolished 67 illegal constructions which included, hotels, restaurants, shops and houses. The then District Collector Mrs. Nalini Netto IAS stated that the land evacuated by the authority will be handed over to the Department of Tourism for further development of the destination. According to the local people the same thing happened in 1999 to remove the shell shops which were doing business in the revenue land in Kovalam.

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<sup>4</sup>P.S. Manoj Kumar, R. Jithesh, U.Shyla, Infra Structure Development for Tourism Promotion A case study on Kovalam, Kerala Institute of Tourism and Travel Studies 1998-99

<sup>5</sup>op.cit

<sup>6</sup>Mathrubhoomi Daily 25<sup>th</sup> May 1993
The Ministry of Environment and Forests notified Coastal Regulation Zone for restricting the activities which poses threat to the coastal ecosystem in 1991 (S.O 114. E 19th February 1991). Following this the Government of Kerala submitted a Coastal Zone Management Plan. This Plan notified the strip of beach including Kovalam tourist destination in CRZ-I category where dumping of solid and liquid waste from towns, cities or any human settlement and drawing of ground water within 200 mtrs of High Tide Line is prohibited.

**Occupation:**

Kovalam was enriched with healthy coconut trees. Coconut farming, toddy tapping, extraction of coconut oil, coir making, and fishing were the main occupation of the local people of Kovalam 25 years ago. Behind the Light House Beach on the plains, extensive paddy and vegetable cultivation were done. Coconut plantations were also abundant in this region. Today, sadly this place has no paddy or cultivation to boast of. Coconut is still grown on the hills, valleys and on the land adjacent to the beaches. Fishing, predictably has been the other chief activity of the people of this region. Mechanized boats, catamarans, and other country boats are used to this day for fishing. The “kamba vala”, a large traditional fishing net (shore seine) operated by more than fifty persons positioned on the beach is also used in fishing here. The curio sellers, many of them from Kashmir migrated to Kovalam to sell their commodities. The local fishing community (Muslims) was displaced during the setting up of ITDC hotel at Kovalam. There has been total displacement of an entire fishing community twenty years ago. Later the fishing community faced a partial economic displacement. After displacement 25% of the residents were given plots near the seashore but they were once again moved to interior areas, while the rest were taken to the nearest hilly area about 1 km. away from the sea shore. According to local fisherman, today the population of this community is about 700.

**Tourism, Growth and Garbage:**

Kovalam like most “discovered spots” was soon loved to death. The natural abundance of the place gave away to stinking corners, heaps of garbage and smoke filled skyline. The problem of waste mounting up in this destination together with the most dangerous practice of burning this waste and the draining of untreated liquid waste directly into the open drains and the beach caused serious threat to the land and health of its people - grave enough to affect the business of tourism in Kovalam.

Being an unplanned tourist destination, it also lacks facilities for waste management. The inefficient control or guidance over the activities along the coast of Kovalam tourist destination in its earlier phase of development left no space, time or resources for handling the waste generated in the region. The issue of stinking waste grew with its mounting garbage and smoke to rock the business of the tourism in the region. The normal practice of waste disposal in the region was collection of waste from the shops and dumping them in neighbouring village during the nights. When people’s opposition became strong, the people compelled the local Panchayath and Department of Tourism to provide facilities for waste disposal in the region.

The Directorate of Panchayath allotted Rs.25 Lakhs to Vizhinjam Panchayath from State fund for having a facility for waste management. The Department of Tourism acquired 50 cents of land near Avaduthura which is behind the light house beach. The Department of Tourism proposed an incinerator to burn the waste generated in the region.

3.2 THE BEGINNING

Kerala has a peculiar situation, where Tourism Industry is perceived as a major contributor to the State’s economy. But “God’s Own Country” was gradually being converted into a land trapped by the

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7 T.G. Jacob, Search for People’s initiative: Discussions on tourism development in Keralam, Equations, September 1999

8 B. Vijaya Kumar, Impact of Tourism Development: A Pilot Study of Kovalam Beach in Kerala, University of Kerala, April 1993.
waste and the wasteful culture that many tourists were bringing and subtly, quite unsuspectingly inducing. The result was a growing problem of waste left over and thrown out in all the major destinations in the State. This demanded immediate intervention, which the Tourism Department inadvertently did in 1998. They proposed incinerators in the major destinations in Kerala. One of these destinations was this International Beach Resort at Kovalam. The public found this objectionable and launched a protest campaign. The Kovalam Poursamithi (Kovalam Citizens Forum) printed and distributed notices against the incinerator and led a march to the Ministers bungalow. Almost at the same time Thanal along with international environmental organization Greenpeace and Equations, a research organization based in Bangalore and working on Tourism related issues, came together to issue a public alert against the implementation of this project, warning of possible health and environmental dangers that lurks behind such waste burning technologies. On 25th June 1999, a joint press meeting was called to launch the campaign against Incinerators in the State of Kerala. Soon, Thanal raised this issue in the Tourism Policy Workshop organized by the Department of Tourism.

Thanks to a receptive and progressive Director of Tourism, Dr. V. Venu, in July 7th 2000, the projects were shelved. While this put the curtains down on an environmental struggle, even before the first stone had been laid for the project, it still left the pertinent question – what do we do with the waste issue in Kovalam?

The money released from state funds for installing the incinerator had been passed to the Vizhinjam Panchayat. The Panchayat started using that fund for the waste management activities. It was due to the intervention of the Ombudsman who asked the Panchayat to remove the waste accumulated at Kovalam tourist destination. As a short-term solution, the Panchayat started collecting waste from the region and dumped in other places where opposition was weak. But nevertheless, there arose a demand for long term and permanent solution for the waste in Kovalam. So the Tourism Information Office at Kovalam proposed to make use of the land acquired for incinerator and to utilize it as a central storage place for the waste collected from a region lying between Poovar tourist centre in the south and Samudra in the north of Kovalam beach. The idea was to get the help of the local women groups called ‘Ayalkootam’ on a remuneration basis for the task of collecting the waste from the hotels and shops in this region and supply it to the Thiruvananthapuram Corporation which will transport the waste to their own waste disposal facility at Vilappilsala. For this the Department of Tourism started the construction of a road. Again it invited the people’s opposition since they know the suffering of the local people at Vilappilsala. They did not want a garbage dump yard in their neighbourhood and opposed the construction of the road. This was also stopped in November 2000, much to the dislike of the local Tourism officer.

By now Thanal was contemplating seriously within the team on whether to take up the waste issue in Kovalam. After much research and discussions with experts all over the world, it was decided that Zero Waste should be the way forward for the community in Kovalam towards an everlasting solution to the waste problem. The choice of Zero Waste as an answer to waste management was a carefully thought out one. In many ways, Zero waste attempts to steer clear from the present garbage crisis in a manner that is economically remunerative for the community and more so because it is environmentally and socially just. It’s a logically planned step incorporating principles of effective human and material resource utilization to avoid the conversion of discards into waste in a manner that revitalizes the economy too. And most of all the zero waste approach has as its innate ingredient a respect for following nature’s cyclical flow of resources.

In November 2000, there was a series of discussions with the Tourism Director and he requested Thanal to look at the waste issue in Kovalam, on the lines of a systems approach, involving the community and other stake holders. Discussions were also held with Kerala Hotels and Restaurants Association (KHRA), who showed keen interest in working together on a lasting process which promised to reduce resource use and also keep waste from reaching the open beaches, roads and drains.

The First Survey:

In February 2001, Thanal set up a team of researchers to look at the issue of waste in Kovalam. A literature survey on history of tourism and related issues of Kovalam was started and the team began a
wide range of discussions via meetings and list-serves with experts in the field of Zero Waste and other ecologically sensitive discard management methods from all over the world. The main focus of the study was to establish baseline information on the type and quantity of the discard stream produced by commercial activities in the Kovalam Tourist Village. The team also documented the garbage handling process and interacted with the president Sri Mukkola Prabhakaran and members of Vizhinjam Grama Panchayath (the Local Self Government). Interactions also started with scrap merchants, garbage handling workers, shopkeepers, head load workers, Kerala Hotel and Restaurants Association members, officials of the Department of Tourism etc. The study also identified the main sources of liquid and solid waste and waste dumping and burning sites. Interviews and Questionnaire surveys were used to elicit information regarding discards as well as the attitudes and preferences of the various sections of the community towards the generation of waste and their disposal practices. Mapping of garbage dumpsites at Kovalam was also done. All the movements and dumping sites of garbage were documented. The Zero Waste Team (ZWT) also interacted with the people who were suffering from garbage dumping, especially at Muttakkad, Vazhamuttom, Vellar areas, which are mostly in Venganoor Grama Panchayath and bordering Thiruvananthapuram City area. These were places at the receiving end of the tourism intensive activity in Kovalam.

The survey identified about 562 commercial establishments in the Kovalam Tourist Village area of which 250 shops were operating during the study period. 171 establishments (30%) were surveyed and the quantity of discards categorized into bio-degradables, drinking water bottles, other plastic bottles, plastic carry bags, plastic covers, milk sachets, paper, plastic cups and other miscellaneous discards such as cotton, cloth, cut hair, cardboard boxes etc. The discards were also categorized according to the source of its generation so as to identify the key players in the waste generation process.

Some of the findings of the study is discussed below.

TABLE 1: ESTABLISHMENTS SURVEYED (FEBRUARY-OCTOBER 2001)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Surveyed</th>
<th>% Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel</td>
<td>51</td>
<td>28</td>
<td>55%</td>
</tr>
<tr>
<td>Restaurant</td>
<td>66</td>
<td>33</td>
<td>50%</td>
</tr>
<tr>
<td>Lodges</td>
<td>73</td>
<td>28</td>
<td>38%</td>
</tr>
<tr>
<td>Pettryshop</td>
<td>25</td>
<td>15</td>
<td>60%</td>
</tr>
<tr>
<td>Bakery/Coolbar</td>
<td>10</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Provision/Fruit/ Veg shops</td>
<td>23</td>
<td>6</td>
<td>26%</td>
</tr>
<tr>
<td>Textiles &amp; Tailoring</td>
<td>44</td>
<td>17</td>
<td>39%</td>
</tr>
<tr>
<td>Curios</td>
<td>109</td>
<td>9</td>
<td>8%</td>
</tr>
<tr>
<td>Beauty Parlor</td>
<td>3</td>
<td>1</td>
<td>33%</td>
</tr>
<tr>
<td>Massage parlors</td>
<td>32</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Communications</td>
<td>32</td>
<td>6</td>
<td>19%</td>
</tr>
<tr>
<td>Travel / Services</td>
<td>31</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td>Beverages</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>General stores</td>
<td>62</td>
<td>13</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>562</strong></td>
<td><strong>171</strong></td>
<td><strong>30%</strong></td>
</tr>
</tbody>
</table>

In a nut shell, the following were found to be discarded in Kovalam everyday - either burnt, buried or simply dumped into Kovalam, on the beach, water bodies and roadsides.

Biodegradable Waste       - 6.7 Tonnes per day
Plastic Mineral Water Bottles - 6098 Nos. per day
Plastic Carry Bags - 1464 Nos. per day
Plastic Milk Covers - 2762 Nos. per day
Paper waste - 135 kg per day
Plastic cups - 720 Nos. per day

Other discards like Cardboard boxes, cotton waste, cloth waste, cut hair waste, used oil etc were also in relatively significant quantities.

Along with the characterization of discards, the questionnaire was also meant to collect information on the attitudes, observations and ideas of local people on waste issues and its solutions. Parallel to these efforts the team also prepared maps to identify and illustrate waste dumps in the region, identify key local players and stake holders and started a dialogue with them on making Kovalam a zero waste area, even as they went about studying the issue. The survey process was completed in the month of October 2001. The findings and the proposed Zero Waste process was brought out as a report - “Towards Zero Waste Kovalam – A Draft Report, November 2001”.

A compilation of Zero Waste experiences and literature available from various organizations all over the world regarding the various aspects of Zero Waste was also brought out. This was meant to be a resource compilation for people who wanted to learn more about Zero Waste. In August 2001, a “ZeroWaste” special edition of the newsletter “Toxic Alert-Keralam” in Malayalam was brought out which became a resource material that could be widely shared in campaigns. A Skill share on “Towards Zero Waste Kovalam” was then organized at Kovalam.

“Towards Zero Waste Kovalam – A Skill share”:

A two-day long skill share on 19-20 November 2001, was organised as the outcome of the many discussions that Thanal had with the members of the local community at Kovalam, the businesses and the tourism department. It became a platform to discuss and share experiences on waste related issues and opportunities. The skill share was jointly organised by Thanal, Greenpeace, KHRA and the Tourism Department of the Government of Kerala. Dr. Paul Connett, Professor in Chemistry and an expert in Zero Waste gave a key note address and led the discussions. Of the many who participated were members from the Government, experts from all over the world and local community members from all sections. The preliminary survey and the findings on discards generated in Kovalam were presented. This helped the participants to focus on specific issues to come out with solutions. The participants were unanimous in identifying two streams of discards that needed to be immediately tackled. One was the discards from the kitchens of hotels and restaurants - the biodegradable discards and the other the disposable plastic discards in the form of carry bags, plastic bottles, milk sachets, cups and covers. There were separate panel discussions to address these two problems specifically.

The panel discussions on biodegradables finally concluded that anaerobic digestion (using biogas plants ) will be a good method to deal with the biodegradable discards of Kovalam. And the panel discussion on disposable plastics concluded that they should be phased out from Kovalam. The Hotels were keen to learn more about the alternatives to plastic products. At this skill share program, two things happened that turned the very nature of the programme. The first was the display of eco-friendly products by Murali, an indigenous artisan and craftsman par excellence of various utility items made out of used coconut shells, Bamboo products by Uravu of Wyanad and products made from used newspaper and discarded cloth by street children from the Karm Marg an organisation based in Delhi. The second was the question posed by the women’s group as to how all this would benefit them as well. Thus was born the idea of the Materials Substitution and Training where women from neighboring panchayaths would be trained to produce various items from discards and from eco-friendly materials to substitute and replace the toxic plastics use. Thus from the idea of converting waste into usable items emerged a possibility of employment and generating income for the women as well.

The skill share concluded with the floor entrusting Thanal to prepare approach papers for these two
identified components in the discards stream and to implement a programme for handling it. The local Women’s SHG representatives Ms Sarala Devi and Ms Sobhana who were present in the skill share opined that they be trained in producing these alternatives with the locally available materials.

Post-Skill share:

Soon after the skill share the Zero Waste Team got to work on producing approach papers for biodegradable discards and non-biodegradable discards. This started with a detailed study to quantify the discards from hotels and to identify its characteristics. This survey, which was an assessment of the actual quantities during peak season, was done in the month of January and February 2002. A student of environmental engineering, Mr. Manoj Sreenivasan led the team to study the biodegradable waste and the potential for biogasification. The study quantified the waste generation pattern in hotels and restaurants and the data went as input to the approach paper on biodegradable waste. This approach paper also looked at the feasibility of biogas plants in Kovalam. Manoj also conducted a technical feasibility study of biogasification with the waste composition available from Kovalam. The results of the survey also went into preparing an approach paper for the non-biodegradable disposable discards like plastic covers, carry bags and drinking water bottles.

While these two were identified as priority tasks, two other areas of work were also gaining importance. One was Material Substitution and the associated training activities and the other Awareness programme, which were demanded by many, especially for SHG’s and Schools in the locality. Following up the panel discussion on plastic disposables, Thanal enquired into the options and possibilities of sustainable alternatives, especially to plastics. The representatives of Women SHGs of Kovalam already showed interest to take up the opportunities arising from material substitution.

The year that followed the skill share in November 2001 was marked with varied activities, all of them leading to an action plan that was already happening even as it was being planned. Most of the activities of Zero Waste Kovalam were simultaneously community demand driven and at the same time being built into an action plan.

3.3 THE PROJECT

Zero Waste Kovalam has five concept driven programmes.

a) Resource Recovery Programmes:

This is the backbone of discards management in the Kovalam Tourism Area, which is the Project Area and extends to a slightly larger area (an entry or buffer zone), which is designated as a programme area. Decentralized resource recovery facilities have been designed for making discards handling easy and effective. More over any place in Kerala would not be able to afford capital-intensive large-scale facilities as the land availability is low with density of population over 2000 people per sq. km, especially along the coast. Two approaches are followed for implementing resource recovery

Resource Recovery Facility at Individual or Institutional level: This is specially targeted for homes/institutions who have some space to spare and their own in-house discards to be handled. As a model the Institute of Hotel Management and Catering Technology (IHMTCT), the premier institute of hotel management in India located at Kovalam was the first to set up such a facility in April 2003. The institute has a student-staff strength of 500. A Resource Recovery Facility consisting of a 15 cu.m. biogas plant, a Resource Recovery Room, Compost pit and Drying yard has been setup. The Biogas plant converts 250 kg of biodegradable discards from their kitchens and canteens into biogas every day. The institute is saving nearly Rs. 5000 on cooking gas every month. In addition the facility during 2003-2004 (one year) diverted 5 tonnes of non-biodegradable discards and earned about Rs.12,000 in this account. It also created one full-time and one part-time job. Till 2003, all these discards were being burnt on the same
ground that the facility is built now. Hotel Samudra has also commissioned a 15 cu.m. biogas plant under the programme and has taken steps to replace their diesel fuelled boiler with biogas which is expected to save them 20 litres of diesel a day! It is estimated that on an average the hotel will save nearly Rs.1.5 lakhs annually and will create an additional job opportunity. Inspired by these model initiatives, many households and hotels are building their own biogas plants.

**Cluster Level Resource Recovery:** This is designed as a decentralised but common facility for a cluster of individuals / institutions. The first of such a cluster facility was set up by the Kovalam Unit of the Kerala Hotel and Restaurant Association (KHRA) jointly with Kerala Tourism. This 25 cu. m. biogas plant can take 500 kg biodegradable discards per day. Waste from 15 restaurants on the Light House Beach area is used to feed this biogas plant. The biogas is used to run a 2.5KVA diesel generator to produce electricity for street lighting in the beach. A Non-Biodegradable discards collection is also being done, by collecting the segregated discards. A local secondary materials dealer has been entrusted with this and he gains about Rs. 600 every month. Besides these, this cluster facility has generated three full time jobs, by way of collection, feeding and maintenance operations. Kovalam needs at least three more such cluster facilities, if it has to take on all discards that are generated in the peak season. This is apart from the individual level ones that could be coming up. In the household level, process is on to form clusters to link biodegradable discards from domestic sector with biogas plants / vermi-compost / compost pits. Micro Resource Recovery Facilities handling the non-biodegradable discards are planned at the community platform-level and these could be routed to the Central Resource Recovery facilities. One such Resource Recovery Facility is planned in the Vellar ward of the Venganoor Panchayath, which is at the entry point of the Kovalam Tourist Area.

**Periodical Cleanups:** Inspite of these measures it is expected that Kovalam would need to have a periodical cleanup operation, which can mobilize not just the local stake holders and the panchayath but can be made eventful with the help of even the tourists who would wish to volunteer. Periodical Cleanups organised by Panchayath, the Indian Coast Guards, Students of IHMCT, Greenpeace along with Thanal has been organised and these cleanups are gradually removing the historical waste in the area. In each of these cleanups tens of thousands of murky discards in various stages of decay could be fished out from the beach, rocks, streams and ponds. In December 2003, Greenpeace and Thanal together launched the Extended Producer Responsibility (EPR) Campaign against the mineral water and soft drinks manufacturers specifically targeting the major brands Coke and Pepsi against dumping of their bottles and desecrating the village and the beach destination. As a first step over 2000 PET bottles littering the beach were sent back to these Cola manufacturers demanding that Corporations like Coke and Pepsi should implement EPR. Extended Producer Responsibility drives home the message that what cannot be reused, recycled or composted, should not be produced in the first place. It is not the community, local government or the environment that should pay the heavy price for the gains of corporates. The Clean-Up activity coordinated by Greenpeace and Thanal marked another important milestone in the three year long campaign to take Kovalam towards zero waste. A major clean up drive was organised again in January-February and in March 2004 to remove pet bottles dumped in and around. A total of about 72,000 PET bottles were collected and sent for recycling.

b) **Material Substitution:**

This programme envisages people from the locality producing materials that are eco-friendly like coconut shell, used paper, cloth etc to manufacture various utility and craft items that are to phase out the toxics like plastics. The programme gives emphasis on women and youth. About 300 women from various Self Help Groups participated in the first levels of training in Coconut Shell, Paper products, Cloth and Jute bag manufacturing, Bamboo products etc. Many women have established Units for Paper
Products and Coconut Shell products and also Cloth/Jute bag manufacturing. One group of 6 women are being trained in appliqué work using discarded fabrics from the destination. In the discards some materials adds more problems. Plastics discards and PET bottles are examples. Aiming at total elimination of plastic discards and other toxic materials a phase out programme has been launched and the materials substitution builds capacity in the community to come up with locally available and environment friendly materials to replace these toxic substances.

c) Poison free farming:

Zero waste Kovalam programme focuses on regaining the environment stewardship in agriculture which will help in building a toxic free world. Agriculture became more dependent on external inputs like chemical fertilizers and pesticides. The soil gets polluted with toxic chemicals that in turn pollute the ground water, streams, ponds and lakes. The food from the land and water thus get poisoned. The programme addresses this issue by promoting poison free farming. Local farmers were given technical assistance and training for applying community wisdom and traditional knowledge for a toxic free agriculture. “Land and Food without Poisons” is the objective. Venganoor Panchayath has already planned for the same and more than 100 women from 10 SHG’s have started organic farming beginning with vegetables and banana. The program focuses on restoring the homestead farming culture of this land, considering that it is bound within the family and sustains diversity and provides food, fuel and other needs. Local women started producing processed food out of organic produce as another value addition. Inspiringly women participation is dominant in production sector and marketing sector. Activities taken up as marginal activities now became mainstream sustainable business that yields them decent profit.

A monthly farmers market – the Organic Bazaar - is being organised for the last one year for supporting many of the local farmers and to bring producer and consumer in direct contact for building a healthy relationship and to reduce middlemen and thereby exploitation. The market also became a platform to discuss and share the issues and concerns of farmers and consumers. The Organic Bazaar is a concept put forward by the Institute for Integrated Rural Development in Aurangabad and Thanal took this up to support the small, marginal and landless organic farmers in the area.

d) Water Conservation:

Water is the prime life support resource and is a community property. The villages around Kovalam have severe water shortage. Private business lobbies started exploiting the opportunity by setting up private water supply services and exploiting common resources. Lack of safe drinking water resulted in accumulation of PET bottles at Kovalam. This year 72,000 discarded bottles were picked up from waste dumps and ponds etc and send out of the village during clean up programmes. The Vellayani Kayal, a fresh water lake bordering the Venganoor Panchayath is a major source of water for the villages as well as the hotels in the destination, both directly and as a source replenishing the ground water. This is a highly polluted source of water especially due to the intensity of pesticide and chemical fertilizer use in the area. The streams and ponds in the destination area are also in an extremely bad condition and an integral part of the programme is to revive these sources of water. Alternate drinking water schemes, that can replace the plastic bottled water supply, also need to be introduced. For this some suggestions are made like introducing Dispenser Bottles – large 20 litre and more cans, which can dispense water in bottles that the tourist can be provided from hotels, introduce medicated water - guaranteed by an agency such as the local panchayath, introducing Water Kiosks maintained in specific points in Kovalam and run by head load workers unions, SHGs etc. These can bring in more participation as well as guarantee that use and dumping of the smaller plastic water bottles is avoided, and giving an added incentive for the community to protect and keep their water sources clean and
e) Training, Education and Environmental Awareness:

Thanal with the support of the Kerala Tourism (Government of Kerala) set up the Zero Waste Centre at Kovalam as a resource use education centre. The centre provides regular awareness classes for the students from the nearby schools under Children for a Toxic free world programme. Farmers are given training on organic farming, vermicomposting, marketing of farm products under the Poison Free Farming programme. Local women groups and youth are trained on various vocational training programmes at the centre under Material Substitution programme. The centre is also giving orientation programmes for policy makers in Government as well as private institutions regarding developing proper discard handling methods and zero waste. About 300 women from the locality were given vocational training. In 2 years time about 100 new jobs have been created and 2 small-scale industrial units, run by women, have emerged as a result of this. Today most of this has been put to practice. The centre has doubled up as a platform where training and production happens. Coconut shell products, items from tailor-wastes, paper bags, and other utility items are produced here. The women who get trained at the centre go back home, group themselves together and come out with innovative products. They are also getting valuable training on ways to make their items more attractive with better designs and artwork. Jute items are also being touted as a good substitute to the plastic bags. Training for enterprises run by women and youth also focuses on Leadership, Office Management, Account Keeping, Market promotion and other Capacity Building processes.

Two of the immediate benefits that are seen through these programmes is

1. **Employment Generation** - Especially through material substitution, better resource utilization and through poison free farming by women, there has been employment generation especially from coconut shell product manufacture, paper products and organic vegetable production. Even ethically and efficiently managed waste management has started producing employment opportunities.

2. **Resource Use Minimization and Recovery** – The aim is to have an effective minimization of resource use and to recover the maximum resources from waste.
CHAPTER 4

STATUS OF EMPLOYMENT IN KOVALAM

The scope for employment in an area is dependent on various factors. The opportunity the area provides is dependent on the skills available or accessible, the raw materials – natural or produced, its availability and accessibility, the demand for such jobs or services, and also the socio-economic and political status of the area. The predominant employment available in the area also continues to influence future possibilities but depends much on the support provided by the larger society as well as the Governments – local and other.

The Kovalam Beach Destination area lies in two panchayaths and also in the Corporation area of Thiruvananthapuram. The two panchayaths are Vizhinjam and Venganoor. The employment status data available in both the panchayaths nearly represents the specific Kovalam area and the attempt here is to understand on what livelihoods people are dependent on in Kovalam.

The Vizhinjam Panchayath where the major part of the Kovalam area is situated is predominantly dependent on Agriculture and Fishing for employment. The Panchayath development report of 1996 shows that 64.55% of the population is dependent on farming, as agricultural labourers or in the animal husbandry and fishing sectors. As per the 1991 census, the population of the Panchayath is 42,402. The Kovalam ward has a population of only 2518 (which is just 6% of the total population of the Vizhinjam Panchayath).

<table>
<thead>
<tr>
<th>Employment</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>867</td>
<td>55</td>
<td>922</td>
<td>7.51</td>
</tr>
<tr>
<td>Agri: labourers</td>
<td>2204</td>
<td>294</td>
<td>2498</td>
<td>20.38</td>
</tr>
<tr>
<td>Animal husbandry / fishing</td>
<td>4481</td>
<td>14</td>
<td>4495</td>
<td>36.66</td>
</tr>
<tr>
<td>Stone crushing</td>
<td>13</td>
<td>14</td>
<td>27</td>
<td>0.22</td>
</tr>
<tr>
<td>Cottage Industry</td>
<td>171</td>
<td>105</td>
<td>276</td>
<td>2.26</td>
</tr>
<tr>
<td>Non-Cottage Industry</td>
<td>490</td>
<td>194</td>
<td>684</td>
<td>5.58</td>
</tr>
<tr>
<td>Construction workers</td>
<td>278</td>
<td>18</td>
<td>296</td>
<td>2.41</td>
</tr>
<tr>
<td>Trade, Industry</td>
<td>907</td>
<td>406</td>
<td>1313</td>
<td>10.71</td>
</tr>
<tr>
<td>Transportation/communication</td>
<td>328</td>
<td>19</td>
<td>347</td>
<td>2.83</td>
</tr>
<tr>
<td>Govt. service and other service</td>
<td>988</td>
<td>415</td>
<td>1403</td>
<td>11.44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10727</strong></td>
<td><strong>1534</strong></td>
<td><strong>12261</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Development Report Vizhinjam Panchayath-1996

In Venganoor Panchayath out of a population of 28,742, 45% of the employed has agriculture as the main occupation. Traditional industries including handloom, coir etc constitute the next major occupation (10%). People are also engages in animal husbandry, fishing, as construction workers.
and in Government services. While none of the traditional industries are a major livelihood option, there are about 200 people who solely depend on handloom, a major part of them linked with the cooperatives.

<table>
<thead>
<tr>
<th>Employment</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>187</td>
<td>29</td>
<td>216</td>
<td>3</td>
</tr>
<tr>
<td>Agri: labourers</td>
<td>1978</td>
<td>1046</td>
<td>3024</td>
<td>42</td>
</tr>
<tr>
<td>Animal husbandry / fishing</td>
<td>451</td>
<td>125</td>
<td>576</td>
<td>8</td>
</tr>
<tr>
<td>Stone crushing</td>
<td>186</td>
<td>174</td>
<td>360</td>
<td>5</td>
</tr>
<tr>
<td>Cottage Industry</td>
<td>348</td>
<td>516</td>
<td>864</td>
<td>12</td>
</tr>
<tr>
<td>Non-Cottage Industry</td>
<td>48</td>
<td>24</td>
<td>72</td>
<td>1</td>
</tr>
<tr>
<td>Construction workers</td>
<td>624</td>
<td>96</td>
<td>720</td>
<td>10</td>
</tr>
<tr>
<td>Trade, Industry, Commerce</td>
<td>104</td>
<td>40</td>
<td>144</td>
<td>2</td>
</tr>
<tr>
<td>Transportation/communication</td>
<td>68</td>
<td>4</td>
<td>72</td>
<td>1</td>
</tr>
<tr>
<td>Govt. service and other service</td>
<td>582</td>
<td>426</td>
<td>1008</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4679</strong></td>
<td><strong>2521</strong></td>
<td><strong>7200</strong></td>
<td><strong>-</strong></td>
</tr>
</tbody>
</table>


Earlier Studies show that 30 years ago coconut farming, toddy tapping, extraction of coconut oil, coir making, and fishing were the main occupation of the local people of Kovalam. Agriculture and fishing were the main source of income of people in Kovalam. Stone breaking (metal work) also provided job opportunities for many. This business started about 48 years back, with the construction of Thiruvananthapuram International Airport. The Construction of the Vizhinjam Port also demanded quarrying. Later in the 1980's and 90's the massive building up of the area due to development in the tourism sector also benefited this field.

4.1 TOURISM AND EMPLOYMENT

In the last two decades, there has been a totally unplanned tourism development in the area, causing serious social and environmental problems. The problem of waste in the area is a direct fall out of this development. The Tourism Industry in Kerala has been projected as a major industrial opportunity for economic development and for employment generation in the State, with a scope unprecedented in the history of the State. As early as in 1986, Kerala declared tourism as an industry and announced many concessions and incentives. Concessions were declared for development and promotional activities such as construction of hotels. This was specifically focussed to encourage small-scale entrepreneurs set up Tourism-based infrastructure and services. Institutes were started to have trained and professional manpower, so as to fully exploit the employment opportunities in this sector. The Kerala Institute of Tourism and Travel Studies (KITTS) started in 1988, Institute of Hotel Management and

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9 T.G. Jacob, Search for People's initiative: Discussions on tourism development in Keralam, Equations, September 1999

10 op.cit
Catering Technology (IHMCT) under the auspices of the Ministry of Tourism, Government of India at Kovalam and other institutions in the private sector were set up to supply trained manpower to the Travel and Hotel Industry.

The unemployment in Kerala is around 4 million. This is 10% of the unemployment figures in India (41.6 million) despite of the fact that its population is only 3% of the country’s population (Kerala: 30 million, India: 1000 million). The Kerala Government believes that the manufacturing sector has very poor prospects and the agricultural and the traditional sector is faced with severe threats, hence tourism is considered to be the best alternative for priority in the State development. The State also believes that Sustainable tourism development not only improves the State’s income, but brings in valuable foreign exchange and increases employment and results in distribution of benefits across the State as opposed to most of the other sectors which tend to localise the economic and social benefits to a particular region.11

Some serious questions have been raised to this proposition. Has this been achieved in the last two decades? Have there been any assessments of such achievements? What kind of jobs are produced in this sector and how much would be the local participation in employment? Or has there been any direct and indirect benefit of such development to the local community? These questions have been often raised in the various critics of Tourism Planning. One another issue that stands foremost in this debate is the whole issue of financial planning where the manufacturing, agricultural and traditional sectors were negatively-prioritised to benefit the tourism sector, even as the benefits derived from tourism is yet to be accounted. There has been as is evident from the earlier paragraph the hypothesis that Tourism is an industry that has better potential than trying to revive the highly employment generating sectors of agriculture and traditional cottage industry and even fishing.

The Economic Review 2003 of the State Planning Board also says that being a service industry, tourism creates “employment opportunities for local population” through direct jobs in establishments like hotels, restaurants, tourist shops and travel agencies and also in the transport, handloom and handicraft industries. Direct employment is also generated for certain category of workers like interpreters, guides, tour operators etc., apart from indirect employment opportunities. It estimates that the total employment generated in the sector both direct and indirect is about seven lakhs. It also estimates that with the accelerated investment in tourism sector, there should be direct employment opportunities for over ten thousand persons every year. In 2003, the travel and tourism industry in Kerala was expected to yield directly 378600 jobs, or 3 percent of total employment. A total of 788600 jobs (direct and indirect) or 6.2 percent of total employment are expected to be generated across the broader spectrum of the travel and tourism economy. Over the next ten years Kerala’s travel and tourism industry is expected to create 757100 jobs while the broader travel and tourism economy is expected to create 1.4 million new jobs.12 These figures are indeed tall and positively over arching, but no research papers have been able to show that these are real on the ground or has been achieved.

Let us look at some secondary information available from Kovalam, so as to have a better perspective of this big question of employment.

In the last half a century, Kovalam has undergone great changes from an idyllic coastal village to be a modern epitaph of development – a beach destination catering to the leisure and sea-loving tourist. Kovalam was a small coconut and fishing village, where cultivation of coconut trees for making copra and oil, manufacturing coir from the husks, trading these products by means of bullock-carts constituted the main economic activity apart from fisheries. Now, cultivation of coconut trees is seldom done systematically, a large number of trees are being cut down making way for tourism activities. Mushromming of concrete buildings has eliminated a deep routed culture to an extent.13

11 Mr Justice Sukhdev Singh Kang, Governor of Kerala, Paper presented at International Colloquium on Regional Governance and Sustainable development in Tourism-driven economies at Cancun, State of Quintana Roo, Mexico.

12 State Planning Board, Economic Review 2003, pg 241-242

The Master Plan for the development of Kovalam prepared in the context of the deteriorating situation, also presents some interesting facts regarding the social fabric which influences the changes in the area. In Kovalam, “the Hindus, especially the Ezhavas have emerged as the dominant community followed by Dalit, Nadars, Muslims, Hindu-Arayas and Latin Christians. Nairs though educationally advanced are a minority. Nowadays, a majority of the Ezhavas has switched over to hotel business leaving the traditional activities.” Interestingly, the Ezhavas, a community known for its struggles and its enterprising nature could see the opportunity offered by the development of tourism in the area. All the other communities cannot be said to have gained any major advantage. Tourism has also changed the social constitution of the area by increasing the presence of a floating population, such as tourists, workers and related migrants. Majority of the migrants are engaged in business and related activities, especially, as workers in hotels, restaurants and shops and as street vendors selling fruits, garments etc.

One question that is raised in the analysis of Tourism and its impacts is whether Tourism development increases employment potential. Surveys have shown that in Kovalam while the majority of the local people clearly feel that tourism in their area has decreased employment for them. At the same time, the hotel management opined that tourism has increased the employment potential in Kovalam. But it was also learnt that persons who own almost 40% of the hotels in Kovalam are from other districts and states and they employ their own people in hotels. Other hotels owned by some local families also engage staff from outside Kovalam. Hence it was true that natives rarely get employment in hotel business in Kovalam. Even as planners and proponents of tourism development, including the Government, specifically claim that local community would benefit by way of increased jobs, the ground reality is not so.

TABLE 4:

<table>
<thead>
<tr>
<th>Category</th>
<th>Employment Increased</th>
<th>No Change in Employment</th>
<th>Employment Decreased</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel Management</td>
<td>97.26</td>
<td>2.74</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Local people</td>
<td>24.39</td>
<td>24.88</td>
<td>50.73</td>
<td>100.00</td>
</tr>
</tbody>
</table>

On an average day of activity (peak season) it is estimated that the following category of people are at Kovalam every day. The total tourist population as per the accommodation capacity of the destination is 1950 and the number of excursionist (domestic tourist) is over 2000/day in a peak season.

TABLE 5:

<table>
<thead>
<tr>
<th>Category of people</th>
<th>No. of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locals</td>
<td>2518</td>
</tr>
<tr>
<td>Employees of establishments</td>
<td>2000</td>
</tr>
<tr>
<td>Domestic tourists</td>
<td>2000</td>
</tr>
<tr>
<td>Foreign Tourists</td>
<td>1950</td>
</tr>
<tr>
<td>Hawkers and street vendors</td>
<td>250</td>
</tr>
</tbody>
</table>

14 op.cit
Surveys have also established that in Kovalam the majority of the hawkers and vendors (57.14% of them) are natives of Kovalam. 14.29% belong to Thiruvananthapuram, the nearest city and 23.81% of the sellers belong to outside Thiruvananthapuram. Only 4.76% belong to outside Kerala. The same study also showed that of the metal workers 90% of them belonged to Kovalam itself.\textsuperscript{15}

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Category & Kovalam & Trivandrum & Outside Trivandrum & Outside Kerala & Total \\
\hline
Vendors and Sellers (%) & 57.14 & 14.29 & 23.81 & 4.76 & 100.00 \\
\hline
Metal Workers (%) & 90.00 & 10.00 & 0.00 & 0.00 & 100.00 \\
\hline
\end{tabular}
\end{table}

Surveys have also established that the hawkers and street vendors are in loggerheads with the present paradigm and state of tourism development in Kovalam. The Hotel Managements, Foreign Tourists, Domestic Tourists and the Local People expressed their irritation on hawkers and sellers. A large number of them (30-48%) expressed that the sellers were the real nuisance for them. Tourists who come here to spend holidays in quietude and a pleasant atmosphere want to keep the hawkers away from them.\textsuperscript{16}

Even as in the last two decades Tourism development has built up the area in terms of infrastructure that cater to the tourists needs, it has despoiled the area with social and cultural problems for the local population and with constructions and waste. At the same time, the tourism sector has not been able to improve the lives of the common population, apart from the little trickle the common people get by way of the various menial jobs offered by the sector.

While Kovalam is a well-known destination with supposedly international standard facilities, even a glancing look at the infrastructure catering to community needs would reveal the great divide. The facilities that communities usually need are for education, communication, transportation, recreation, health etc. There is only one elementary school near Vizhinjam Harbour and the local children have to go to schools in the Venganoor Panchayath or to Thiruvallom and other parts of Thiruvananthapuram City for higher education. Kovalam does not have a good health facility, except for a public health centre at Vizhinjam. People have to go to hospitals in Thiruvananthapuram City for treatment. Even though, communication facility by way of STD/ISD booths and Internet facilities have sprouted up in the area, there is only one post office at Kovalam Junction. But catering to the tourist needs are a number of unauthorised commercial facilities. Local people expressed that the price of essential commodities became high due to the growth of tourism. Consumer behaviourism has spread every nook and corner of Kovalam. It has advantages for the business groups and disadvantages for the common people. The whole zone has no recreation or cultural facilities where the local people can go and enjoy a few good moments. Instead all the cultural facilities are confined inside the walls of the major hotels and restricted to the tourists. Open spaces that used to be playing and living grounds for fisher folk and children have all been closed and converted to tourist facilities and the local population, especially women, does not access even the beach.

Kovalam may have been rated as one of the best beach resorts in Asia, but in terms of the returns to the social, cultural, economic and environmental development of the area and the local community, the

\textsuperscript{15} op.cit
\textsuperscript{16} op.cit
claim is questionable. The irony is that the deterioration of its local community life could be one reason for its condition today - Kovalam has also deteriorated in quality and reputation as the best beach resort.\textsuperscript{17}

Tourism as a vehicle of development is not yet a convincing concept. Even though there are evidences of positive and negative contributions, generally it is seen that the socio-economic and cultural aspects as well as the environment and identity of individuals and the society is also at stake on par with the economic benefits. Though of late there are clear attempts from the Governments side to develop tourism on terms that help preserve the values, nevertheless in Kerala one is yet to see any such attempts being implemented and the result visual. So, at this point one can only state that the hypothesis that tourism development can coincide with a societies or communities prevailing value system, environment and cultural integrity and satisfy the needs of the local people is only theoretical.

An industry such as tourism is based on the assets and beauty of the land and the quality of life of the people in the area. These are of evolutionary character and were nourished and cherished by generations of local life, livelihood and life supporting systems - social, political and environmental. If so, then it is imperative that whatever business that bases itself on this must be sensitive to it, must not deplete it and must be able to enrich it so as to be sustainable. It must also be with the full participation of the local community in sharing the worth and the benefits. But tourism as is seen in Kovalam, is an example of an unjust trickle down system, with the last trickles being of least dignity. Though tourism provides some jobs for the locals, most of them are low paid jobs, which frustrate the local community. Many of them have shifted out of their traditional work and have to make the best from the tourist season, which usually lasts for a full three-four months (between November and February).

4.2 TRADITIONAL OCCUPATION IN KOVALAM

Kovalam has a long seashore of 8 km and traditionally fishing and farming has been giving the maximum employment. In the Vizhinjam area, which occupies the coast most people are dependent on fishing, while the mid lands and the higher stretches of the land, mostly in Venganoor area, we find farming being the major occupation of the people. Farmers are few in number but agricultural labourers form the major part of the employment in farming sector. While the many developmental activities and changes that Kerala has seen is also seen in this area, resulting in these traditional means of livelihood going through bad times, still these sectors are depended upon by the larger population for their income. A rapid assessment of the major sectors of employment is done here to set the stage for this study.

Fishing: The major occupation in the Vizhinjam Panchayath is Fishing and related activities including trade. More than 30% of the employed in the area are involved in fishing and 10% in the trade, a large number in the fish trade. The fish trade supports a number of women, while mostly men handle the fishing. But fishing is mostly a family centered system with men and women involved in various activities of the occupation. Vizhinjam is the largest fish trade centre in the Thiruvananthapuram District. When compared to other coastal areas, Vizhinjam is blessed with a natural harbour, ideal for fishing activities. Efforts are also going on to develop this harbour into an international port. Since the sea is relatively calm on the coast, there are efforts to develop the area for oceanographic research purposes also. The Panchayath Development Report itself declares that “given these conducive conditions of this area, we have not been able to fully exploit the wealth of the ocean”. As in all developmental projects of grand scale only time can say how much this would actually be beneficial to the local community and local economic development.

In the early days, fishing was a very traditional activity using catamarans, traditional wooden boats and nets made of cotton and coir. But now fishing has become mechanised with motored boats, boats using outboard engines and nylon nets etc. Only very few fisherfolk still use the traditional gear, more out of poverty and cost factors.

\textsuperscript{17} op.cit
There has been many attempts in the area to develop fishing sector, especially through modernisation. The Panchayath Development Reports describes some of them.

In 1948, Sri T.K Narayana Pillai, the then Travancore-Cochin Prime Minister inaugurated a fishing vessel “Chandrika” to help the traditional fishermen. This was one of the first ventures in Independent India. Later a storage centre where fish could be stored with salt was started in Vizhinjam. Then came a Boat building yard. These were employment generating ventures but did not operate for long. In 1958, an Ice-plant and Fishermen Training Centre was also established. Though they still exist, they have not been operating very well. Later, the first Pearl Oyster farm was started in Vizhinjam with good infrastructure, buildings and giving employment to a number of officials and workers. This Centre also closed down over time. Vizhinjam is known for its sea shells and pearl oyster trade and many work in this occupation, and this centre raised a lot of hope which was shattered mainly due to the lack of proper planning and administration. A Sea shell farm which was started also met with the same fate. After that there has been many schemes and industrial ventures that were started to help the sector. Some of them were the “Explorative Fishing” Project, Applied Nutrition Programme of the UNICEF, Matsyafed under the Fisheries Department etc. Most of these failed to help the sector, especially due to implementation issues, though they were conceived with good intentions.

In 1970, the Japan Government sponsored Yamaha outboard engine supply to the fishermen led to the first organized, planned and externally driven attempt to induce intensive exploitation of the seas by the traditional fishermen. Gradually this completely replaced the traditional methods of fishing. The Vizhinjam Panchayath has also earned the credit of using the largest number of outboard engine boats. The high investment for these engines and the additional cost of fuel for running these boats have contributed much to inducing debt and poverty among many fishermen families. A number of illegal brokerage and trade businesses have thrived on the demand of the fishermen for capital to invest. These businesses exploit the fishermen. The illiteracy that still prevails in the area also enhances chances of being exploited. Further the intensification of fishing, as is well known, has also caused a fall in fish catch resulting in added woes to the community.

The paradox of development in the Vizhinjam Panchayath cannot be better elaborated than with the growth of tourism in the Kovalam area. With tourism in the Kovalam area, the movement of fishermen to Vizhinjam has increased concentration and affected communal harmony. There is conflict which could be linked to resource sharing. Further worsening of the situation can be expected in the coming years as well, if the International port project comes through, especially if it is done without proper participation and inclusiveness of the local community. These projects will obviously need further displacements increasing competition for resources and livelihoods. When such projects come up the panchayath and the authorities should see how livelihoods that existed should not be affected. Most of the experience, whether it be in this area or elsewhere has been that such development always happen at the cost of the local communities livelihood and rights.

As per the available records, it is known that about 4000 people are employed in fishing as the main occupation. During the fishing season, many other fisherfolk from elsewhere also come to Vizhinjam, to make a living. An additional 2500 people find partial or secondary employment through this sector. More than 5000 people work in such support sectors like fish-trade, net-repairing, motor and boat repairing, fish processing etc. There is an estimated 700 mechanised boats and 300 traditional boats fitted with outboard engines. There are also many people who find employment in collecting and trading shells.

Fishing being the major occupation of the people of Vizhinjam, any activity which competes for resources in the area would only add more misery to the already poverty stricken community. Conflicts over resources and space leads to arson, and even deaths are not infrequent. The authorities while proposing such projects would have to not only perform the mandatory Environmental Impact assessments and the Socio-Economic Impacts assessments but would also need to perform a Sectoral impact assessment to find how the projects may influence the sectors like fishing or other traditional livelihood sectors. This is all the more important if these sectors are major employment providers as well.

Agriculture: The land in Vizhinjam and Venganoor Panchayath is a major life and livelihood supporting resource. In Vizhinjam, nearly 28% of the employed people are either farmers (7.51%) or
agricultural labourers (20.38%). Vizhinjam is a predominantly fishing village with 8 of its wards being occupied by fisherfolk and 4 of the wards partially, yet 70% of the land is agriculture land.

Venganoor Panchayath on the other hand is predominantly dependent on agriculture. 45% of the occupation are in the direct farming sector, with agriculture labourers forming 42%. The percentage of women agriculture workers is also relatively high in this panchayath.

The major crop in both these panchayaths is Paddy, Coconut, Vegetables, Banana, Tubers, Pepper etc. In the last 35 years major changes have happened to agriculture. Fertilizers and Pesticides applied unscientifically and intensively has deteriorated the quality of the soil and water thus harming the environment and health. There has been no substantial increase in productivity in the process. The major issues identified in the farming sector can be summarized as below

♦ Availability of Rice at cheaper cost from the neighbouring states, high cost of cultivation due to increasing cost of labour and inputs such as fertilizers and pesticides, water shortage etc have led to the drastic and almost complete wiping out of Rice cultivation in the area. Panchayath records show that in Vizhinjam where rice was cultivated in 20 Ha 15 years ago, only 5 Ha is being cultivated now. In Venganoor, which could be called a rice growing panchayath, the loss has been worse. From 200 Ha of paddy field spread in about 6 yelas, the area of cultivation has come down to 9-10 Ha. This has led to a variety of environmental problems including drinking water shortage, shortage of hay etc. But the worst hit is probably employment and the consequent migration of labour.

♦ The shortage of water is felt in almost all the areas of these two panchayaths. There is a tendency among the people to relate this to shortage in rainfall. But rainfall data available do not indicate any such phenomenon. It is clear that what is lost is our traditional ways of managing, storing and using water. Paddy fields and its connected systems of ponds, streams, bunds etc had a impact on the water conserved in the area and farming also influenced water conservation and usage. But when the criteria for farming shifts to cash, leaving food and water as secondary priorities, such disasters are to be expected.

♦ The various schemes of the Government supports farming of certain crops but the farmer is supported with only subsidies for implements, inputs and other infrastructure. The production cost of cultivation is high and when subsidies are later removed or reduced, the farmer would be forced to continue the same high-input farming methods. Moreover, the implements once it gets damaged need to be repaired and it also adds to the burden of the farmer. Panchayaths like Venganoor have also used funds to buy equipments like power tiller, which goes into disuse very soon. Even as the cost of production of crops increase, the farmers are forced into a dependence on the subsidies and the inputs like chemical fertilizers and pesticides. The truly discerning farmer who produces safe food for the society is also not respected. He/She does not have the market where the produce can be sold for a price that is profitable. The middlemen and the final sellers mostly take the profits. The increase in cost of production has also led to more and more farmers leaving the tradition and migrating to other jobs or even selling his land in search of greener pastures at the earliest. He also ensures that his children have nothing to do with tradition of agriculture and related livelihood.

♦ The use of chemical inputs, like fertilizers and pesticides have made farming costly as well as deadly. Fertilizers have made the soil lifeless and more and more of these chemicals are needed to maintain nutrition mix in the soil. So, is the use of pesticides, which increases each time and finally exceeds all limits of toxicity. The resultant disaster is an unhealthy farmer and his family and an unhealthy consumer who buys and consumes it.
Venganoor Panchayath has started a programme to revive agriculture and has put forward two concepts for the same – Organic Farming and Lease-land Farming.

In Organic Farming, the panchayath encourages farmers to produce vegetables and banana using organic methods. It has decided to make the panchayath a pesticide-free area. This is the first initiative of this kind in the State and is supported by Thanal as well as other agencies. The NHG movement of Kudumbasree has shown interest and many women farmers – small and marginal – have taken up Organic Farming. It is found that people are willing to pay higher price for such produces. There is also demand from hotels in the Kovalam beach area. An exclusive market for organic produce is also planned by the panchayath. The Organic Bazaar, a monthly initiative for alternate marketing of organic produce (a programme of Thanal) has helped a few farmers to bring their produce and sell it directly to the consumers. This not only helps them get a fair price but also helps build relationships between producers and consumers. The NHG’s like Keerthi of Muttakkad have benefited much from this experiment in marketing.

Another scheme that the panchayath has put forward is the Lease-land Farming at the NHG level. Kudumbasree SHG’s are encouraged to take on lease farmland and then start an organic farming venture. Subsidies from Kudumbasree and loan assistance from banks are provided. This scheme has evinced much interest among women’s groups.

While all these are welcome changes, some fundamental lacking is also observed. For farming to be a serious occupation, the people (women) who come to farming should have interest and stakes and should find this a value that they need to take up for themselves and for the future of their families. But even now it is seen that most of the new groups are only interested in the loans and subsidies and not in the actual farming.

An awareness and initiation on the fundamentals of farming as a livelihood need to be instilled before venturing out into these lines. Another danger of organic farming especially for the small and marginal farmers is that it could burden them with certifications, quality checks, marketing expenses etc. These should be handled without burdening the farmer. Developing local standards and establishing a participatory system of certification and monitoring would be interesting experiments that need to be tried at the local level.

Other Traditional Sectors: Both the Venganoor and Vizhinjam Panchayaths are not industrial centres and do not have any big industry of name. But these areas are traditional centres of important cottage industries. The major ones are the Coir making, concentrated in Vizhinjam and Kovalam areas, Handloom in the Mangalathukonam Kattachalkuzhi areas and a few in the Vizhinjam Panchayath as well. The Copra-processing industry near Oochakada is also an old industry. Of late, Stone quarrying and metal crushing are also considered traditional industries by the panchayaths, though by the strict definition they do not qualify to be so, neither do they have a long history. All these sectors, except the copra-processing industry is facing serious challenges.

Handloom: Handloom weaving is a major occupation of the people, especially in a few wards in Venganoor. Handloom weaving used to be traditionally done by men, but now many weavers are women. The master-weavers and experts in the field are all still men. The weavers are all fully dependent and at the mercy of the middle men. The Handloom cooperative societies are supposed to protect the interest of the weavers. The weavers depend on the societies for getting yarn and selling their products. Many of these societies are not “cooperative” and run like private companies of some individual and master weavers. Some of the master weavers while being good weavers themselves are also in the handloom trade and have set up their own production centres, employ weavers on a daily wages or piece rate and even run cooperative societies like their family business. While weavers were willing to talk about this very few actually complain because they get work from the societies. There is a lot of exploitation in these societies and stories of exploitation sometimes get raised in the gramasabhas.

An estimated 850 artisans are engaged in the handloom sector in the Venganoor Panchayath. Several of these weavers still use the traditional old type of Pit loom (Kuzhi tharies). The other looms in use are Shuttle looms and Stand looms. The looms here produce Balaramapuram handloom items. Only a small
number of weavers have their own looms. All the other work either under some trader/master-weaver or a society. The output per loom is less that one double dhoti per day, which fetches the weaver Rs. 45-50. The handloom sector is seriously threatened by the availability of low-cost power-loom products from Tamilnadu, the high cost of yarn and the low wages for the weavers. Many Balaramapuram items were reserved under the Handloom Reservation Act, and should not be produced in powerlooms. But this restriction was removed and the availability of cheaper power loom clothes have thrown many an artisan out of job. Absence of an efficient rebate policy, workers migrating to other sectors like construction which gives high wages, fake textiles that are marketed in the name of Balaramapuram handloom etc, have added to the problems of this sector in the panchayath. The Venganoor Panchayath has identified that the handloom sector need to be revamped and restructured. For this there is a proposal to convert pit looms to stand looms owned by groups of women. The panchayath also has plans to start yarn banks and marketing outlets under the Community Development Society.

Coir making: The Coir sector provides employment to more than 500 people in Kovalam, Thozhichal, Muttackad, Azhakulam areas in the two panchayaths. Local production of coir and coir-based products like ropes used to thrive in the area till quite recently (less than a decade). Today this industry is on a verge of a collapse. Many reasons are attributed to this. The use of plastic and synthetic substitutes for coir products, artisans migrating to other vocations like stone crushing are some of the reasons. The development of tourism in Kovalam has been detrimental to the coir industry, though the opposite was expected. Many of the husk decaying centres were located near the tourism sites and as husk retting created environmental issues and smell, it had to stop. Many of the artisans shifted to some small jobs in tourism sector. The coir sector employed many women. Now, the husk is exported to other coir areas like Kollam and Alappuzha. Small coir making artisans now face shortage of husk.

Stone Quarrying: Stone quarrying and Metal crushing became a major occupation in both the panchayaths, especially after the construction boom triggered by the Gulf boom and the tourism sector development. These workers are mostly women and the work is fully manual. The stones made available from the area are very much in demand for their quality. Permits are given to individuals to mine the stone from the rocks and the quarry’s do not have any license. Earlier hand drilling method was used but now jack hammer is used to break the stone.

This sector is unregulated. The informal sector provides no insurance coverage for the workers inspite of the fact that it is prone to accidents and health hazards. Tuberculosis and other respiratory diseases are common among the workers. Women and other workers have very poor working conditions and work out of the main roadside. They only use a small coconut leaf thatch to protect from the sun. Mechanization and the entry of big business groups in the State selling metal of sizes demanded by the construction company has reduced demand, but still women see this as a way of making some money whenever they need.

4.3 STATUS OF SECONDARY MATERIALS BUSINESS AND EMPLOYMENT

In the present system of waste management in towns and cities in the Country, the role of the informal sector – the rag pickers network, the secondary discards buyers and the resellers and the wholesale discards dealers are known but seldom recognized. The presence of this parallel system of waste collectors is an important factor in the collection system in the towns. This system is very deep rooted in our country – has grown up as market forces led demand and exists as such. In Thiruvananthapuram, Babu Ambat in his study estimated that there are about 500 rag pickers who are engaged in collecting non-biodegradable waste material having recycle/reuse value in the secondary market. The waste resellers contribute much to the recovery of resources – paper, iron scraps, plastic, bottles, broken glasses, rubber, bones, skin etc that mostly goes to Tamilnadu and Andhra Pradesh. They sell these wastes to the wholesale waste collectors who transport these materials to Salem, Coimbatore and other places for recycling and reuse. His assessment in Thiruvananthapuram City has revealed that 5800 kg of paper,
This labour intensive informal sector in the country is estimated to be providing employment opportunities to an estimated 1-2% of the workforce in large cities and is estimated to be picking up about 10% of the total waste produced in the cities.\textsuperscript{19} A good quantity of paper, scrap metals, cans, plastic and bottles get collected from households, establishments or from the dumps. This sector is driven primarily by market forces, and makes a significant contribution to the overall waste management in Indian cities. Formalizing this network, ensuring proper segregation and household level or ward level collection and streamlining the supply mechanism for the non-biodegradable waste would not only help recover resource to a great extent but would also be an enhanced economic activity for many such people. But the rag pickers work involves a lot of very dangerous activity and their financial conditions also do not seem to be good. Whereas, the secondary sellers and the wholesale waste dealers also work in very limited conditions, their financial status is not all that bad. Some of the wholesale waste dealers in the city of Thiruvananthapuram are financially well off and are industrialists in their own way. In this context, as a viable and already existing recovery system and as an opportunity for jobs in the system, it was important that we need to assess the performance of the non-organic discards collection and recovery network that is currently working in Thiruvananthapuram and Kovalam.

Recycling of the discarded materials is usually done to recover the basic raw materials from the product and to use the same for the manufacture of another product, which can then be brought back into the market. This is the nearest we can come to mimicking the natural system of cyclicity of resource use. But in practical terms there are a lot of problems one faces in recycling. In Kerala, materials that can be recycled/reused are collected by “akkri” (meaning the discards) buyers who are agents for the secondary wholesale dealers. These wholesale dealers collect and sell these items to recycling units in the adjoining states. Kerala does not have many recycling units, except for a few units that buy waste paper and cardboards, for making packaging cards and recycled paper and some glass reusing and remanufacturing units. Recycling in its strict form is also a highly positive economic activity as well as an environmentally beneficial activity as the feedstock to many manufacturing processes would be recyclables rather than virgin material. But this needs more care and planning in collection of the recyclable discards. Also products designed for recycling or remanufacturing can be very supportive for such a system. But recycling has a darker side. Most recycling is not actually re-cycling but down-cycling whereby the recovered materials would become feedstock for inferior products. This in effect does not serve the idea of a closed loop system of resource use and also supplies commodities mixed with toxic materials into the market. This problem needs to be addressed through better material use and production standards.

A Case of Discards Market in Thiruvananthapuram City: Thiruvananthapuram has a population of 8.26 lakh people living in 1.64 lakh houses. Apart from these there are nearly 1000 hotels, 54 hospitals, 40 markets and 36 slums housing nearly 36,000 people. The population density in the city is 11,000 / sq. km. The total waste generated in the city was estimated to be 265 tonnes per day.\textsuperscript{20} About 14% of this forms paper, plastics, glass and metal discards.

The scrap market (locally called “akkri” business) is well networked and has a good market for almost all durable, recyclable, reusable discards. The following materials are collected and sent for reuse or recycling by this well-established market.

\textit{Paper Scrap} : Three private firms control the entire scrap paper market in the city. Small-scale scrap traders at different levels and the rag pickers support their business. They buy almost all types of paper

\textsuperscript{18} Dr Babu Ambat, Solid Waste Management –Preparation of an Action Plan and establishment of an environmental information system for Thiruvananthapuram City, 1999

\textsuperscript{19} Reyer Gerlagh et al, Integrated Modeling of Solid Waste in India, CREED Working Paper No 26, March 1999

\textsuperscript{20} Jessy M. Joseph, A Municipal Solid Waste Management System for Thiruvananthapuram City, 1993, University of Kerala
discards. They sort the paper discards collected into reusable and recyclable. The reusable are channeled back to the market. They deal with old newspapers, magazines, notebook papers, cutting waste from the printing press, card board, paper boards and files etc. But they don’t take laminated paper even if the film of plastic is very thin. On an average 18 tonnes of card board and 8 tonnes of other papers per day are being redirected to the paper mills where it gets recycled. All the major recyclers are from out side the State. Papers also go to Newsprint factories and Paper board manufacturing industries in Tamil Nadu or Karnataka. Of late paper is being purchased by the Hindustan Newsprint Limited, a Public Sector factory in Kottayam, after the commissioning of their deinking plant.

The paper recovery market had a huge employment potential. One person who has about 60 years experience in this field recollected that 15 years ago they used to sell about 300kgs of paper covers made from old newspapers. There were about 50 women who worked in their shop for making this paper bags. But the introduction of plastic carry bags and other types of bags put an end to this business. While plastic covers have polluted our towns and cities with garbage, it has also destroyed many jobs in the paper recycling business. This experienced dealer now deals with about 4 tonnes of card boards and 7 tonnes of other papers daily. Today his annual turnover is about Rs. 75,00,000 and he pays off Rs. 3,00,000 as Sales tax to the Government annually. He employs 6 persons in his shop but he vouches that there are at least 70 people under his network who works independently and earns an average of Rs.36,500 per annum which is a rather decent earning. He revealed that his major clients are Bhadrachalam Paper mills in Andhra Pradesh and Nelson Paper mills in Tamil Nadu. He revealed that a major media group in Tamil Nadu which publishes 8 publications have their own newsprint factory-Sun Paper mills, Tirunelveli District, Tamil Nadu. He revealed that a number of paper recycling factories are coming up and the demand for scrap paper is increasing. Some times he purchases paper scrap in bulk from other wholesalers in the neighbouring districts to meet the demand.

Plastic Scrap: About 10 Tonnes of plastic scrap is being sold every day to the recycling markets from Thiruvananthapuram. The markets are spread over Tamil Nadu, Andhra Pradesh and Karnataka. The plastic discards collected here even goes to Delhi for getting recycled. There are 3 wholesalers in the scrap market of plastics in the city. While they generally do not buy carry bags and PET bottles, one of them revealed that there is recycle market for the carry bags and pet bottles. But the margin from the sale of these materials is too small and the effort is too big. That is why the ragpickers avoid these disposable items. They don’t collect plastics which have high clay content. (electric switches for example) They collect almost all the other plastic materials and plastic gunny bags. They sort this depending on the market, grinds it and sends it to the market. Most recycled products are of inferior quality. The major products are buckets, mug, pots, and other small utility products. It is known that plastics cannot be recycled for more than 2-3 times. The plastic dealer interviewed refused to divulge his financial details. But from the inferences made from the quantity dealt with and the market price it comes it was found that he does business worth Rs. 3,00,000 every year.

Metal Scrap: The metal scrap market is dealing with about 20 Tonnes of metals every day. The metals are sorted into tin, iron, aluminum, copper etc. The scrap metals are sold mainly to Madhurai and Coimbatore where a lot of metal recycling industries are located. Recently when the Tamil Nadu Pollution Control Board took steps to implement pollution control norms in this region it invited wider protest from small scale industries which are engaged in smelting of metals. These industries are polluting the environment of the region and consume energy heavily. The people who are engaged in this business also hesitated to reveal the money flow in their business.

Glass Scrap: Glass bottles which are in good condition are being sent to the Breweries located in Bangalore, Karnataka for reuse. Glass pieces are going to the recycling factories located in Hyderabad in the State of Andhra Pradesh. About 45 tonnes of glass is being sent from the market to out side of the city daily. There is a factory in Alappuzha District of Kerala which recycles glass.

Building materials: The second sales of old building materials from the demolished buildings started in the city about 6 years back. Now many people are attracted towards this business. The people engaged in the business buys the house which is to be demolished. Then they take apart each part very carefully.
These are bricks, furniture, roofing materials, iron rods from the concrete etc. Doors and windows are the main articles, which have great demand. Now they have started re-manufacturing furniture to add value to the old wood. They utilize about 80% of the building that is demolished.

**A Case of a Discards Reseller in Kovalam**: Nazar has his shop in Mukkola Junction in Vizhinjam and has been in this business for the last 17 years. He collects glass bottles of beer and other beverages. The glass bottles are sold to Bangalore for re-use in beverages industry. He sends them through an agent in Kollam. During the tourist season he sends a truck load of glass bottles on a monthly basis. Off-season, it will take three months to get one truck load of glass bottles. In the last 4 years he has noted the increase in the use of plastic bottles. He says that even beverages now come in plastic bottles.

These are the discards Nazar collects mostly from the tourist village.

**TABLE 7:**

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Processing</th>
<th>Use</th>
<th>Place to which sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Glass bottles- all beverage bottles</td>
<td>Removes aluminium caps before packing: No washing or cleaning</td>
<td>Re uses for filling beverage</td>
<td>Bangalore</td>
</tr>
<tr>
<td>2.</td>
<td>Broken glass pieces. Includes tubelights and bulbs</td>
<td>Recycling in the glass factory</td>
<td></td>
<td>Alappuzha</td>
</tr>
<tr>
<td>3.</td>
<td>Card board boxes</td>
<td>Segregates reusable and non reusables</td>
<td>Re uses for packing medicines Recycles for making paper</td>
<td>Santhigiri Ashram Pothencode Brymore near Kulathupuzha</td>
</tr>
<tr>
<td>4.</td>
<td>Aluminium bottles and caps</td>
<td>Recycling in the same industry</td>
<td></td>
<td>Madhurai</td>
</tr>
<tr>
<td>5.</td>
<td>Iron and tin- includes spray bottles, bisket tins, pieces of metals, pesticide spray bottles etc.</td>
<td>Recycling in the same industry</td>
<td></td>
<td>Madhurai</td>
</tr>
<tr>
<td>6.</td>
<td>Plastics. Includes, tubes of tooth paste, bottles of lotion or creams, chapals, pieces of buckets, thick plastic bottles etc.</td>
<td>Avoids disposable plastic cups, plates, carry bags, Pet bottles</td>
<td>Recycling in the plastic industry</td>
<td>Madhurai</td>
</tr>
</tbody>
</table>

Nazar has to pay for the glass bottles collected from hotels. He also pays for card board boxes and metal pieces. But he does not collect news papers or other types of papers. He has one worker to assist in this business. He collects materials and stores in a place, 2 kms away from the beach. All the sorting and segregation is done there. He would much like to sell glass bottles after cleaning, as it would earn
him more income, but shortage of water prevents him from doing this.

These two case studies are brought in here to bring out the potential of setting up a well-organised Resource Recovery Facility in the area. But this must be done in such a way that it does not hurt the present system but rather streamlines as much of these discards as possible to such established businesses. The experience in IHMCT has shown that each year discards, which were otherwise burnt, were recovered and sold to the scarp dealer in the locality for Rs. 12,000 in one year. Such system not only recovers resources from discards but also supports the local scrap dealers, with additional business.

4.4 EMPLOYMENT IN KOVALAM – A GENDER PERSPECTIVE

It is well researched and evidenced that women participation in the labour force, especially paid employment, raises the quality of life not only at the level of household but also for society at large. The major occupation of the village of Kovalam was based on coconut, fishing, processing coconuts for coir, oil etc and trading of these products and fish. Most of these gave women participation in the production of family income, even though this cannot be considered as paid employment in the literal sense. Yet, the pre-occupation and the security that this provided were significant.

Currently, women in Kerala are almost at parity with men regarding education - 86.2 per cent literate in 1991 compared to 93.6 per cent for men and with comparable enrollment rates in secondary schools. The labour force participation in Kerala is one of the lowest (31 per cent) in the country. If we take into consideration all workers (main and marginal), the female work participation rate in Kerala is 15.85 per cent in 1991. On the contrary, the male work participation rate is 47.58 per cent during the in 1991. In the Vizhinjam Panchayath the Female work participation is an abysmal low of 12.51% while in Venganoor it was as high as 35%. In Kerala it has been found that there is a problem of economic marginalisation of women in Kerala’s development process. This is due to various reasons, but the disparity is evident and so is the fact that the conditions which creates the disparity not only continues to exist but is enlarged by the change in priorities of development. For example is the growth of the Tourism sector.

The Tourism Policy of India have always talked about the environment and generating employment and opportunities for women. But studies have shown that places like Kovalam do not reflect the intent of the policy but are diametrically opposite to it.

In Kovalam, during the initial stages of the Zero Waste Kovalam project, we found that women who were much willing to be trained for work such as coconut shell craft, paper and cloth bag making etc were against coming down to the beach area where one of the training was organised. On enquiry we found that many of these women who were sometimes living only a hundred metres from the beach had not gone down to the beach even once in their lives. Our exploration revealed some interesting dimensions to the impacts of tourism to local women’s lives. This could be considered one of the classical examples of women losing their right to land and access to common property and resources because of the sheer density and intensity of tourism in most centres which do not allow for an equitable distribution and/or enjoyment of resources. It is seen like in many experiences all over the world, especially in the Third world countries that the control over these resources very quickly goes out of the local community and they (the community) become aliens in their own backyard.

21 Pradeep Kumar Panda, Poverty and young women’s employment: Linkages in Kerala, Centre for Development Studies, Thiruvananthapuram, February 1999

22 op. cit

23 Shirley Susan and Anand Bala, The Unseen Host, Eq-NF, Volume V Issue I March 1999, Equations
In Kovalam, especially in the beach area and the immediate backyards, one can see that there is very little land left for any sort of community activity; all the available land and now even homes are converted to develop accommodation and infrastructure to suit the needs of the visitor. Much of the land that used to support traditional livelihood for the local population, especially women are no more accessible nor usable for this purpose. Even as these traditional occupations are threatened, the tourism sectors do not provide women with the kind of jobs that they would be comfortable doing. Unlike other states in India, household and non-household industry absorbs a large proportion of female workers in Kerala. This is largely attributed to the existence of traditional household industries like Coir, Cashew, Bamboo, Reed and other fibres and as a recent phenomenon the handloom sector.

**TABLE 8 : PARTICIPATION OF WOMEN IN EMPLOYMENT – SECTOR WISE (VIZHINJAM PANCHAYATHI)**

<table>
<thead>
<tr>
<th>Employment</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Women participation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>867</td>
<td>55</td>
<td>922</td>
<td>5.9</td>
</tr>
<tr>
<td>Agri: labourers</td>
<td>2204</td>
<td>294</td>
<td>2498</td>
<td>11.8</td>
</tr>
<tr>
<td>Animal husbandry / fishing</td>
<td>4481</td>
<td>14</td>
<td>4495</td>
<td>0.3</td>
</tr>
<tr>
<td>Stone crushing</td>
<td>13</td>
<td>14</td>
<td>27</td>
<td>51.9</td>
</tr>
<tr>
<td>Cottage Industry</td>
<td>171</td>
<td>105</td>
<td>276</td>
<td>38</td>
</tr>
<tr>
<td>Non-Cottage Industry</td>
<td>490</td>
<td>194</td>
<td>684</td>
<td>28.4</td>
</tr>
<tr>
<td>Construction workers</td>
<td>278</td>
<td>18</td>
<td>296</td>
<td>6.1</td>
</tr>
<tr>
<td>Trade, Industry</td>
<td>907</td>
<td>406</td>
<td>1313</td>
<td>30.9</td>
</tr>
<tr>
<td>Transportation/communication</td>
<td>328</td>
<td>19</td>
<td>347</td>
<td>5.5</td>
</tr>
<tr>
<td>Govt. service and other service</td>
<td>988</td>
<td>415</td>
<td>1403</td>
<td>29.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10727</td>
<td>1534</td>
<td>12261</td>
<td>12.5</td>
</tr>
</tbody>
</table>

**TABLE 9 : PARTICIPATION OF WOMEN IN EMPLOYMENT SECTOR-WISE (VENGANOOR PANCHAYATHI)**

<table>
<thead>
<tr>
<th>Employment</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Women Participation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>187</td>
<td>29</td>
<td>216</td>
<td>13.4</td>
</tr>
<tr>
<td>Agri: labourers</td>
<td>1978</td>
<td>1046</td>
<td>3024</td>
<td>34.6</td>
</tr>
<tr>
<td>Animal husbandry / fishing</td>
<td>451</td>
<td>125</td>
<td>576</td>
<td>21.7</td>
</tr>
<tr>
<td>Stone crushing</td>
<td>186</td>
<td>174</td>
<td>360</td>
<td>48.3</td>
</tr>
<tr>
<td>Cottage Industry</td>
<td>348</td>
<td>516</td>
<td>864</td>
<td>59.7</td>
</tr>
</tbody>
</table>
The table shows that in both the Venganoor and Vizhinjam Panchayath the cottage industry sector happens to employ the maximum percentage of women. The stone crushing sector also gives employment to women but this sector has been detrimental to the health of the women workers. In this area, the participation of women in agriculture sector is not found to be substantial. In Vizhinjam, the fisheries sector is completely dominated by men and the women have the presence in trade and commerce, meaning in the marketing of fish.

Very little is known of the changes in the 10 years, but two important changes in these years have been the Poverty Alleviation Mission – Kudumbasree and the growth of the Tourism sector in the area. The Kudumbasree movement and the effort to promote micro-enterprises as livelihoods must have increased employment participation, but to what extent remains to be assessed. But most of the occupation provided for the women by the fast growing tourism sector in Kovalam is at the bottom end of the ladder for washing clothes, dishes and as sweepers and maids. This is a rather unhealthy trend and the jobs are mostly available only during the season. The women have no control over the sector in terms of its growth, its impacts and decision-making. Again, the demand in the urban sector, triggered by the wasteful culture has led to women (especially from the Kudumbasree Units) to take up even waste collection and disposal as an opportunity. While the Kudumbasree is a movement to empower women, pushing them to take up such jobs as an opportunity have drawn serious criticism among many women groups.

The matter of gender in employment – gender bias, unequal wages, unequal conditions of work, reserving some work, such as those needing roles that women are fixed into such as nursing, cleaning etc are some of the issues that need analysis.

Gender and Tourism is also an issue, which is not addressed in research and planning. In a gendered society like India, where human relations in economic, social and cultural life, as well as in the political framework are determined and mediated by gendered perceptions, it is recognized that Tourism (and such other growing sectors) is an activity which has much influence and can be influenced in turn by local and global gender perspectives. While the tourism industry that grew up in areas like Kovalam in an unregulated environment could lobby for policy changes and force its way into the land and lives of the people (read women) the weak and dependent population (again read women) have been marginalized and alienated from decision making including policy. Such a trade centred policy, even if there is a trickling benefit to women completely lack a gender perspective. The social, economic and political impact of such a tourism policy (or the lack of it, as is the case of the growth of Kovalam) on the women needs to be seriously and immediately addressed, for equity and justice to be delivered.

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4.5 ANALYSIS

From what is discussed in this chapter, it is clear that the Kovalam area has a richness of its own dependent much on the natural resources in the area, as well as the traditional skills. Families still have not been able to gain the benefits of the major developments introduced as the possible harbingers of progress and livelihood supplier. But they are not protesting because there is hope and also because the traditional sectors are no more viable, with the falling support for these sectors as well as the new generation moving away from it.

But it is also seen that the growing sectors such a tourism and even the much celebrated and expected harbour project may not give the local community sustainable opportunities. As is evidenced in the Tourism Sector, it may even be inducing disadvantages. It is seen that while proposing development, there is still a top-down approach combined with a complete lack of understanding of the local community as to what exactly they need and how. So, when the Government or the really interested say that a large harbour project is needed for the development of the area, the common people do not reflect it with their needs and they feel that ultimately some benefit may trickle down with the project. It is seen that there is an inability in the powers that be to understand the kind of impact that such development project or such growing sectors as tourism has on the lives of the local community, youth and women. There is also a need to introduce a gender perspective in the development policy and specifically the tourism policy. If these issues are not seen from the local perspectives at the same time keeping the ultimate yardstick – the resources and the life supporting systems of water, land, air, as the basis, these issues cannot be understood, let alone tackled. This needs a policy level intervention in a proactive and visionary manner rather than a reactionary manner. Ultimately the community needs must take priority over the need to bring more foreign exchanges or develop infrastructure with the hope that it would be attractive for the foreigners. In any development, the founding principles should be that the main beneficiaries should be the women and the marginalized people. We need to have a system of development – the decentralised system that does not induce displacement, resource wastage, destructive investments and demoralisation in culture and values.

The Zero Waste approach is a total and holistic approach to rejuvenating societies to think about development with the real values of life support systems, resources and the skills, aspirations, diversity, culture and improvement of life of the families as the basis of thought and planning. Children, Women and other marginalized or even more specifically the underprivileged ( in the conventional rat-race) would be the centres of developmental thought and planning.

The Zero Waste takes waste as the starting point but spreads into areas connected with this problem and addresses solutions through the building of relationships and communities.
CHAPTER 5
CREATING EMPLOYMENT FROM WASTE – A ZERO WASTE APPROACH

Employment means being engaged and being able to sustain oneself and one’s family in the process. Employment must provide work, products and services needed at the local and regional levels and must be enjoyable. Employment is also related to the skills and the interest one possesses. It has been observed by many in social research that while modern employment has provided jobs to people, there has been a marked deterioration in their skills. The loss of skill undermines the human quality of creativity, which also needs to be revived. Employment is also dependent on the resource available, especially locally available resources. Employment must also provide for a healthy society. Hazardous employment damages health and the environment. Such an understanding of employment is fundamental to ensure its sustainability, and hence has been the basis of developing employment generation as an important component of the Zero Waste Kovalam programme.

The relation between waste and employment has been rather unobtrusive. Waste is resource, which has been misplaced and hence discarded. We always want to dispose of our waste and all technologies and efforts by individuals, families and governments are to dispose of this waste. Waste is created when you do not work, i.e. when there is inefficiency. Zero Waste means that there should not be waste. Waste is the visible face of inefficiency. An efficient system should have movement of material. Material would be consumed, material would change form, and material would become discards. And a responsible community and one which is sustainable, material use should be efficiently optimised, which means even the discards should be used.

Zero Waste Kovalam - is an initiative to manage waste in the most progressive way, to invent jobs and profits in the process and pave way for a community development that is based on principles of resource conservation and maintaining ecological balance. In simple terms, Zero Waste intends to create a community, which do not waste resources. But one question remains - where do the jobs and profits come here? For this let us look at the waste that is generated and the form of materials that is generating this waste.

In a typical municipal waste stream like in Kovalam, we have a large bulk of bio-discards, which is food waste, vegetable waste, fish and meat waste etc mostly from households or hotels. Earlier this discards had gone to the farms in this region, either directly as manure or after composting. But gradually, the waste stream became mixed with non-biodegradables like plastics and toxic substances like tubes, medicines, batteries, plastic bottles etc. This spoiled the resource that bio-degradable discards were and today we have a major problem, because of this mixed waste. The solution that is propounded for handling waste is to first SEGREGATE.

When the discards at source is segregated before it reaches the bin, then the bio-degradable waste is a resource which can produce bio-gas for cooking or compost for fertilizing the land. This is an employment opportunity – managing these discards and selling products like bio-gas and/or compost. Both bio-gas and manure have an ensured market, which is growing and demanding, especially if we could add in some innovative quality enhancement and also link it to the right markets like organic farms etc.

The next major component in the waste stream is the non-biodegradable or partially degradable but recoverable discards. These are paper, metals, leather, cloth etc. Such discards in the segregation system can be collected, separately stored and sold to secondary markets. In the Zero Waste system, the resource recovery is a huge employment opportunity. Establishing Resource Recovery Facilities, as enterprises are solutions to these issues as well as a source of jobs.

Today’s waste stream also has a lot of toxic components in it. In Kerala, the largest visible waste, which spoils all other discards and is a headache for the local self-governments, is plastics. Most of the plastics used are extremely toxic chemicals like Poly-vinyl chloride. Plastic items are the most discarded materials and the waste remains without degradation for millions of years. How can we manage plastic? One cannot burn it, as it will produce highly toxic gases. Neither can it be buried, as it will destroy
the fertility of the soil and contaminate the water. It can be recycled, but the products that are made out of recycling is mostly down cycled, inferior and more toxic products. And all these methods are also very costly in one way or the other, as they are either highly energy intensive or resource wasting.

A more sensible way, which also gives immense employment opportunity is product substitution – shifting to more sustainable, eco-friendly products. Many of the plastic products like carry bags, bottles, cups, packaging material, many household products, hotels and kitchen utensils etc can be fully substituted by eco-friendly products made from bamboo, coconut shell, leaves, waste paper, cloths (tailor waste and fresh), jute, palm sheath, banana fibre, screw pine, mud etc. This not only uses locally available resources, but also is an excellent employment opportunity, especially as there is an assured market in a place like Kovalam, with its tourism potential.

In Kovalam, as seen in the earlier chapter, the growth of tourism in the area has decreased jobs, especially in the traditional sector. Skills and access to resources have been compromised, especially for women and one can say without doubt that women have been kept away from the newer development and job opportunity in the area. It is hence important that women should be brought to the mainstream, through empowerment and dignity. They need to have control over their lives and family and be partners in social, political and economic decision-making and policy-making processes. Opening up ways for sustainable employment and income generation can only be a starting point. Many of the women who now associate with the programme recollect that they have never seen the beach even though they were living at a distance of a 10 minute walk from the beach. The Zero Waste programme has been able to bring women in large numbers for the awareness and training programs and partner in the sharing of knowledge and skills of age old traditional environmental friendly ways of living. Such knowledge could be used to replace plastics with other better materials and so could it be used to build up a different way of life and development, a more sustainable one. This is intended to serve as a platform for their development, their participation and the rebuilding of the society.

At the Zero Waste Centre, setup as part of the programme, the focus is on training and capacity building. There is a process and facility for continuous up gradation of skills, products and design development. The women are also empowered to start their own family/cottage/neighborhood-based units. Moreover the emphasis is on local economic development through building capabilities, self-confidence and strengthening family/neighborhood based employment opportunities.

Zero Waste also offers some other potential employment opportunities. Recycling and manufacturing paper and products from waste paper, Poison free agriculture and fully natural vegetables and food, Discards management through resource parks are some of them. Water shed management and rain water harvesting and such basic resource conservation activities could be engaged into the Zero Waste programme. This research project attempts to document, analyse and take stock of these opportunities and look at ways to increase them. In a very conservative estimate itself, both at the micro level in a locality or at a regional level, Zero Waste is expected to produce a lot of employment opportunities.

Another critical component of zero waste is developing the market for these products through awareness programmes, campaigns and marketing methods that can be adopted by small and micro-enterprises and run by rural women. Many institutions and individuals have evinced interest and showered their support by purchasing products made up of locally grown renewable materials and patronizing manufacturers of recycled content products. The buyers realise that this change in purchase policy and materials use policy reduces waste while saving money. These actions can increase employee morale, community involvement, creativity and customer service. While on one side the buyers can show case and promote their program and successes to their customers and friends, on the other side it would have provided dignified livelihood opportunities for local community. Such an approach is attempted in the programme.
5.1 EMPLOYMENT IN DISCARTS MANAGEMENT

Waste, especially in an urban context has always been a major employment provider. It is estimated that in India over a million people find employment through waste. Rag pickers, Secondary waste dealers and recycling industry, municipal waste workers, door-to-door waste collectors etc are some of them. These may either be in the organized sector or in the informal sector. Most of these organised and informal sector work on very frugal and subsistence terms and hence the health and well being of these workers are mostly compromised. It is in this context that discards management as an option of employment needs to be reviewed. Here, handling waste must not make the employed a hapless victim of the irresponsible behaviour of the waste producers. Even as the present informal systems need to be incorporated and formalised with safety and security built in, there must be value additions done not only to the process but to the products and services that come out of handling discards.

Resource Recovery Programmes:

The Resource Recovery Programme of ZWK had two focuses – to handle the discards at the individual/institutional level and at the cluster level for a group of institutions/individuals. But the schemes that were to come up would have to be owned and operated by the respective stakeholders rather than the Government or the NGO that proposed the programme. Eventually, the campaign and awareness generation programmes and the continuous interaction with the hotels/restaurants through the Kovalam Unit of the Kerala Hotels and Restaurants Association took more time than the actual installation and running. At the “Towards Zero Waste Kovalam” skill share organised in November 2001, the KHRA decided to support the efforts of Thanal to solve the waste issue, but Thanal was sure that it cannot be an implementing-from-the-top type of programme, and that any solution should come from the stake holders. The KHRA members were the waste producers and only they should be able to solve the problem. Technical support and know-how as well as monitoring and other support could be given.

It was found that the Vizhinjam Panchayath was spending a huge amount of money each year for waste management. For example in 1999-2000, the Budget of the Vizhinjam Panchayath showed that Rs. 27,55,000 was spend only on matters related to waste management. And most of these were activities done in the Kovalam area comprising of Ward 1-Kovalam Ward and parts of other wards. The total income of the Panchayath for that year was Rs. 83.82 lakhs. The practice has been to grant the Panchayath with an additional amount for every year by the Tourism Department (that year it was Rs. 25 lakhs). The operation followed was to do cleaning and sweeping and to collect the waste and dump in on roadsides or any other place possible.

This system was a totally unsatisfactory system and moreover was being misused. This even led to the State Ombudsman intervening in the issue.

It was almost at the same time that the Zero Waste Kovalam programme was proposed. A survey was also organised to assess the attitude and opinion of the business establishments towards waste and its handling. The results of the survey showed that 61% of the establishments did not follow any segregation while 39% did have a rudimentary segregation done, basically to collect and sell off some of the recoverable matter that had some market value. 89% of the establishment owners felt that burning of waste should not be done and 100% opined that dumping should be stopped. It was found that 46% of the establishments were run by their owners and had a stronger stake in the process while 54% were on lease. 54% of the establishments were found to have their own land to manage their waste, while the rest had little land and has to depend on other means.
TABLE 10:

<table>
<thead>
<tr>
<th>Agency responsible for waste management according to establishment owners</th>
<th>% of establishment owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>14</td>
</tr>
<tr>
<td>Dept of Tourism</td>
<td>10.4</td>
</tr>
<tr>
<td>Dept. of Tourism and Panchayath</td>
<td>14</td>
</tr>
<tr>
<td>Hotel and Restaurants Assn.</td>
<td>5.8</td>
</tr>
<tr>
<td>Local People</td>
<td>4</td>
</tr>
<tr>
<td>Panchayath</td>
<td>35.3</td>
</tr>
<tr>
<td>Shop Keepers</td>
<td>6.9</td>
</tr>
</tbody>
</table>

When asked as to who according to them is the authority who are responsible for waste management in Kovalam, interesting data was revealed. The establishment owners found 15 types of agencies/authorities/groups/individuals or its combinations who are responsible for waste management.

We also conducted a survey among the shopkeepers to assess their attitudes to waste management and to record their opinion on the same. This was an open-ended interview based on an unstructured questionnaire with no prompts but questions ranged about the following

- Attitude to waste management
- Complaints
- Current Waste Management Practices
- General Observations
- Problems
- Solutions
- Zero waste Solutions

The complete list of then opinions of the establishment owners is in Annexure. With these information on hand, action plans for handling discards was developed.

**Biodegradable Discards**: The survey done before the skill share revealed that hotels, restaurants, petty shops, bakeries, provision stores, general stores and coconut vendors in Kovalam together generate about 6.7 tonnes of bio-degradable waste every day during the peak season. Of this 4 tonnes of bio-discards are from more than 100 hotels and restaurants. Biogasification (Biomethanation or anaerobic digestion) was proposed and accepted as the most possible option for handling the bio-discards in Kovalam. Subsequently, a feasibility study was also done, with a more accurate quantification of the waste and its composition. Detailed enquiries were done regarding biogas plants. The biogas plants running
at Seaface Hotel, the ITDC and the IHMCT, Samudhra Beach Kovalam were studied. Plants in other places including the prototype models at the Vivekananda Centre, Kanyakumari was also studied. The Dheenabandhu model biogas plant, which is running smoothly at the Sea face Hotel was found to be a more cost-effective and traditional model. The action plan for handling biodegradable discards had the following

**Segregation** – Proper segregation of this bio-discard is fundamental to handling the waste issue. The success of a biogas plant will fully depend on the proper implementation of segregation, and it being taken up as a practice and habit in the hotels, restaurants and other establishments. A two-bin segregation scheme was suggested - one for the bio-discards and the other for the rest of the discards, both recyclables and the non-recyclables.

**Awareness and Training** – Hotels, Restaurants and other establishments need to be given awareness classes and training sessions for both their managerial staff as well as the operational staff, with specific focus on the staff in the kitchen and cleaning work. This should be done with the active participation of the KHRA. It was also felt that segregation and clean management practices of discards need to be incorporated as part of the accreditation schemes of the Tourism Department as well as the KHRA.

**Establishment of the bio-gas plant/plants** – Regarding establishment of biogas plants, various options have been proposed. The KHRA / a society formed for the very purpose can set up a cluster bio-gas facility, the regulated bio-discard can then be taken over to this facility to produce gas /electricity. The Venganoor/Vizhinjam Panchayaths can also put up a bio-gas facility owned by the panchayath or self-help group/groups and the bio-gas/electricity generated can be used by them for some mini-industrial activity that they can plan, on a symbiotic basis along with this plant, or sold to some hotels. Alternatively, the SHG’s can also take up the running of the plant for the hotels/restaurants. These options could be taken as individual systems or in combinations.

**Non-Biodegradable Discards:** In Kovalam about 6000 drinking water bottles (PET bottles), mostly in crushed and unusable form, about 1500 plastic carry bags, nearly 3000 plastic milk sachets, about 750 plastic cups are ending up as discards in streams, burnt in the open and dumped in the bushes, the beach and the sea. The menace that plastic can cause to human health and environment is very much evident here. One can say that the tourism industry has much to loose, if immediate and concerted action in not taken against this menace. Apart from plastic, there are glass, metal tins and parts, cardboard boxes, cloths, cotton etc which are discarded in Kovalam every day. Many of these materials have a very good reuse market value, especially glass bottles, some plastic bottles, cardboard cartons, metal items etc and should be sent to the secondary selling market, which thrives in the city of Thiruvananthapuram (read the section on recycling industry in earlier chapter). A large part of these discards can be recycled. But identifying the recyclable from the non-recyclable is a question of technicality and one needs to be an expert or there must be a number code which identifies the type of the plastic material – as LDPE, HDPE, PVC, PS, PETE etc. But the clearly better option is to reduce the use and disposal of these materials as much as possible.

A third category of disposable plastic items, mostly the drinking water bottles (which the manufacturer forces to “Crush after Use”), the Plastic Carry Bags, tetra pack and other plastic coated plates and the Plastic Cups can neither be reused nor recycled and hence need to be totally phased out from use. Sustainable substitutes to these must be introduced, preferably with materials that are locally available, like paper bags, plates and cups from leaves like palmyra, banana etc, coconut shells and paper. Bags made from cloth, tailor waste, paper, coir, jute should be good substitutes for the plastic materials that are to phased out. Alternate good water supply options also need to be explored. The following action plans were decided upon for handling the non-biodegradable discards

**Resource Recovery Park** – A Resource Recovery Park is in simple terms a centre where all the non-
biodegradables can be brought in, separated into the reusables, recyclables, remanufacturables, repairables and can be redirected to those agencies which would use/recycle them. This may sound similar to the secondary seller, but is a more planned and organized extension of the same, as the RRP also acts as a local and direct repository of materials that have been used but cleaned up and ready for reuse. The primary purpose of an RRP would be to recover resource to the maximum. The RRP can be setup by any agency, who may be interested in this. Self-Help Groups in the panchayaths can also set this up and run it on a profit. The Venganoor Panchayath has come up with one such proposal to setup the park at the Vellar Ward and have included the stake holders contribution in their 10th five year plan. This opens a good employment opportunity.

**Awareness and Training** - Awareness on the use and hazards of plastic need to be imparted to the local community, hotels, restaurants and establishments. Training on use reduction, material handling, setting up RRP etc also need to be done. A Proper two-bin Segregation and Collection system has been designed to lead all the discarded non-biodegradable materials to the Resource Recovery Park (RRP) . Proper planning of the collection and redirection mechanism would help much in making it a viable and profit-making center apart from recovering precious resources.

**Awareness and Campaign for Zero Waste** – Sustainable Tourism is so much dependent on the materials use and ethical conduct of the tourist and the hosts as much as on other factors. Both the Tourist and the Hosts must be made aware of the potential threats posed by the use of polluting materials, like plastic drinking water bottles, plastic carry bags, plastic cups and other toxic materials. Tourist, both domestic and foreign must be instructed to respect the right of the local community to keep their locality neat and unpolluted. The “Zero Waste Kovalam” can go as an icon, that tells the tourist from all over the world this message. It is imperative that the Tourism Department, the travel agencies, the tourism promotion agencies, hotels, restaurants and other establishments, the local panchayaths and other stakeholders participate and supplement this process. A well-planned awareness and campaign programme through media, posters, banners, exhibitions, roadside displays, sign-boards, pamphlets, conduct guides, need to be implemented with the help of newspapers, information desks, websites, road shows, travel marts, travel brochures of Government and private agencies and hotel room instructions etc.

**Phase-out Disposable-Plastic Use** – The use of Disposable-type plastic material need to be phased out, as it has been identified in the Stake Holders meeting as the one creating the maximum nuisance to Kovalam. This will include Plastic carry bags, plastic water bottles and plastic drinking cups. The Materials substitution programme will help women and youth to produce these materials and supply them at Kovalam.

**Periodical Clean up:** Historically waste has been dumped or burned in the beaches and the streams and other water bodies. There are more than 100 waste dump sites all over the three beaches and its surroundings. More over there are a number of waste dumps out side the tourism region within 3 km radius. Among three beaches the area behind the Light house beach is badly affected by the waste dumping. The kitchen waste from the restaurants was being dumped in the backyard of Light house beach. During the daytime the garbage, which is stored in plastic covers or sacks, begins to stink and when it is dumped in the night one can imagine what it would be like. There is a common practice to dump waste in the streams and paddy fields. People even built up concrete rings to dump and burn waste. Plastic bottles, which have been collected in the waste bins are scattered all around the region. Burning of waste is the common practice to reduce the volume of waste. Since the waste is not segregated at source, the burning of waste with plastics and other toxic substances becomes a hazardous process. Even during the day time people burn waste in the beaches. The granite quarries made irreversible trenches every where. The stinking garbage in and around of Kovalam causes health as well as aesthetical pollution. Since the composition of waste includes plastics, fumes from waste burning pits poses threat to the health of the people from toxic gases and substances. There is no system to treat the effluent. Some hotels have effluent treatment plants to treat the waste water from their establishment. All the waste water passes through the streamlets and canals to join the sea. There are hotels operating on beachfront that drains out the sewage water right on the beach. This is a common practice during the night. Since garbage is an aesthetic problem people finds it is easy to hide waste from the vicinity of tourists by burying it. The easiest place to do this job is the beach. During night people bury waste on
the beach. During the monsoon when the sea invades land all the waste will come out in its dirtiest form with lot of tiny creatures like bugs and worms. The Action plan also included a periodical cleanup programme – to be organised along with various stake holders and with volunteer help. Over the period of the programme, and till a proper system is in place this cleanup would maintain the cleanliness of the area.

**Implementation of RRF’s:** The Tourism department found that this action plan had a long term perspective and they decided to partly support the projects financially in 2003.

Segregation alone will solve about 70% of the problem of waste by creating opportunities for resource recovery. Kerala Hotel and Restaurant Association of Kovalam agreed to have systems in their firms to do segregation of discards. More over they agreed to contribute for the common facility where these segregated discards will be handled safely. Later this contribution came by way of land and labour. The KHRA also agreed to undertake the transportation of segregated discards to the facilities which are going to be set up in Kovalam.

A model RRF have been set up in Institute for Hotel Management and Catering Technology (IHMCT) campus where a 15 m3 biogas plant was installed to take in 300 kg of food waste generated in the campus daily. This facility was inaugurated in February 2003 and is providing cooking gas for the IHMCT kitchen and manure for the kitchen garden. According to the IHMCT the facility helps them to save Rs. 5000/- worth cooking gas on a monthly basis. In the month of August 2003 a connection of biogas was given to the Campus hostel kitchen also. This will enable the institute to utilize the capacity of the bio gas plant fully. A Resource recovery facility was also attached to the bio gas plant in the month of March 2003. There was an existing garbage transfer room, which was modified and converted to a Discards Transfer and Resource Recovery Room. Here all the non degradable discards which were earlier burnt away were now segregated, cleaned, and stored for sales to recyclers/secondary buyers in Kovalam. Appu, who has a discards business finds this a good source of additional income. More over this facility generated employment for a woman who is a member of Women Self Help Group of Muttackad in Venganoor Grama Panchayath. This facility now attracts people from hotels, Panchayaths and other institutions as a model for handling waste in a sustainable and productive manner. This facility inspired some of the hoteliers of the region like The Hotel Abad Palm Shore and the Hotel Udaya Samudra to set up their own bio gas plants. The ZWK programme has also installed a Biogas plant and proposes to setup a RR facility in the KTDC owned Hotel Samudra.

Three biogas plants of 25m3 capacity each have been proposed for handling the biodegradable discards generated in the hotels and restaurants functioning at Kovalam. For this KHRA donated their land at 2 different locations behind light house beach, where the construction of biogas plants were initiated. It was proposed that the fuel gas generated in the biogas plant can be used to generate electricity using a generator. The construction of one biogas plant (Near Hotel Peacock, Light house beach) has been completed and commissioned. A 2.5 KVA electric generator has been installed and it is to light the lamps on the pathway at Kovalam. The KHRA has started moving the biodegradable discards – about 500-600 kgs/ day from 15 hotels/restaurants in the beach area into the biogas. The rest of the waste is collected for selling later. This plant and the waste collection has given jobs to nearly three people, one of them being a women, who comes to clean up the area, sort the discards and take it for selling. The Biogas plant operator earns Rs. 2500 per month and the waste transfer person is employed by the KHRA. The women is paid Rs. 1000 and she gets about Rs. 600 per month in discards selling. Still, there is some discards which we are not able to handle at present and is being deep buried. This is mainly due to mixing of non-biodegradable in the waste stream and this may be the situation till the systems start working smoothly.

The construction of a second biogas plant, for which land was given near the Vaikol Kulam, a pond used by the community, got stopped due to local people’s protest. The Vizhinjam Grama Panchayath opposed the construction work and stayed the process. Secretary, Department of Local Self Government vacated the stay and issued permission for construction. KHRA approached the Honorable High Court and got an order for the protection of plant and construction. The Member Secretary of Kerala State Pollution Control Board also visited the plant and certified that the plant will not do any harm to the public. Still, the proponents of the programme opine that they do not want to set up any plant with...
public opposition. The search for some other land is already on and the next two plants is expected to come up before the tourist season in 2004.

A resource recovery park where all the non biodegradable discards will be taken to and processed for resource recovery has been proposed. The Venganoor Grama Panchayath agreed to support the activity by identifying land for the process. The Panchayath also ear marked money in the plan fund for the infrastructure building in this place. Kerala Tourism will invest the rest of the money needed for the completion of the park. The land is located near Muttackad that is 1km away from Kovalam junction and is easily accessible by road. This venture would be run directly by the Area Development Society of Muttackad and is expected to provide jobs for atleast 6 people in the long run.

While these are only indicative of the various discards management systems and their employment potential, it also tells that if resource recovery is implemented on the ground, the employment generation potential is real. Even at present with handling about 1.2 Tonnes of biodegradables / day and the non-biodegradable discards in one institution and 15 hotels, direct employment could be given to 5 people, and indirect benefits by way of recovery to many more, which is yet to be assessed.

**Cleanup Programems:** Regular Cleanups of the Beach and the Kovalam area has been organised. In December 2003, Greenpeace and Thanal organised a cleanup and fished out discarded bottles especially from the rocks and dumps and launched the Extended Producer Responsibility campaign. 2000 such plastic water bottles and cola bottles were sent back to Coke and Pepsi and were asked to be responsible for the waste they create. They were asked not to dump their waste on the community even as they make profits from the people. Between January 28th - February 4th and again in March 2004, clean-up programmes were organised by Zero Waste Centre with the support of Kerala Tourism and Kerala Hotel and Restaurant Association. The programme mainly focussed on regular dumps behind Light House beach at Kovalam. Disposable plastics are given prime importance in collection process. Pet bottles of packed drinking water strewn all along the back yards of the beach were collected and packed. 10 people were hired for the clean up. The first task was to clean up the small pond, which was the major dump, situated near Lonely planet restaurant at Light house beach. In all these cleanups hundreds of sacks full of materials were collected. An estimated 75,000 PET bottles belonging to major brands like Aquafina, Kinley, Classic, Bisleri, Golden Valley etc were collected and sent to recyclers. Tourists and local people also appreciated the clean up programme. The programme extended to Samudra Beach and Guest House Beach. These bottles were transported with the support of Indian Coast Guard.

Even as the Cleanups were voluntary work, it did give employment to about 30 people but on a daily wage basis. It generated another 500 man days of work in six months time and is expected to continue to do so for another year and half. While they have been accounted, such work do not actually form part of sustainable zero waste employment generation.

**Model RRF at IHMCT: A Case study:**

“Educate those who lead the rest, and you will eventually educate them all.”.

At any hotel management institute, students are taught how to ‘manage’ a hotel perfectly – from graciousness at the front desk to meticulous housekeeping. But at the Institute of Hotel Management and Catering Technology (also known as the Kovalam catering college), the students are taught that little extra bit – managing the WASTE that a hotel creates. The college has its own dedicated waste management programme, and has already started to reap the financial benefits of managing waste efficiently and ecologically. This is the first model “Towards Zero Waste” Institute. The model plant could be set up only because of the continued support of the then Principal of the IHMCT Mr Mohanty, who personally took care to see the RRF set up and the students trained in using the facility. All issues of resistance from the staff and students to participate by segregating were ironed out by his efforts.
Waste to Wealth Initiatives:

**In the Kitchen and restaurants** – All waste generated in the college is segregated into biodegradable or non-biodegradable. All the food refuse from the kitchens and restaurants goes straight into the biodegradable lot, and is sent directly to the biogas plant.

**Sorting and Segregating** - The non-biodegradable waste is further sorted into paper, metal, plastic, glass, cloth and hazardous substances – such as spent batteries. Generating wealth from waste is something that Chandralekha, a woman from one of the Self Help Groups in the Venganoor Panchayath does every single day at the catering college. She is responsible for managing the waste centre at the college, and spends a lot of time carefully sorting and cleaning out the non-biodegradable waste she receives from the college. She then washes, rinses, dries and collects every single piece of ‘rubbish’, and puts it into specially marked bins. When she’s collected a sufficiently large amount of one kind of refuse – say, paper – she is able to sell it to recyclers. The items sold were measured and the sum the institute receives in exchange was meticulously documented as part of this research. In the one year from June 2003 to June 2004, 5050 kgs of discards were recovered and sold for Rs. 12,754. It is difficult to imagine that this amount of items were burnt away each year for such a long time. This amount added with the profits on the cooking gas makes this a self-sufficient project. The details of the items sold and the amount received is shown below.

<table>
<thead>
<tr>
<th>Items</th>
<th>Weight ( Kg)</th>
<th>Total Value (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibre</td>
<td>128</td>
<td>340</td>
</tr>
<tr>
<td>Glass</td>
<td>415.35</td>
<td>376.85</td>
</tr>
<tr>
<td>Metal</td>
<td>372.55</td>
<td>2820</td>
</tr>
<tr>
<td>Paper</td>
<td>3159.5</td>
<td>7529</td>
</tr>
<tr>
<td>Plastic</td>
<td>865.4</td>
<td>1571</td>
</tr>
<tr>
<td>Miscellaneou s</td>
<td>109.5</td>
<td>117.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5050.3</strong></td>
<td><strong>12754.35</strong></td>
</tr>
</tbody>
</table>

**The Bio Gas Plant** – Chandralekha is also responsible for tending the biogas plant. She turns the biodegradable waste into a slurry that is poured into the biogas plant, from where technology and mother nature take over, releasing enough Biogas in a month to reduce cooking gas usage by four cylinders each week! The biogas is being channelled to the college kitchen, the main building and the boys hostel. This is giving the institution a profit of Rs. 5000 at the same time Chandralekha a job. 16 cylinders of LPG gas – amounting to nearly 220 kgs of cooking gas is saved each month.

**Does a Zero Waste project really work?** An analysis of the IHMCT implementation banished all doubts. The program provides employment for Chandralekha, saves on electricity and at least 16 LPG cylinders each month, and provides an eco-friendly, efficient waste-disposal solution to an institute that literally generates hundreds of kilograms of waste each week and used to burn it earlier. And it is completely self-sufficient by now – apart from the initial investment made by the Tourism Department for setting up the bio-gas plant etc – no funds have been needed to support this initiative. While the institute has succeeded in managing the waste generated, now the move is to go Zero Waste in its true sense – through better resource management and by phasing out the non-recyclable, resource
wasting disposable materials use – such as plastic cups and paper plates etc.

But things are not complete till the problems faced in the implementation are also not documented. Many a time the researchers had to rush to the plant site when shock loading, lack of proper water supply to the plant, poor daily maintenance and continued dumping created a lot of problems in the initial months. While these issues could be solved with the continuous and careful intervention, yet the repeated and it was found that a continuous eye was needed to help run the system smoothly. The ZWK team is now looking seriously at how long it will take to actually run the whole system smoothly without much external intervention. The compost pit, which was dug to handle some of the wet degradable waste and garden waste, became a dumping pit and had to be closed. The ladies hostel complained that they have no way of disposing of cotton waste from sanitary napkins etc. A deeply dug and covered sanitary pit was also dug near the hostel for this purpose. Matters of administering the plant are still a problem and needs to be handed over to the institution management. Inspite of this the RRF is also telling on the students of the institute.

When the students of the college organised the Fandango 2004 – the Fun and Food festival from 16th to 18th January 2004, about 1500 people visited the festival and it was organised as a Zero waste festival. The event management team arranged for discard segregation and transportation to the resource recovery facility. Bins were placed at each stall in the festival ground. Moreover student volunteers were there to pick up the materials thrown out of the bins by the visitors. Stall holders went for non-plastic options like leaf plates, ceramic plates, steel spoons, Aluminium foil packing materials, paper cups, news paper bags etc. The main attraction of these was Pala plate, which is made from Areca palm sheath and are as sturdy as a steel plate and is water proof. It can hold hot or cold food items and is lightweight. After use it can be used as fuel for stoves using fuelwood. The concerted effort of the students at Fandango saved almost 2000 plastic disposable plates and cups from being used and dumped. Due to the shortage of supply of paper cups the students were compelled to use about 100 plastic cups. The students even used paper, cardboard, cloth etc as decoration materials for the stall and prevented plastics, styrofoam etc entering the discard stream. About 500 kg of biodegradable discards were generated in three days time. This was totally recovered through the biogas plant. There was about 70 kg of non-degradable discards of which almost 95% were recyclable. They were taken to the Resource recovery facility for selling them to the scrap dealer. Awards were also given out for the best zero waste stall.

The college has brought future hotel managers face-to-face with a viable, cost-effective waste-to-wealth program, and these youngsters, have accepted it wholeheartedly. When they’re out there in the real world, managing hotels that need to be profit-centres as well as the last word in hospitality, one hopes that they carry with them everything they learnt in their college. Including the fact that a Zero Waste programme, like everything else that is good for the Earth, is good for business too!

5.2 MATERIAL SUBSTITUTION PROGRAMME

One of the objectives in the Zero Waste programme is the implementation of Material Substitution. This is expected to be a major employment generator. The research looks at the training programmes and the production units and the process and analyses them in the context of sustainability. In a responsible community that is committed to sustainable development, materials or resources should be efficiently used. This means that the selection of material should be ethically justified in terms of its impact on the environment and the economy. Secondly, as materials will be subject to change it has to take an ethical, economic and efficient path. This means that the conversion should be rewarding in terms of value addition, local economic benefits and employment generation and should not be a burden on the environment. For instance, most of the manufacturing processes today are automated, polluting, energy and capital intensive and not at all labour intensive. At the same time the manufacturing products from traditional material like coconut tree (wood, coir, shell, fiber, leaves etc) has always been labour intensive and directly beneficial. Thirdly, the material once used will be discarded. The discarding process should also be ethical, economical and efficient. For instance, in the case of the coconut shell, the used coconut shell product can still yield carbon black or be burnt for fuel or can still be used for other coconut shell products. Moreover, the disposal process is non-polluting as these materials are biodegradable and add to the biomass. On the other hand the disposal of a plastic bottle or a tetra-pack packaging is practically
impossible without harming the environment or human health.

It is hence imperative that any Zero Waste programme should look at proper resource use through material substitution. Plastics have been identified as a problem, which needed urgent priority. It was suggested that use of disposable plastic products should be discouraged and should be replaced with sustainable products made up of locally available natural material. Women Self Help Groups showed interest in producing these products since it will eliminate plastics in the environment and will create employment opportunities. Moreover, the advent of this petro-chemical product has changed the way materials are produced and used. Now plastics products have replaced many of the traditional materials in such a way that it has induced loss of livelihoods for many like carpenters, bamboo and reed workers, traditional artisans working on leather, metals, wood, leaves, clay etc. Very little information is available to substantiate this statement but the impact is quite visible in terms of the plastic products now available in the market and the condition of deterioration of the traditional sectors. Above all, it is also understood that the benefits of an expanding plastic market was mostly for the big Petrochemical companies led by the Reliance Industries. The Materials Substitution Programme is described on a chronological order of events that happened, at the same time taking sector by sector that have evolved from the programme.

5.3 WOMEN SELF HELP GROUPS AND THE FIRST LEVEL TRAINING PROGRAMMES

At the Skill Share on ‘Towards Zero Waste Kovalam’ which was held at Kovalam Swagath Holiday Resorts during 20th and 21st of November 2001 the issue of plastic was discussed. The idea of replacing plastic and other non-sustainable products with locally available degradable materials was considered for reducing the plastic waste. Two self groups – one led by Ms. Shobhana and other by Ms Sarala both from Kovalam put forward the suggestion that this project must empower women to gain some real income in a dignified manner from the Tourism in the area. They felt that through training and production of these materials, the scope of them gaining by the tourism market is greater. Paper bags, jute and cloth bags, products from bamboo were some of the options considered. This discussion opened scope for the local employment opportunities for the women. Women Self Help Groups (SHGs) who wanted to take part in the Zero waste Kovalam Programme mentioned about the need for capacity building among Women Self Help group in this regard. Their emerged the idea of Vocational Training programmes on such products for Women Self Help groups working near Kovalam tourist Village. Unfortunately, even though the groups which first propounded the idea attended the first level training, political considerations, influenced by the local Panchayath ward member dissuaded them from benefiting from the programme. As if a paradox, many other groups that came later benefited.

After the skill share, the Women SHGs were contacted to get their opinions and suggestions. A formal meeting of all the SHGs in the region was held at Kovalam S.N.I.P. School on 26th of January 2002. Around 100 women gathered to attend this meeting. Though not directly intended in the project area, the President of Venganoor Panchayath, Mr. Roufus Daniel, Mr. Mohanakumaran Nair, VEO of Venganoor Panchayath also were present in the meeting. In the discussion, women said that they need training for these ten products - bamboo, jute, cloth, mud, coconut shell, soap, note book, products out of plantain fibre, Agarbathi and paper bags. It was at this meeting that the Venganoor Panchayath President called the attention of Thanal to Venganoor which also forms part of the Kovalam area. Infact, he said that the impact of tourism is very much felt in their Panchayath as well and hence should be included in the programmes.

It was decided that training programmes for Paper products, cloth and jute bags and bamboo products would be organised. Centres were identified for training after consulting the women who were present in the meeting. After one week the Self Help Groups were asked to reveal their interest regarding product and place of training to Thanal. About 200 women responded to this call.

First Level Training : The ‘Karm Marg’ from New Delhi and ‘Uravu’ from Wynad agreed to impart training for these women. The date for the programme was fixed as 8th March to 14th March and it was communicated to all the women who showed their interest. Three training centres were in Venganoor
Panchayath -namely Vellar, Thozhichal and Muttackad. In Vizhinjam Panchayath, the office of Akshaya Charitable Trust at Avaduthurai, Kovalam was offered by its trustee Ms Latha Sughathan, ex-member of the Kovalam ward, for the training programme. The trainers arrived with necessary materials, tools and products.

The inauguration of the training programme were held at the respective training centres. The programme at Kovalam beach area was inaugurated by Mr. Sugathan, founder member of Akshaya Charitable Trust and former member to the Vizhinjam Panchayath.

The inauguration of the training programme at Vellar, Muttackad and Thozhichal was done by Mr. Roufus Daniel, President, Venganoor Panchayath. He encouraged the training programme and participants and offered the support of the Panchayath. Mr. Mohanakumaran Nair, Village Extension Officer of Venganoor Panchayath was present at Thozhichal and Vellar and he explained the scope of the training programme. Mr. Binu the member of Venganoor Panchayath who was present in the inauguration ceremony at Vellar also declared his support for this programme. Mrs. Suma P. Raman, Member to the Venganoor Panchayath who were present in the inauguration of training at Muttackad also expressed her support and greetings for the programme. The absence of the Vizhinjam Panchayath members started being realised at this point. The Vizhinjam Panchayath member of Kovalam ward, Mr Sukesan and the President of the Panchayath – Sri Mukkola Prabhakaran were keeping out of the Zero Waste Kovalam programmes.

The members of Thanal team explained the idea of Zero waste Kovalam and the importance of this training programme. The ill effects of plastics were also being discussed and the need for shifting from plastic products to natural products was explained. Awareness material on issues of Plastic was exhibited and newsletters on zero waste and plastic were distributed for the Self Help Groups. They also disseminated the idea and concept behind this training programme to the participants.

Veena and her team from Karm Marg, New Delhi taught people how to make paper carry bags and packaging covers. Karm Marg is an organisation that is involved in rehabilitating street children. They demonstrated the production of bags and curios out of jute and cut cloth waste. They explained the need for the unity among the self help groups in such activities, importance of teaming up, how to market the products, how to keep accounts etc. Participants were very much interested in these training sessions. They were keen to learn and practice the techniques.

Women trainers of Uravu from Wynad showed how to make products out of Bamboo. They explained the features of Bamboo and importance of conserving bamboo. They helped the participants to make some household articles from bamboo. The shortage of raw material compelled the participants to use the stem of coconut leaves too.

As an introductory training programme participants utilized the opportunity to know more about alternative products for plastics. The training programmes closed on 14th March with the announcement to re assemble on April 1st week for exhibition of the products and awarding certificate of participation. They gave their feed back to the organizers on organizing a series of training programme in the future. This training programme was supported by Greenpeace.

An analysis of the training program : The number of participants in the training program was 293. The participants were from the four areas and the average attendance from the seven days of training was only 150.6 (51%). The highest number of participants were at Vellur, where 102 persons participated in the training programme. The least participation occurred at Muttackad where 51 persons participated. The training programme was planned at Muttackad on short period of 2 days, and hence the programme couldn’t be announced to all the Self Help Groups of the region. Table below shows the total participation at each of the centres and the attendance
TABLE 11:

<table>
<thead>
<tr>
<th></th>
<th>Vellar</th>
<th>Thozhichal</th>
<th>Avaduthurai</th>
<th>Muttackad</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number of Participants</strong></td>
<td>102</td>
<td>83</td>
<td>57</td>
<td>51</td>
<td>293</td>
</tr>
<tr>
<td><strong>Average of attendance</strong></td>
<td>54</td>
<td>45.7</td>
<td>27.9</td>
<td>26.8</td>
<td>150.6</td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
<td>52.9%</td>
<td>55%</td>
<td>48.9%</td>
<td>52.5%</td>
<td>51%</td>
</tr>
</tbody>
</table>

It was decided to award certificate of participation for the participants who underwent the training programme. The criteria for awarding the certificate were fixed as above 70% attendance in the programme with the consensus of all the participants. The criteria for Muttackad was 50% attendance considering the special circumstances. 119 persons (41%) were found eligible for Certificate of Participation.

The age group of the participants also revealed interesting information. The eldest of the participant was of 58 years and the youngest was of 11 years. Majority of the participants belonged to the age group of 25-35 (95 persons). The children below 15 years accounted for 17.4% (51 persons).

Inspite of the fact that the panchayath member from Kovalam, Mr Sukesan, was trying his level best to dissuade participants from attending the programme, there was very good participation. The presence of the ex-member of the ward Ms Latha Sugathan helping us in the training programme and herself attended the programme, giving the support that the organisers missed in the ward member. Nevertheless, the organisers kept updating the Vizhinjam Panchayath members and the VEO through letters and invitations to the training programmes and also by direct interactions whenever possible, with the hope that at some point they would be enthused to join the efforts. Sujatha, a teacher from Thozhichal joined Thanal in the ZWK programme as a community organizer.

In April, Thanal conducted a review of the training programmes and also the efforts taken to garner the support of other stakeholders for ZWK. It was felt that more trainings to build capacities in the self-help groups is needed. The intention was to empower the SHGs to take up more productive ventures and produce products that have a market in the tourism sector as well. Thanal also decided that they must help the SHGs to promote these products by providing training and marketing inputs. At this point an advisory committee was mooted. This committee was to look at the programmes and give proper directions to the future work. Thanal proposed that the Panchayath Presidents of Vizhinjam and Venganoor, respective ward members, VEO’s, two women from each training area and two representatives of the Zero Waste Team be formed as the Advisory Committee. It also proposed to hold the meetings regularly in every three months, which will assure that the work is properly reviewed. The women and the members and VEO from Venganoor joined the committee and the first of these advisory body meeting was held at the Venganoor Panchayath Hall. The boycott of the Vizhinjam Panchayath continued to worry the organizers, nevertheless they decided to continue the work with the support of the Venganoor Panchayath.

Though no enterprise grew out of this effort in the first instance, these training programmes formed the foundation of the ZWK materials substitution and employment generation programmes. Exhibitions conducted by the Panchayaths as part of the Kudumbasree programs started being filled up with paper, cloth and bamboo products made by these women. Many children also took to making them in their leisure. The real effects of these training programmes were only felt later and its full effects is yet be to be assessed.
5.5 THE COCONUT SHELL – A UTILITY MATERIAL AND SOURCE OF EMPLOYMENT

In Kovalam, natural, locally available and environmentally suitable materials were identified to substitute many of the synthetic products and generate local employment. The coconut shell was identified as one such wonder material that should invariably find its place in all the homes, hotels and institutions as an item that people will use as a common utility in the form of cutlery, crockery or stationary. It has a natural hardy shell, which yields to the craftsperson’s vision and skill. Craftsmen in Kerala and many other parts of the world like Philippines have created art and craft from the coconut shell and these adorn the showcase of homes across the world, as a collector’s item, a composition of skill, craft and utility. But this programme sees in the Coconut Shell a larger potential and diverse opportunity as a utility product. This demands a lot of research, design and product development to be done. Research into quality enhancement, maintaining its eco-friendly nature and improving its shelf life and storage potential, for liquids and solids also needed to be experimented with.

Kalpakam Murali, who has been in the field of coconut shell product design and crafting for nearly two decades and has been working closely with the Coconut Development Board was the main trainer and he continues to help the programme in developing the coconut shell craft in Kovalam.

This process also started in November 2001 with the skill share at Kovalam. Mr. Murali displayed his products and presented his vision and craft. Along with the first level training programme for paper bags, cloth and jute products, Coconut Shell training was also planned. Due to various reasons, including finding the financial support for organising such a programme, the Coconut shell training was delayed till June 2002. But by this time, the Venganoor Panchayath, especially its President Sri. Rufos Daniel, its Village Extension Officer, Sri Mohanan Nair and the Thozhichal Ward Member Sri. Ramachandrakumar showed a great amount of interest and extended patronage for the training and also for developing a proposal for setting up a production centre.

The first level training programme on coconut shell products started on 1st July 2002 at the Akshaya Charitable Trust (ACT), Avaduthura, Kovalam. 20 women selected from thirteen Women Self Help Groups of Vizhinjam and Venganoor Panchayaths and one representative from SISP participated in the 14 day training programme. It was conducted in two shifts of 10 trainees each. Sri. Kalpakam Murali and Sri. K.S. Anil, his nephew led the training programme. From Thanal, Raju, Rajasree, Sujatha and Kala Devi facilitated the training programme. The first part of the training was introduction to the basics of coconut shell handling, polishing, cutting and using grinding machine. The women could make ice cream bowls on the first day itself. The second day started with cutting coconut shells to make oval shaped bowls and other types of bowls. The rest of the days followed were for making different types of flower vases. Making flower vase and cups attached with handles made of coconut shell were taught in the first week. Training on preparation of gum and applying gum on coconut shell products were taught in the last week of the training. Women were given training according to their talents and tastes so each were working on different designs and products. The idea of ornaments from coconut shells was introduced and pendants, bangles etc were made.

After the 1st week of training, the women could overcome the difficulties while working with unfamiliar tools and stress they felt in the initial phase of the training and became more enthused and showed interest in making products out of shells. The training helped them to find out their own skills within. The people with out any exposure earlier could create very good craft from raw coconut shells and it made the women happier and proud. A minimum of nine designs was taught to each in the 14 day training programme. To inculcate the spirit of teamwork and to build confidence in women to work as a group, they were asked to form groups in the second week of the training to make ice cream cups and bowl sets. The objective was to bring in the skills of women into a product and to teach them the beauty of teamwork.

Closing days of training were for teaching the finishing touches like polishing with oil and charcoal mix, applying gum etc. On the 14th day of training the participants were asked to exhibit their products and to share their experience. An exhibition of all the products made by the participants during the training programme was organized at Hotel Best Western Swagath Holiday Resorts, Kovalam on 15th of July. People from all walks of life came to visit the exhibition and were amused and interested at the
The training enabled the participants to make products of their own. They felt this as an opportunity to earn a living. Some women did not share the same confidence and demanded more support in terms of training and directions. The 15-day long programme saw the spirit and initiatives of the women to learn.

This training programme was a turning point in the ZWK programme as much interest was evinced, especially regarding the potential of material substitution as a means of local economic development and employment generation.

**Coconut Shell Production Centre at Thozhichal, Venganoor Panchayath:** Soon after this, discussions started at various levels to lead this training programme into a production centre for coconut benefiting the women by way of employment and livelihood. The Venganoor Panchayath decided on principle to support the production centre through the Kudumbasree Programme. At the Kudumbasree Project finalization meeting of the 5 wards of the Venganoor Panchayath organized at Apsara Theatre Hall on July 27th 2002, the Venganoor Panchayath included the coconut shell products production centre as one of the enterprises. On August 5th, a feedback meeting on the 15 day Coconut shell products training programme was held. The women trainees from Venganoor decided to start a centre for coconut shell production at Venganoor. Two SHG’s showed interest in starting centres in Vizhinjam. But participants from the Vizhinjam Panchayath generally felt that their panchayath was not supporting them nor encouraging them. This meeting was also held at ACT Hall, Avaduthura.

On the same day, a very detailed discussion was held with the Venganoor Panchayath about starting the coconut shell production centre. This meeting was attended by Sri. Rufus Daniel (President Venganoor Grama Panchayath), Sri. Ramachandrakumar (Member Thozhichal Ward), Sri. Mohanan Nair, VEO, Mr. Murali (master craftsman and trainer) and members of Thanal. The Panchayath decided to set up a training centre at Thozhichal with the support of Kudumbasree project. The materialisation of the centre took another two months during which many rounds of discussions and interactions happened. The initial cost of starting such a centre was the main obstacle. Sri. Ramachandrakumar, Thozhichal ward member offered to give his land for setting up the centre. 11 women from various SHG’s and wards joined together to form a unit and each member decided to invest Rs. 1000 towards tools and other infrastructure to set up the centre. The Thozhichal Area Development Society (ADS) loaned the money necessary for building the shed for the centre. Thanal decided to coordinate the activities of the centre, until such time when the centre would be able to run by itself in a sustainable manner. Thanal would support the women in market promotion and outsourcing the products, but made it clear that it does not wish to be a marketing agency for the same. The women would approach the Kudumbasree to support the venture as well as the training fees. The training fees for K B Murali was fixed as Rs. 20,000 for the first month of intensive training and Rs. 2000/month for the next 10 months, where he would be available for two days every week. It was also decided that in a years time he would teach 40 products.

Thanal participated in exhibitions where the coconut shell products from the training were showcased. One was organized by Kerafed to commemorate International Coconut Day on September 2nd 2002. The other exhibition was the one organised by World Wildlife Fund-India at Jawahar Balabhavan, Kanakakunnu.

On October 15th the Coconut Shell Production Centre (CSPC) was formally inaugurated at Thozhichal in Venganoor Grama Panchayath. The one-month long intensive training programme began. While the initial membership to the Centre was restricted to 11, another 5 more members from the Thozhichal Ward were allowed to join as new trainees as per the request of Sri Ramachandrakumar. Thus with 16 members on board the intensive training period had to be extended to another 15 days. This was the first of the issues that started at the Centre, because Thanal had to support the additional days of training as well as the stipend for the additional people with their own funds. The women had no other funds for training except what was coming out of selling the products. By November end, the trainees had got enough exposure and hands on practice and were growing into good craftswomen. During the training period Thanal supported them with a monthly stipend of Rs. 500, which the Centre was supposed to reimburse from their sales as and when it happens. The products that they had made during their training period were of commercially sellable quality and could be used to support them during the
coming months. Thanal also advanced the wages for the month and a half starting mid November to end of December.

By November, it slowly dawned that Kudumbasree may not be able to support the Coconut Shell Production Centre because it comprised of women from both Above Poverty Line (APL) and Below Poverty Line (BPL) families. The interesting matter was that the members of the BPL included the wife of the Panchayath member, whose actual assets clearly showed that his family should be in the APL. But many of the members of the unit who were graded as BPL were extremely poor. These problems remaining, the Kudumbasree Mission being a Poverty Alleviation Programme run by the Kerala State Government, could not by rule support the Centre. At this moment, the Thozhichal ward member mooted the idea that the Kudumbasree would support if the Centre is registered as a BPL unit with the APL graded women joining as workers under them. This was suggested as an arrangement to get over the crisis. But Thanal left the decision to the women in the centre and following discussions with the President, VEO and the Member of the Thozhichal Ward and with the committee members of the Centre, it was decided that the Centre would run independently. It was also decided that the unit can be registered as an SSI and Thanal should continue to coordinate the running of the centre. While Thanal did not have problems taking up the additional responsibility, the financial implications were something that the Panchayath through the Kudumbasree or some other agency should have supported. Nevertheless it conceded to the demands of the members of the Coconut Shell Production Centre that they wanted the support for some more time.

In November two more exhibitions were done, one at a Residential Colony in Trivandrum, which evoked a good response. The other was organised by Kerafed at Neyyatinkara, which did not yield much financially. During December and January 2003, Thanal participated in four more exhibitions as part of promoting the Coconut Shell Products. The exhibition at the Kerala Sanghamom held between 26th and 29th of December at the Cotton Hill School Grounds was a grand success and there were a number of people from all over the State who showed keen interest in the coconut shell craft. Another exhibition, which Thanal participated with the coconut shell products, was at Fandango, the Food and Fun Festival at IHMCT between 17th and 19th January 2003. The exhibition at Kannur Flower Show for seven days from 27th January 2003 also helped spread the message across the State, apart from the sales income received. The cost that was incurred for the sales promotion during these exhibitions were drawn from the account of the Zero Waste funds for market promotion and support as it was felt that the Centre needed such support in its initial phase.

During the three and half months of the working of the Centre, the women were not only involved in producing good craft but were also becoming adept in handling situations that arise during team work. They were having regular weekly meetings where every decision taken over the week, and their work was discussed. During these meetings they kept even the coordinating agency out and displayed their urge to work in autonomy. The decisions they took were then shared with the Panchayath member and Thanal. The women were also keeping their records like stock, minutes of the meetings, accounts etc. They had learnt 15 designs in these three months and could produce them in large scale if needed. More than 80% of the stock they had produced till February 7th were sold in the exhibitions, which showed the market potential of this product. The only lacunae here was that the production rate was not substantial enough to sustain the unit.

The Centre (CSPC) was also getting a lot of direct enquiries and there were plans to explore other markets directly by the members of the centre. At this time, some of the enquiries came through some enterprises, who said that they will market all their products and supply them coconut shells. Though, Thanal warned the women against such offers, there was doubt in many women. Moreover, the Centre had decided to explore the possibility of registering itself as an SSI and also moving independently, or so the members of Thanal thought. But later, it was revealed that all these were part of the Thozhichal ward members attempt to keep the women under his political and administrative control. The VEO of the Panchayath was also freely using the Centre to bring foreigners and showcase the products, even without asking permission from either the trainer or the women. All these gradually led to issues and some of the women felt that their association with both Thanal and the Panchayath was not any more productive. The women then met and decided that the Coconut Shell Production Centre needs to work independently in terms of administration, financial management and also marketing. In February 2003,
Thanal sat on a review of the centre and found that it was impossible to run the centre whether it be by Thanal or the women and that very soon the intervention of the member and his vested interests would ultimately destroy the centre. Some of the women had already left the centre unable to accept the way things were going. Thanal decided to disassociate from the centre and wrote off the financial loss it had incurred in the process. What remained was very significant learnings that guided Thanal to build the rest of the training and employment generation program. But nevertheless, Thanal advised many of the women in the unit to continue their work. It also advised women as to what all needs to be done to continue running the unit. Some of them are

- The Coconut Shell Production Centre is yet to have a proper name by which its products can be marketed. (Later they called it PalmCraft)

- The Centre needs a latrine and a good locker and storage facility for the products and tools.

- The Centre should have a well-researched marketing strategy. The cost of selling these products must be kept as low as possible.

- The Centre must be equipped with a very rigorous process of quality control, which is highly imperative for the market demand to sustain. (This was literally impossible for them, as training for these was still pending and the women did not realise the importance for this)

- The production rate needs to be increased gradually over the next few months, till it stabilises to sustainable levels. (This they could never achieve)

- The Centre must diversify its products and go for newer designs of the products that are being produced as well as be trained in newer products, which have market demand. (A new committee formed under the indirect control of the ward member tried to get some other trainer but could not succeed.)

- The Unique Selling Point (USP) of the Centre’s Products is that they are natural and eco-friendly and of food grade quality, which means they stand apart from all other coconut shell products presently produced by various agencies in the State. This was achieved because the products have a natural polish, without the use of any toxic paints or varnishes. This USP must be maintained.

- A Committee which includes the President, Member and VEO of the Panchayath, the members of the ADS and others whom the members of the Centre decide upon should be constituted to act as an advisory board to the Centre.

It is hoped that the women members of the CSPC and the Advisory Board would take care to carry the message of the Centre and its goals forward. But as fate would have it, slowly the women left the centre and today, the centre’s shed stands in a dilapidated condition, all the equipments taken away and the Centre is literally closed. Though late, we also learnt that the ward member had in his time started many other units under the SHG scheme and all of them were closed – the equipments (tailoring machines etc) still remaining as asset in his house.

It was after this failed exercise that Thanal decided to setup the Zero Waste Centre in Kovalam, which would be the hub of training and resource use education. Thanal also found that a production unit based approach, especially one that is not organically built up with a feeling of togetherness and common objectives for all, has inherent problems. It also learnt that while the political support is needed for any group or production unit to function, yet the control and decision-making must remain with the women.

The market potential of coconut shell products as a craft piece is well recognized, but while craft pieces target the high-income sector it does not have a very high volume market. Zero Waste emphasizes that coconut shell products substitute the toxic plastic materials in various uses and also be an alternative
to other metal utensils as well. Traditionally, the coconut shell utensil market has mostly been restricted
to spoons, thavas, bowls, ice cream cups etc. But constant innovation from a few craftspersons, like
Kalpakam Murali have produced about 50 different utility items in various designs. For these design
innovation to improve and for training, follow up and enterprise building, the Zero Waste Centre (ZWC)
was setup. A fully equiped coconut shell training unit was set up at the Centre. One of the women from
the coconut shell group, Sheela joined the ZWC as an assistant trainer to help Kalpakam Murali in hisd
training and also to develop the coconut training unit and be in-charge of it. This unit could later train
many women and youth.

Zero Waste Centre has already participated in many exhibitions organized by the Coconut
Development Board including the AAHAR 2003. It also participated in many exhibitions organized by
the Tourism Department, KeraFed etc. Coconut products developed at the Zero Waste Centre have also
created a lot of responses from the business sector. A number of exporters and hotels groups regularly
order these products. Some of them have demanded high volume of these products, which cannot be
created in a short time by a handful of trained craft persons. This provides an opportunity for more
people to take up coconut shell products manufacture as a self-employment. This would create a larger
source of coconut shell products and better supply to the demand in the market. The Coconut
Development Board, Kochi has been supporting the Zero Waste Centre for a number of exhibitions.

About 10 women and 4 young men of the locality has been trained in coconut shell craft, apart from
the earlier training. The trainees from the Sebastian Institute for Social Projects (SISP) have started
commercial production of shell products. Two women have joined the unit started by Nikitha of Keerthi
SHG. Totally 28 people including four boys were trained in Coconut shell products of which 14 people
(10 women and 4 boys) are engaged in coconut shell production though on a small scale. Five of them
are starting a new unit with an additional five women to support their work.

Many housewives are earning an additional income by supplying coconut shell in a required fashion
to those people who are working in the field. The tourism industry, especially hotels and restaurants in
Kovalam and around are now attracted by these coconut shell products. As a part of zero waste initiative
they are being encouraged to replace plastics and other synthetic materials with coconut shell products
and the like. Promotion of coconut shell products also stimulated revival of traditional cooking styles
using coconut shell as steaming vessels which is very efficient and easy to use.

During the course of two years of work together with craftspeople, market experts, artists and design
experts and with the continues discussion with experts in the coconut sector, especially in the Coconut
Development Board, it has been realized that

1. The eco-friendly, non-toxic finished, utility products have a universal appeal in the global,
national and regional market, which is increasingly gaining consciousness about the benefits
of organic lifestyles.

2. The current production capabilities for these products is not enough to cater to the demand.

3. That International-level exploration and networking supported with continuous Research
and Development need to be done to better the product, design and value.

4. That an aggressive market promotion needs to be done, with the foundation being eco-
friendliness, fair pricing and local employment support.

5. That in the process the products cost, especially of the utility products must be optimised to
cater to all sections of people.

6. That women can easily take to this craft as a vocation, as the work involved is not very
tedious.

7. That coconut shell products provide an opportunity for local level employment and
economic development, especially in the Below Poverty Level (BPL) Sector, as the
investment needed for starting a unit would not be very high.

8. That the focus of development of this craft and utility product must be on home/cottage based units and the target must be to develop an area as a cluster for these products.

With these needs and understanding, the Zero Waste Centre has now set up a full fledged, permanent training facility at the Centre. This Facility has all the required equipments and infrastructure to undertake training in coconut shell products. The facility can train five persons at a time and provide internship for two. This facility can be used as a nodal centre for training for Panchayaths, Kudumbasree, Women based cottage industries, entrepreneurs, voluntary organizations, etc. It is envisaged that clusters of coconut shell craft manufacturing homes/families be developed and integrated. There have already been enquiries for training from other States as well. A group from Orissa and Dahanu has already asked for training. Training is being planned for groups from Andhra Pradesh as well as toxic-industries impacted communities in Bhopal and Tamilnadu. A group from Malaysia has also enquired about the training in Coconut Shell. A lot of interest has been generated at the National and International level, especially after the Centres display of products at the World Social Forum gathering at Mumbai in January 2004, and its exhibitions at the Grass Roots Recycling Network at Berckley, US.

Towards imparting training for women in coconut shell craft and utility products, three levels of training is being done. Tools for coconut shell work are diverse and they have not been optimised. It is also proposed to study by use and testing the tools that are presently being used by various craftspersons in the field. After this an optimization will be done after a wide level of discussions and testing and a complete and affordable tool kit with users manual developed. This will then be tested and optimised for use by the master craftsperson associated with the ZWC. This kit and manual would then be ready for supply to the trained craftspersons.

5.6 POISON-FREE FARMING

The main objective of the programme was to move the community to sustainable and toxic free environment. Chemical Pesticides and Fertilizers are materials used in farms and today the effect of this in agriculture is slowly taking its toll on the health and environment of the farming community. In countries all over the world and especially so in India, extensive pesticide use have been directly blamed for the increasing production cost of the farm products, putting the farmer into debt and leading to suicides. The face of the hapless victims of the tragedy in Kasaragod due to endosulfan spraying is still too fresh and disturbing. Usha, who is leading campaign on sustaining farming and campaigning towards a poison free farming started working among women SHG’s most of whom were already interacting with the ZWK team. One SHG – Shreesakthi in Muttackad of Venganoor Panchayath and its president – Esther decided to shift her farming and her group to producing poison free vegetables and banana. This programme thus started in April 2002, which was very soon followed by other groups in Muttakkad, Azhakulam and now there are many groups involved in poison-free farming. Most of the women who adopted this did not even have their own land, but took land on lease to start their farming. Many women could manage to do even small farming in their own backyard. But the immediate and most promising response was from the Venganoor Panchayath President and members. They wholeheartedly endorsed this initiative and declared that they would shift Venganoor Panchayath into chemical free agriculture in five years time. The necessary schemes were introduced in the 10th five year plan document.

This programme is so important for a Zero Waste Kovalam, because of the importance of the only fresh water lake Vellayani Kayal and the various ponds in the area where the water from the fields flow out into. The Vellayani lake, which comes in the Venganoor Panchayath and borders two other panchayaths is the drain of all the rain and outflowing water from the surrounding panchayaths. This lake is also the future source of water for the tourist village and a water supply scheme is based on this lake. It is thus important that the lake be made pollutant free, especially since the only source of chemical pollution in that area is from agriculture run offs. This initiative hence offers an additional benefit of making the environment – land and water and the food of the local community free from pesticides and chemical fertilizers. Shifting to organic farming also needs a lot of organic fertilisers, which can be supplied from the biogas plants and also from local composting of the waste, including hotel waste.
The programme aims at a “Land and Food without Poisons” and is guided by the principles of sustainable farming and to bring back the control of women over farming.

Composting of urban waste is an essential process to ensure the “closing of the organic loop”\(^{25}\). During crop production, nutrient and organic matter is lost from the agricultural farms and soil, which in turn increases the use of chemical fertilizers. Manufacturing fertilizers is a highly polluting, resource and capital-intensive process. On the other side, food crops are consumed in raw and processed forms and ends up as excreta and garbage, the disposal of which becomes difficult in places where it is consumed. This results in costly and polluting disposal technologies at this end, leading to socio-economic and environmental problems. Returning the nutrients in the organic matter of urban waste back to the farm soils would stop resource wastage on this linear flow line and “close the organic loop”. This would also alleviate much of the problems that arise at both ends of the linear system, eventually reflecting as economic benefits. Moreover, the quality of the compost is itself quite sufficient for replenishing the soil naturally. On the contrary, application of chemical fertilizers, while yielding good crops in short times has actually wiped out earth worm colonies, killed the natural life of the soil and rendered it saline and lifeless.

When avoiding chemical pesticides it is important that the women be taught simple techniques and tips to improve crop productivity, enhance growth, pests and diseases control by using biological and other non-toxic methods, along with the fundamental philosophy of organic farming. Institute for Cultural Research and Action (ICRA) a voluntary group in Bangalore have documented and applied a number of the techniques of Integrated Pest management and Organic farming. Two experts Dr. Ravi and Mr Sreenivas were invited to share their skills among the farmers, especially banana farmers. This skills share was organized on November 17th 2002 at Muttakkad. 31 women belonging to 8 SHGs participated actively in the class and discussions which was organized on the open ground near the organic farm yard run by Keerthi SHG, one of the active SHGs of Venganoor panchayat. 2 men who are the members of a SHG too participated in the class. The Panchayath President, Panchayat members Suraja Sudarsanan, Leela Babu, K J Surendranath and other persons interested in agriculture also participated actively in the class. The focus of the class was to learn how one can do chemical free agriculture-organic farming, how one can bring back the nutrients and minerals which are very essential for a plants growth, how one can save the crops from the pests and disease without killing the many farmer friendly microorganisms, insects and birds and how one can we make our agricultural production cheaper and make farming profitable.

The Panchayath through their schemes announced subsidies for the banana farmers attempting organic methods. Even though there was a limitation that these farmers must put up atleast 2500 banana plants. There was discussion of how such restrictions imposed by the centralised schemes of the Agricultural Department was actually not helping the ordinary women farmers who were shifting to farming as a livelihood in a serious way. Such policy questions need to be addressed. Nevertheless, the enterprising women SHGs took land on lease and planted the banana and many of them got these subsidies as well, some by simple manipulation of the numbers shown.

Now Thanal and the Keerthi SHG group led by its very enterprising leader Nikitha have joined the Organic Farmers Association of India (OFAI) movement.

By the middle of the year 2003, many women farmers were producing their own small quantities of poison-free vegetables and also were starting to harvest their banana. Thanal was exploring ways of helping the women market these organic produce. These produce were being sold along with the conventional pesticide sprayed farming produce and were not being considered for their extra efforts nor the quality. In August 2003, the Institute for Integrated Rural Development (IIRD) Aurangabad wanted to expand their Organic Bazaar programme in other cities in India, and they were looking for partners to start regional experiments on local alternative marketing of organic produce of the small and marginal farmers. Thanal took up this initiative and with the support of the farmers and consumers in Thiruvananthapuram started the Organic Bazaar, a monthly bazaar which served as a platform for the

producers to bring their products and the consumers to come and know them and buy their products. The Organic Bazaar is an innovation in alternative local marketing of organic produce. Now the Organic Bazaar is nearing its one year and is being reviewed. This initiative is now run by a Local Organising Committee, consisting of farmers and consumers and representatives of Thanal. Local standards to maintain the Organic integrity of the products has been developed participatively. This market now has about 28 producers and more than 200 registered consumers. About 100 of them regularly visit the Bazaar, which is organised on every second Saturday at the Jawahar nagar UP School, near a prominent residential area.

The Poison-Free farming process and the alternative marketing experience has provided another big opportunity for the women, who take part with much enthusiasm. About 28 women are involved in small but significant farming activity and they bring their produce to the Bazaar. This provides a small income but a lot of happiness.

The Zero Waste Centre also acts as one of the organisers of the Organic Bazaar and the centre has developed a small model farm in its own premises. The Centre also has a small outlet for the produce of these groups. They keep their products here either for sale or display and are paid the sales amount as and when it is sold.

5.7 ZERO WASTE CENTRE

The first two years of work with the women groups in Kovalam made us realise that there is no training that is accessible to the women or youth and children to earn by part time work or getting ready for a full time self employment. Most of the issues which were seen in the SHG training programmes organized by the panchayath either by NGO’s or by the Kudumbasree Mission was that

♦ Women are brought together as a SHG, and they come together to deposit thrift and take loans but when it comes to enterprises, these groups turn out to be mostly diverse and conflicting in their interests and sometimes of differing socio-economic-political classes. Thus the training provided simply goes waste.

♦ Many a time, we found women trained in a number of vocations for example : in Book binding, paper bag making, tailoring, soap making, candle making and even organic farming using Kudumbasree funds but these women approached us asking "Give us more training for something!! Most of the training is not intensive and really skill imparting and with this training the women enterprises are not able to set up their own units and run them successfully.

♦ Sometimes the training is so superficial that most of the claims, as we found in many of the Kudumbasree Units, was not found on the ground. There was no follow up in terms of advanced training, product diversification, quality control etc

♦ The training programmes mostly organised during the office hours was not of use to the interest groups. The training often stopped at training and there was no support or inputs once they start a unit or take up a work. There was no training for enterprise building or management training.

♦ Often the conflict resolution failures in the groups resulted in break up of the groups and the activity was then cited as failure.

Even though Thanal wanted to set up a centre as early as mid-2002, the Centre started being actually setup in February 2003. The learning from the ground, namely the success of the first level training and the set back that the team had from the Coconut shell production unit was the immediate cause for speeding up the establishment of the Centre. The ZWK team realised that such a centre was needed for
the community to engage with the Zero Waste ideas in the community and also to dialogue with the political and administrative systems in the area.

The Zero Waste Centre, is a part of the Zero Waste Kovalam project and is created as a Resource Education Centre with the objective of imparting Training, Product Design and Development and Awareness about Resource Use. The programme demands ideas, products and designs that are diverse and ecologically based. The Centre evolved from the need to compliment the effort of the Zero Waste Kovalam programme. The Centre started functioning from Azhakulam, Kovalam from April 1st 2003. The Zero Waste Centre is intended to

♦ Be the Hub of innovations in materials substitution.

♦ Create Environmental Awareness among the Community, Students, Policy makers etc

♦ Build Capacity in production of sustainable products

♦ Provide a marketing space for sustainable products

♦ Develop a theme based-museum of sustainable products and craftwork. Presently the themes are Coconut shell, Jute, Cotton and other natural fibers and Paper.

♦ Generate surplus from sale proceeds to help more such ventures and be a non-profit Centre owned by the community.

♦ Provide a networking platform for artists, crafts persons, innovators, scientists, administrators, businesses and environmental activists to revisit the material use and policy and to move towards natural and sustainable material use.

♦ Be a Research Centre for Materials Management and Resource Use Studies and Education focusing on human and environmental health.

The attempt of the Zerowaste Centre is to provide both training and capacity building and a facility for continuous upgradation of skills in product and design development. The Centre is intended to help the panchayaths in Kerala who want to link up with the “Waste to Wealth” programme as part of the waste management. The programme is already supported by the Kerala Tourism Department and has the support of the Hotel and Restaurant Industry in Kovalam. The Kudumbasree mission has already supported one SHG in Paper product manufacture and the Panchayath Plan fund has supported ten SHGs in Organic farming. There has been some individual supporters and there has been financial support from the Association for India Development (AID) and the New World Foundation.

The Zero Waste Centre works on a non-commercial basis. One major objective in the long term is to have a cluster of micro-scale production units working from a family or neighborhood groups or Self-Help Groups. The Centre would provide the facility for training, and regular refreshing with internships. The Trainees would also be imparted with capacity building exercises on Office Management, Accounting, Market Promotion and Leadership.

During the last one year the centre initiated activities which brought the community, local self government, hoteliers and business people together to work towards creating a zero waste society. This could bring in new employment opportunities to the local people especially women. The centre supported one group of women each to start a paper products unit and a coconut shell products unit. These two support around 18 women directly and many more indirectly. Now more women are coming forward to get trained on paper and coconut shells and materials like banana fibre, handloom cloth and jute all of which can replace plastics from packaging and other daily uses successfully. The local community is slowly getting the idea that if they are ready to forgo the unsustainable materials use like plastics they will be socially and economically benefited. The basic premise on which the Zero waste centre works is building relationships. There are 14 employees at the Centre as of now, most of them from Kovalam
Zero Waste Centre also has become a catalyst in many things during the last one year of its existence, especially in guiding the farmers towards poison free farming. Now ten groups of women and many individual farmers are in a process of transition from chemically intensive farming to biodiversity based ecological farming. The centre also helps in developing a market for them through building relationships with the consumers in the Organic Bazaar programme.

At present the ZWC has associated with it Nikitha's Keerthi SHG (4 women), Pioneer Paper Bag Unit (12 women), the production unit at SISP (15, including 4 men), the coconut shell unit to be run by Ms Omana and her group (10 women - yet to start), An applique work and tailoring unit (6 women), and 28 women from the organic farming. They use the Centre's space and facilities and also come together and help in organising common functions and events such as the Organic Bazaar. The Centre also helps one handloom group led by Ms. Manjilas from Perringamala.

Another major activity which the centre undertakes is a monthly programme for children called ‘Children and Toxic free toys’. In this children are taught to make toys with the natural materials and they are also oriented towards nature through classes, poems, films, natural history studies etc. Around 70 children from 16 schools regularly attend this monthly programme.

Zero waste Centre works on the principles of zero waste – ethics, efficiency and economics – trying to develop a society where local community and environment are benefited by adopting the zero waste principles. A lot of visitors - students, farmers, panchayath members, officials, tourists etc. come regularly to the centre to see the programmes and to understand the idea of ZERO WASTE.

Presently the Zerowaste Centre has devised training facilities for Paper bags and many other Paper based products, Cloth and Jute bags, and Applique work from discarded tailoring cloth. Three levels of coconut shell training is also conducted. In all these training programmes, the Centre looks at a long term personal interaction with the trainees and their families so that they understand and imbibe the need for zero waste. This is the basis on which they produce and market their products, because products need a careful marketing strategy, and in the Zero waste produces need campaign that speaks of ecological sustainability and local economic development. The Centre maintains a longer association with the trainees aimed

- On Personal relations to build a strong and sustainable community.
- To create platform for understanding our environment and health.
- Technical assistance to develop new designs.
- Technical assistance to set up production units.
- Technical assistance in marketing.
- Invitation to participate in design workshops, seminars, exhibitions and other programmes.
- To provide a sales/display/promotional window at Zero waste Centre for the products of various production units.

Presently the ZWC is located in the ground floor of R B Towers (cellar floor) at Azhakulam in Kovalam on the way to Vizhinjam. The Centre has an advisory board, which have both Indian and international experts to guide the work of the Centre and take it forward. A committee has been set up in the Centre, consisting of all the people working there as well as associated with it which will guide the running of the Centre.
The Centre follows transparent decision-making and works on democratic principles. It also makes sure that the equitable sharing of resources, individual responsibility and need based activities will be the values that will guide it forward. The overall programmes is based on the Zerowaste principles and ethics and values will be the overdriving aspects of work. The Centre itself attempts to be a Zerowaste establishment.

The following training programmes were organised during the year from April 1st 2003 to March 31st 2004

- Paper Bag making – Used newspapers / Recycled paper/ Virgin paper
- Cloth/Jute/Tailoring Waste Bag making
- Coconut Shell Products Crafting
- Screen printing and dying (this was later not continued primarily because this is only an additional skill needed and moreover the materials used are extremely toxic chemicals)
- Composting, vermi-composting
- Poison-Free farming practices

Leadership training programmes also forms an important part of the Centre’s activity as it is seen that many of the efforts of small groups of women do not sustain as they lack in many capacities that is needed in changing global circumstances and local challenges. These training will include management, communication, and accounting skills as well as other skills needed to take innovative initiatives forward.

5.8 PAPER AS AN OPTION AND THE PIONEER PAPER BAG UNIT

By the end of 2002, a group of women, from Vellar most of them who had undergone the first level training came together and decided to start a paper bag making unit. 13 women from various Kudumbasree SHG units came together. They called themselves the Pioneer Paper Bag Unit and in January 2003 established their small shed and started functioning. The success of this unit is a lesson that needs to be documented and analysed.

Initially when the women wanted to start the unit and approached the Venganoor Panchayath with a proposal, it was not seriously considered by some of the panchayath staff. Since this was a Zero waste initiative, the member of the Thozhichal ward as well as the VEO even tried to dissuade the women by creating unnecessary hurdles. But their ward member Sri Binu and the Panchayath President Mr Roufus Daniel gave all their support and motivated them to start the unit. The 13 women invested Rs. 1000 each and this money was used to construct a small thatched shed. Many people in their families and locality helped them build the shed and the women themselves put in their labour. This reduced the cost of construction of the shed. All the members of the unit were from families below the poverty line (BPL) and where entitled to apply for the Kudumbasree support for the project. They also registered themselves as a charitable society under the Societies Act. The Centre was inaugurated at the shed on 13th January 2003 by the Panchayath president. On 12th March, 2003 the Kudumbasree officials and the Central Bank officials graded the unit as per the rural development project. They came first among the units graded in the panchayath with 160 out of 170 points excelling in record keeping, project proposal etc. The women then submitted a project proposal for the grant of Rs. 30000 from Kudumbasree. This was held up by the panchayath officials for unknown reasons. The women reported that one of the officials had even asked for Rs. 1500 to write a good proposal for them. At this time Thanal intervened and helped them develop a better and more realistic proposal for Rs. 2 lakhs as they would
need some machinery, and a running expense for the initial months as well and they could get a subsidy of Rs. 1 lakh from the Kudumbasree. The Central bank also guaranteed them Rs. 1 lakh loan if the Kudumbasree could subsidies for Rs. 1 lakh. This was sanctioned. Inspite of this the group continued to face trouble from the Panchayath officials and when Kudumbasree Director came to know of this, he directly gave the cheque to the Unit president. This was an unprecedented action which was criticised by the Thozhichal ward member and the VEO. But their own ward member had given the nod for this action and staunchly supported the women. Though not true, Thanal was also blamed for using its influence to get this done. Thanal then conducted a series of training for the women to horn their skills and also to improve the quality of the paper bags. Raju S and Rajasree VV were the main trainers.

Managing the Unit: The women in the Unit elected Ms Seena, one of their youngest members as the Secretary and Ms Ramani, their oldest member as the President. They still continue to be so. The group holds meetings every week and discusses the business of the preceding week and other matters concerning the staff members. Each member of the group is entrusted with specific tasks for the smooth functioning of the Unit. Each day the work start at 9:30 am and ends at 4:30 pm. Sometimes night shifts are also needed to complete orders. There were challenging times because the Unit had to work against time to deliver orders and also manage family problems of the members. But pleasantly many of the men folk came to understand and support the women in their endeavour. The members also made it a point to attend the meetings of Thanal, Kudumbasree and the Panchayath whenever they were invited.

Most of the members of the group were trained in other skills also and these helped in building up the Unit. As the members came from various SHG’s they attended those SHG meetings as well. Some of the women in the group were illiterate and one of the members who was an adult education volunteer during the Literacy Programme of the Government of Kerala started voluntarily imparting adult education in the Unit as well as some women in the other Kudumbasree Units as well.

The members of the group were given the following training during the course of the one-year of their work.

- Paper bag making – various designs, papers, sizes
- Natural methods of improving the outer look of the bag using vegetable dye.
- Screen Printing
- Paper pulp products making
- Ornaments (Necklaces, Bracelets and Earrings with used magazine / good quality paper
- Paper Pen with Refill – various designs.
- Baskets and Fashionable Handbags using paper – but this is still to be perfected.

Many of the training or the motivation to experiment and produce these were from the Zero Waste Centre. The interesting aspect of this Unit is that they have a good knowledge about the problems associated with plastics use and knows well that the survival of the Unit depends much on the success of the campaign to phase out plastics use, especially plastic carry bags, packaging and other disposables. This knowledge was not acquired by classes or workshops alone but by continuous interactions and as a result of the good relationship that the women have built with the staff at Thanal and the Zero Waste Centre. This relationship was sometimes misunderstood by the Kudumbasree officials, some of whom even asked the women in Pioneer whether Thanal had misappropriated their funds. But as months went by and the success of the unit started showing, the critics were silenced.

The news about the Unit and their success was much covered in major dailies and news
channels including the Hindu, Business Line, The New Indian Express, Mathrubhumi, Doordarshan etc. Many important dignitaries have visited the Unit and encouraged them with their support. The Tourism director Mr Alkesh Kumar Sharma was an early visitor and was quite pleased with their performance. He gave an order for paper bags worth Rs. 1 lakh and also granted Rs. 10,000 for training programmes. The Member Secretary of Kerala State Pollution Control Board, Mr Indulal also visited the Unit and donated two benches after he found the women working on the floor. Ms Usha of Thanal also donated them a table. Many people from both within the country and outside have come to the Unit and encouraged them. They have also learnt a lot from them. The Pioneer Paper Bag Unit stands as a symbol of hard work as commitment to a cause, which has also resulted in opening up the markets. The President of the Panchayath, the Ward member Mr Binu and the Kudumbasree officials have also been of much support and encouragement.

**Performance:** In the initial stages, the women really struggled to get orders and earn anything. But this was the final life test. It was felt that at some point the women will not be able to hold on. This was because there was immense pressure from their families about working without getting any returns. Till July 2003 the women could not share any amount as profits or wages. But they continued to work, and gradually it began to pay off even though not in substantial terms. In one year from January 2003 to January 2004, the women were employed up to 275 days. But there were members who attended only for 116 days. In one year they did a good show of business for nearly 1.2 lakhs and in another 6 months they had crossed Rs. 2 lakhs in total turnover. Yet, after paying back loans and a profit of Rs. 37,000 the women could take back Rs. 20 to Rs. 25 per day of work in each month. Till December 2003 they had withdrawn Rs. 75,000 from the loan account and paid back with interest nearly Rs. 40,000.

The Secretary of the Unit has been very careful in running the finances of the Unit and has managed to convince others as to the need to pay off the loans as soon as possible so that they can be better paid sooner. Her acumen as well as the quality of the rest of the women as managers or specific masters in tasks have improved so much so that now the Centre runs independently with very little support or intervention except for some market and material promotion support.

The Unit produces and supplies standard-sized and ordinary-shaped paper bags, to replace plastic in the market place and also special bags ranging from Rs. 1 to Rs. 100. Slowly, as they have gained confidence, they have started experimenting with their ideas, and developed innovative paper products; they now make bags of all shapes and sizes, and their repertoire now encompasses all kinds of products – including paper beads woven into jewelry! They have started processing commercial orders too like supplying paper bags to be used as disposal bags in Hotel rooms. They’ve been getting orders for Workshops and Seminars and by the Tourism department

The Pioneer women claim that through this paper bag unit they are trying to educate themselves and the society in which they live on how to use a material, how to reduce waste and how we can make use of some of the valuable discards that we call ‘waste’. They have started to realise that what is called garbage is actually a resource and they can make a dignified living out of it. Through their personal experience during the last one year (of working on this material and trying to do promotional activities and campaigns) they also realize that women can make a distinct change in the society.

Personally the women use only paper bags and try to educate their children and other family members about the problems of plastics and how they can get rid of it from their lives and thus contribute in a small but significant way to protect this fragile earth. They feel that their work and the change in attitude which it brought to them should spread to other areas so that more women can join to bring a change, and thus leave this world much more beautiful than we got, to our children. For this they have jointly proposed with Thanal a programme to convert the Muttackad Ward as a Zero Waste ward.

5.9 BUSINESS DEVELOPMENT AND SUPPORT PROGRAMME

In 2003, two other developments that led to some shift of focus in the Zero Waste work, was the massive resource crunch faced at both the Centre and the parent organisation Thanal. Support for the programme was pouring in from the Association for India Development and the New World but
unfortunately Thanal did not have the necessary clearance to receive the foreign remittance. Moreover, the organisation was registered only as a Charitable Society and many of its founder members were at present not associated with its work. Given these conditions in December Thanal registered itself as a Public Charitable Trust and based its work on Environmental Health and Environmental Justice. It could start institutions and Zero Waste Centre was brought under it.

Much streamlining of activities happened and two main reasons led to the development of a programme for supporting enterprise building in the community and market support for them. The Business development and Support Programme started as an integral part of the Centre, and functions since February 2004. A team comprising Mrs.Chandni Krishnan, an ex-manager at the ITDC Hotel and Mr.Dileepkumar N, a marketing person took primary responsibility for the programme. The purpose of the Business Development and Support Programme (BDSP) is to:

♦ To promote environment friendly products as part of the Centre’s activities - This will be both a campaign and business development

♦ To develop and establish a visible material substitution programme under the zero waste campaign

♦ To raise funds to support the promotion of Zero Waste ideas and ideals – through both sales promotion as well as fund / support

♦ To encourage supporters of the programme to invest their money on a small interest (equivalent to prevailing public bank interest)

♦ To generate necessary funds for the running of the BDSP and repayment of the Trust Funds with interest for the investment.

♦ To support product and design development activities and events.

♦ To support the enterprises develop their own market promotion programmes and help the women become adept in dealing with market issues.

The focus was also on collecting available information regarding the products that are to be promoted and documenting the same for future reference. The target markets were identified as

1. **Events:** All major events within Kerala will be seen as a potential market. The strategy would be to approach organizers offering to make the events Zero waste and also promote the products.

2. **Exhibitions:** All exhibitions sponsored by other organizations will be attended. Exhibitions will also be organized on a regular basis at the local level.

3. **Organizations and individuals:** Orders will be solicited from Institutions like hotels and restaurants, companies, Advertising agencies, event managers, Government Offices, hospitals, clubs etc. Networking opportunities like meetings, the Organic bazaar etc will be utilized to reach out to individuals.

An initial investment of Rs. 2.5 lakhs was given by Mr Harish Murukanandhan, a software professional working in the United States but very interested in our work and also one of the Trustees of Thanal.

This programme has been able to streamline the demand-supply system but the process is its nascent stage and is too early to evaluate. Early evaluations of the system has pointed to a failure due to excess of expenses in running the programme and ways and means are being worked out to bring down the costs of running.
Zero Waste Kovalam is an attempt to implement Zero Waste concepts in a typical area in Kerala. Here Kovalam is a traditional village and a developed beach destination. The programme was conceived and launched as a fall out of an anti incineration campaign. In three years it has grown into a model for many. It was drawn focussing on building capacities and relations among the local community, lobbying for policies, generating clean and sustainable employment through discards recovery and material substitution programme. Ecology Centre, Berkeley and Global Alliance for Incineration Alternatives provided technical training by supporting Shibu K Nair, one of the researchers in this project. While the programme is founded over the three basic principles “Efficiency, Economy and Ethics”, it has achieved some interesting and unique gains. The programme has trained about 400 women and reached out to create about 100 new jobs, primarily for women who are from poor families. The Materials substitution programme has trained both women and youth in the locality to produce environment friendly products using local materials to replace many of the disposable plastic materials use, especially in business. Zero Waste Kovalam could also achieve marked changes in the attitude of the local community to waste. Zero Waste Centre, which was established as a training and resource centre has been able to disseminate the lessons learned from Zero Waste Kovalam to local self government, institutions and public as an economically and ecologically viable way of handling waste, help build relationships and partnerships among various stakeholders. Although individuals and institutions can do a lot on their own, the major point raised by the activities at the Centre and the project is that even though waste is seen as a public health issue that only the government can address in a comprehensive and effective manner, there needs to be a fundamental shift in the way we see waste and its management. The government and the people needs to shift from waste management into resource management. And this in turn is a major step in redesigning employment opportunity development and society building.

The relevance of zero waste as a planning approach in Kovalam, Keralam?

The gravity of the situation in Kovalam demands drastic steps from every one—to alter our behaviour and establish practices locally to address global problems. But these drastic steps need not be the violent moves of development that Governments spearhead as a reaction to political aspirations. One of the supporters of this project Saraswathi Chandramouli once wrote about Buckminster Fuller, a holistic genius inventor of the 20th century, who developed the Dymaxion Map of the earth. This is the only flat map projection of the entire earth’s surface that reveals the planet, as it is – one island surrounded by one ocean. He wanted to effectively convey to all of humanity the total earth as an entity not “disassociated, remote and self-interestedly preoccupied with the political concept of its got to be you or me; The idea was to convey that there is not enough for both. The aim was to visualise, humbly, that our actions locally do indeed have global consequences and that there is enough for all. The models of technological development we are currently exposed to creates a false sense of deprivation and a very real ever widening gap between the haves and the havenots. In Kovalam it is felt that it is this deprivation that is being challenged by the important task of building a thriving sustainable zero waste society.


A wonderful opportunity for the community in Kovalam surrounded by big businesses of tourism and the serious deprivation of resources and livelihoods is to be empowered and be part of a process to live in an equitable, just and ecologically friendly village. Each and every member of the community has a role in this effort. A commitment to ZW is a life long process. The current system rampant in our society has been built on decades of infrastructural reinforcements. The solution to get out of this will require decades of community based reinforcements of relationships, faith and co-existence. ZW will prove itself to be self-reliant but this is not expected to happen easily. The most important barrier that will have to be resolved is education and awareness among locals and visitors on the ZW
concepts/commitments and also, the economic, administrative and policy-regulatory barriers to ZW. For this every one has to be committed to the ZW process. We have to provide feedback on how we perceive the issues and in what way we would like to be part of the ZW solution. This means local solutions have to be generated synergistically. There are no generic answers only customised solutions specific to the Kovalam community. There is experience and networks available to make ZW a success in Kovalam. It would be vital to tap into these available resources so as to avoid mistakes encountered on this path and not reinvent the wheel.

One of the greatest challenges in the coming months is creating a democratic process for the involvement of the residential and the commercial Kovalam community on developing locally based initiatives, simple technologies and solutions. There is apt to be distrust, apathy due to hopelessness, polarisation and lobbies opposing ZW. How best to bring together disparate groups? The ZWK has been attempting this with varying success. For those who wish for a ZW Kovalam, conflict prevention and resolution are key skills to acquire, sharpen and practice. This also needs to be developed. The path towards ZW is to be built on persistence, patience and participation.

6.1 ACHIEVEMENTS OF THE STUDY

The main objective of the study could be categorised into four

1. Documenting the programmes vis-a-vis the employment generation
2. Conducting surveys and research into the present system as well as exploring possibilities
3. Supporting the programme in its activities especially in conceptualization and then in its development
4. Analysing the results in this mid-process stage

The project could achieve much of this even though the researchers who were also involved with the ZWK programme had to turn around a number of times to drop some of the objectives and take up other new needs that emerged during the project period. But the researchers are unsatisfied because the programme is still going on and is in its major transition stages and we had to stop and write this report at a point when many changes are happening and serious review is in process as regards the movement of the programme.

Nevertheless the study clearly bring out the following facts

1. That income and employment are two different notions. Income is real and easily measurable but does not reflect the only aspiration or need of the community, families or individuals, while employment is a more generalised need, an aspiration that encompasses not just the financial aspect but also the livelihood aspect. Employment is a state of the living, and a state of the mind – rather a feeling still real and measurable.

2. That the present paradigm of development, such as is seen in tourism in the area, triggered by external factors have not been able to satisfy the demand of the local community, has been exclusive and has not provided for the protection of the rights and values of the local community. This conflict has also grown into developing wrong or negative qualities of an exploitative mentality in the local community and has affected the security of the individual, especially the women. It has also affected the perception of the youth regarding employment (and livelihood), inducing in them a demand (a greed) that the system is not able to supply sustainably.

3. This paradigm further infringes into the resources of the local community there by creating a large conflict, and also the struggle for an individual to be employed changes form and becomes
tougher.

4. The paradigm also encourages wastage of resources by those sections, especially the businesses and the growing sections who have the power and the finances to buy, use and waste, as they are in a invest and gain mode of business. But this wastage is naturally at the cost of the underprivileged who have to struggle to gain even a decent employment.

5. This also leads to further deterioration of the type of employment, including generating employment that is less dignified which will be offered to the underprivileged to take or leave. It also forces on them a mentality of dependence (more like a slave) rather than a relationship that is dignified. This is a socially disturbing phenomenon, which has already set in.

6. The Zero Waste Kovalam program though addresses one of the end issues of such a system, ie., waste, attempts to move up the cause chain and addresses all the issues that led to the deterioration.

7. Through the Zero Waste Kovalam programme attempts have been made by the proponents to bring together the community especially women, build capacities in them and empower them to address issues hitherto unaddressed.

8. These issues are not just about employment, but also about the politics of development and sustainability, with specific focus on gender issues.

9. It is also seen that while Poverty Alleviation Programmes of the State government also talks about employment and empowerment, real empowerment is a process where the women is seen in dignity within the family and outside as well.

10. Even as these programmes have specific training for employment generation, what is important is to develop in these groups the foundation on which they have to build their enterprise – some of these are better management capabilities, better accounting and promotional capacities, better conflict resolution capacities, and a strong understanding of their strengths (including gender). There has been a emphasis on these in the ZWK programme.

The main achievement of this action research has been the research input provided by the researchers as part of better understanding developed in the process. This has helped a lot in the evolution of the programme.

6.2 LIMITATIONS

While the projects set out to achieve the objectives, one serious limitation of the research has been that many of the objectives were driven by the need of the programme during its execution. This necessitated changing the objectives more often. The ZWK is an on-going programme and the project study was to be for two years. It is expected that Kovalam could be declared a Zero Waste destination by 2006 end. Much work needs to be done, and the present documentation and analysis is a mid-project one. It does not talk about how the project will go on. At each point there are serious review processes, and hence the project could take turns unexpected and different from the frame proposed originally.

Some of the surveys that the researcher wanted to do had to be avoided, and data collected from the employment surveys has been used in a descriptive manner rather than as hard data. This was necessitated owing to the context of the study, namely studying the process. But the data thus collected would be used as a base line that would be helpful at a later time as a reference in future surveys and auditing.

Overall, within the limitations of the researchers being involved in the project as
6.3 ZERO WASTE AND SUSTAINING LIVELIHOODS – A HOME-BASED, MATERIALS, SKILLS AND RELATIONSHIPS APPROACH

A better quality of life for future generations is the principal aim of a sustainable development strategy. Protection of the environment, a sustainable level of economic growth and employment, and social progress which meets the needs of everyone are key elements of such a strategy. But unless we human beings learn a fourth component - more prudent use of Earth’s natural resources - it is highly doubtful that the other three can be achieved. (Michael Jessen, The Ripple Effect of Zero Waste)

Kovalam village is not different from other villages of Kerala, except that it caters to the needs of a tourist population because of its fame as a tourism destination. In addition to the waste produced by the villagers, large amount of waste is generated by the tourists. This waste includes both biodegradable and non-biodegradable wastes. Dumping or burning of these wastes has created many problems for the tourism industry and the lives of local community.

In this context studies and experiences on waste issue in many parts of the world should be giving us wisdom to solve this problem, the manifestations of which are very recent for us. The attempt is to adapt the highly invigorating concept of zero waste – meaning the most ethical, economical and efficient resource use. What the communities need to identify is that there is no such a thing as waste and that every small piece of material has a value and can be used again and again. Starting from this simple change of attitude, communities (starting with individuals) should reorder their thoughts and economize their lives in sustainable and non-hazardous ways.

As traditional employment such as agriculture becomes less productive, and employment in the sectors like tourism has not actually come, we need to see the system and approach it differently. The zero waste thought is to revitalise and base the industry, development and livelihood on the relationship with the environment and with one another.

A process based on such a perspective must address certain issues. The traditional systems of livelihoods developed evolutionarily over decades or even centuries have a production-marketing-consumption system based on natural and local resources (locally available or made available) and relationships built on the same. But as these face a crisis induced by factors that are external and out of their control, the displaced from these sectors look out for other means, that are easy and that may not need much skills. The new generation job markets built by the businesses such as tourism has been able to offer such options, to some extent. But the displaced have to migrate, move away, adapt to new locations or new jobs and find new survival strategies on how to access new jobs and resources. For instance, women involved in copra processing or coir making when they shift to house keeping, cooking and other work, naturally there will be two losses - financial losses and also loss in terms of dependency factor and the risks and impacts involved. Businesses such as tourism have not protected them with either of these and do not use their traditional skills and expertise. Neither has the system been able to incorporate and include them with their needs and their skills. The space for such sectors in the tourism development are unfortunately defined by the developers who are mostly people who have nothing to do with either the locality or their livelihoods. So in effect not only has a traditional livelihoods been destroyed, but the system has not been able to include them or provide them compensation or retraining or reemployment in upcoming sectors. Moreover, because tourism is an organised sector established for the high-income high-spending group (especially from the western countries), unlike the traditional industry in the informal sector, it is known that the deterioration of traditional communities and their activities is faster and the upward mobility slower, even while the growth of the tourism industry is faster.  

26 Shirley Susan and Anand Bala, The Unseen Host, Eq-NF, Volume V Issue I March 1999, Equations
In Kovalam, it is quite visible that the debacle of the traditional sector and the marginalisation of the landless or those who do not have access to other resources (including jobs) have affected the quality of life in the area. On the other hand, the growth of the new tourism sector has benefited only those people (families) that were ready to shift and take the opportunity. But a deeper look will tell that they were also in possession of land, which they converted to the new use. Even after thirty years of tourism development, there is abject poverty in many of the families living in the backyards of the tourism area. One can imagine such a situation with all the negative impacts of tourism - waste, cultural degradation, insecurity etc induced into their lives and surroundings. In such a situation the marginalised and the poor consisting of these traditional artisans, fisherfolk, agriculture workers, landless farmers, small traders who lost their trade, women etc depend on the various schemes of the Government and the panchayaths like the poverty alleviation programme (Kudumbasree Mission) for upliftment. Governments have claimed that through tourism and such new sector development, they are also looking at women and the marginalised to be trained and employed. But institutions such as the IHMCT or the KITTS and even the many Catering and Food institutes are even now out of access to these rural poor, especially women. So, their entry into the organised tourism industry is a difficult, rather impossible path. The Tourism policy of the State and the country has nothing specific addressing these matters. The implementation mechanisms (the departments) are always seen improving infrastructure, developing promotional materials and going out and out to woo the traveller.

The Zero Waste Kovalam project can be seen as an important step in the direction of equitable, safe and just sharing of benefits at the same time an attempt to empower women and local community to take control of their resources and conceive development based on their needs and aspirations. Being a tourism destination and working on waste issues, the materials use policy is addressed and here the community groups who start producing sustainable materials also runs a campaign to change materials use in the destination. This effects a change in approach of the business, by asking the developer and the planner to join the process of a development agenda that should be set by all the sections of the community.

In Kovalam even as tourists demand products and services, and developers build them to improve the “catch”, what must define the policy of tourism or for that matter any development initiative in the area must be the needs of the people and their perceptions of development. The policy must also be based on what must be the benefits, who should benefit and how these benefits need to be shared.

Generating employment with the focus of benefiting the area through better materials use, better ethical practice and building relationships with all the people and environmental elements is not only a productive process but satisfying and emancipating. And if this empowerment is brought into the women’s lives then its has an additional influence on the power equations, social dynamics, growth and the future (children).

The programme and its study has shown that any community wanting to sustain livelihoods in socio-political system as in Kovalam (and possibly in Kerala), has to base themselves on developing skills, build capacities of diverse kinds, promote and strengthen traditionality and family or cottage based industrial setups. Institutions such as the panchayaths and NGO’s can be the strong institutions needed to support such an effort of the community.

This study has only done a rather inadequate documentation of such a process, if one looks at the effort put in the ZWK programme, but the researchers see this as a starting of a process of analysis which is sure to lend a better, clearer understanding of waste (read development impacts) and employment and the way forward in planning a sustainable community revival programme.
APPENDIX 1

Kovalam Location and some Facts

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</tr>
<tr>
<td>Rainfall</td>
<td>170 cm.</td>
</tr>
</tbody>
</table>

**TEMPERATURE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mean – Maximum</td>
<td>Mean - Minimum</td>
</tr>
<tr>
<td>(Summer)</td>
<td>36.2 c</td>
</tr>
<tr>
<td>(Winter)</td>
<td>35.0 c</td>
</tr>
<tr>
<td>(Summer)</td>
<td>20.6 c</td>
</tr>
<tr>
<td>(Winter)</td>
<td>18.0 c</td>
</tr>
</tbody>
</table>

**ADMINISTRATIVE POSITION**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Village</td>
<td>Kovalam</td>
</tr>
<tr>
<td>Local Government (Panchayath)</td>
<td>Vizhinjam Grama Panchayath, Venganoor Grama Panchayath and the Thiruvananthapuram Corporation</td>
</tr>
<tr>
<td>Revenue Administration Division (Taluk)</td>
<td>Neyyattinkara</td>
</tr>
<tr>
<td>District</td>
<td>Thiruvananthapuram</td>
</tr>
<tr>
<td>State</td>
<td>Keralam</td>
</tr>
<tr>
<td>Country</td>
<td>India</td>
</tr>
</tbody>
</table>
APPENDIX 2 - PHOTO PROFILE

Biogas Plant at the Light House Beach
- A Biodegradable Discards recovery system for hotels

Resource Recovery Facility at IHMCT
- Discards Storage Room

Resource Recovery Facility at IHMCT
- Sale of Discards

Resource Recovery Facility at IHMCT
- Sold Discards being transported by Discards Resellers
Coconut Shell Products made at the Zero Waste Centre

Training for Coconut Shell Production - at the Zero Waste Centre

Pioneer Bag Unit members teaching paper bag making to Matt, an Intern from GAIA
Kovalam Cleanup - periodically done to improve current conditions in Kovalam

Garbage Burning and Dumping
Paper Bags being distributed to Shops in Kovalam

Children learning to make their own toys at the Children for a Toxic Free world camp at the Zero Waste Centre

Children for a Toxic Free World - programme at the Zero Waste Centre

Alkesh Kumar Sharma, Tourism Director visiting Keerthi SHG’s Organic Farm
APPENDIX 3

Opinions from Shop Keepers of Kovalam

1. ATTITUDE

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Category</th>
<th>Numbers who opined</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are even willing to help financially or any other help</td>
<td>A</td>
<td>8</td>
</tr>
<tr>
<td>You are also going to fail!</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Some Italian tourist protested loudly when they saw waste being burnt</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>No one is thinking seriously about this issue</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Many times tourist have come to stop open burning; They have even poured water on the burning pits</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Tourists regularly complains about waste problem</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Travel agencies are willing to campaign for waste management and to distribute notice and brochures on zero waste</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Four or five years back one foreigner employed a person to keep the beach clean.</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Shop owners employs persons to clean the canals once in two months</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>One hotelier asked what is the half life period for PET bottles? What can be done with PET bottles?</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

2. COMPLAINTS

<table>
<thead>
<tr>
<th>Complaint</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Tourists create more problems than foreign tourists</td>
<td>C</td>
</tr>
<tr>
<td>No help from the Panchayath</td>
<td>C</td>
</tr>
<tr>
<td>Some of these problems would not have occurred if the Hotel and Restaurant Association would have managed waste</td>
<td>C</td>
</tr>
<tr>
<td>No help from the tourism department</td>
<td>C</td>
</tr>
<tr>
<td>Hotel and Restaurants association, Panchayath, Dept of Tourism have been at it forages: The problems are in the legal deadlock</td>
<td>C</td>
</tr>
<tr>
<td>Local politics has affected any action</td>
<td>C</td>
</tr>
<tr>
<td>Some people in the tourism department are trying to mislead the people of the area</td>
<td>C</td>
</tr>
<tr>
<td>Tourism Information Officer and Panchayath member are responsible for playing games here</td>
<td>C</td>
</tr>
<tr>
<td>Room tariffs are not standardized. Many tourist are fooled</td>
<td>C</td>
</tr>
<tr>
<td>Auto drivers are fooling the tourists</td>
<td>C</td>
</tr>
<tr>
<td>The Police is not fining people who litter/ pollute</td>
<td>C</td>
</tr>
<tr>
<td>Department of health has not come for any inspection</td>
<td>C</td>
</tr>
<tr>
<td>Health certificate is a must for giving permits: It is not being followed</td>
<td>C</td>
</tr>
<tr>
<td>Current waste management inadequate</td>
<td>C</td>
</tr>
<tr>
<td>Electricity charge is very high in Kovalam Rs. 9/ unit</td>
<td>C</td>
</tr>
<tr>
<td>Hotel and Restaurant Association had suggested take back policy of PET bottles two years back. Don't materialize</td>
<td>C</td>
</tr>
<tr>
<td>ITDC lets sewage water to the sea- this should be stopped</td>
<td>C</td>
</tr>
<tr>
<td>The money spent for the Park and foot path by Dept of Tourism (Rs. 20Lakh) have been siphoned by an earlier Tourist Information Officer</td>
<td>C</td>
</tr>
<tr>
<td>Casualness, irresponsibility and inefficiency from Dept. of Tourism in Waste Management</td>
<td>C</td>
</tr>
<tr>
<td>The future generation and their needs are not included in tourism planning</td>
<td>C</td>
</tr>
</tbody>
</table>
The menace of mosquito started when ITDC started operating its hotel at Kovalam
The quality of food served in Hotel Ashoka is very poor. The tourists who are staying in Ashoka goes to other shops for food.
Some hotels are pumping their liquid waste public drainage canals and finally reaches the sea.
The Pond near Ashoka hotel is full of waste.
ITDC is dumping their waste in their compound. And sometimes into the sea. One can see huge heaps of waste there.
Insufficient drinking water supply
Police is not showing interest in waste management
The operations of hotel and restaurant association is not satisfactory

3. CURRENT WASTE MANAGEMENT PRACTICES

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>PET bottles are tied together in a gunny bag, compressed and burnt with kerosene oil</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>Hotel and Restaurants Association dumps or clears waste from November to April only: The rest of the year the hotels arrange labour to transport waste</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>The current waste management is targeted to chartered tourist only</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>The packaging waste from shell shops are burnt near the pond and the ash is being dumped into the pond</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>Concrete rings have been built to collect waste and burn</td>
<td>M</td>
</tr>
<tr>
<td>6</td>
<td>Pits are used to dump the waste. After getting it dried people burn the waste</td>
<td>M</td>
</tr>
</tbody>
</table>

4. GENERAL OBSERVATIONS

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Since the shops has to pay Rs. 3500 as license fee in the Panchayath, Panchayath has to be responsible</td>
<td>O</td>
</tr>
<tr>
<td>2</td>
<td>For big hotels the waste problems have not affected tourist flow because they have land</td>
<td>O</td>
</tr>
<tr>
<td>3</td>
<td>Majority of tourists that come here are ordinary people. They prefer small cottages over posh big ones</td>
<td>O</td>
</tr>
<tr>
<td>4</td>
<td>I have been impressed by the Greenpeace campaigns on nuclear testing and anti whaling</td>
<td>O</td>
</tr>
<tr>
<td>5</td>
<td>Kovalam is dying because of the peoples greed</td>
<td>O</td>
</tr>
<tr>
<td>6</td>
<td>Hotel waste is the main problem so Hotel and Restaurant Association is responsible</td>
<td>O</td>
</tr>
<tr>
<td>7</td>
<td>There was tourist flow throughout the year 10 years back</td>
<td>O</td>
</tr>
<tr>
<td>8</td>
<td>Big hoteliers are not interested in common waste management policy- have their own mechanism</td>
<td>O</td>
</tr>
<tr>
<td>9</td>
<td>Use of mosquito coils and nets common – 10 years</td>
<td>O</td>
</tr>
<tr>
<td>10</td>
<td>Waste has increased due to increased use of luxury items</td>
<td>O</td>
</tr>
<tr>
<td>11</td>
<td>Waste problem is more in the backyard than in the front</td>
<td>O</td>
</tr>
<tr>
<td>12</td>
<td>Concern on Vilappilsala</td>
<td>O</td>
</tr>
<tr>
<td>13</td>
<td>The problem of waste is right from when tourism started but not visible as on date</td>
<td>O</td>
</tr>
<tr>
<td>14</td>
<td>One truck load of mineral water of a single company is being sold here (12000 bottles) in one week</td>
<td>O</td>
</tr>
<tr>
<td>15</td>
<td>All the waste paper goes to Tamil Nadu for recycling. We are loosing our opportunity.</td>
<td>O</td>
</tr>
<tr>
<td>16</td>
<td>People demands plastic covers since it is a symbol of dignity and decency</td>
<td>O</td>
</tr>
</tbody>
</table>
The majority of the tourists coming to Kovalam belong to low budget class. They live in low rented houses and cooks food for themselves.

ITDC is most ill treated institution in Kerala tourism.

Nobody is collecting the tender coconut waste.

The hotel and restaurant association came forward but nothing happened.

Waste problem increase with the increase in use of Plastics.

People are demanding the carry bags as if it is their right.

Earlier even though the number of tourists was higher than current situation, the issue of waste was not as severe as today.

The per capita waste generation of tourists have been increased.

Foreign tourists use less water than domestic tourists.

Foreign tourists denies plastic straws because of its bad taste.

The waste issue became severe with the arrival of chartered tourists.

Kovalam is dead.

On an average a tourist consume 3 bottles a day.

5. PROBLEMS

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Poor drainage system</td>
<td>P</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The problem of space is the biggest limitation: That’s why we dump on the beach</td>
<td>P</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Basic facilities for tourists like public toilets are inadequate</td>
<td>P</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Drinking water problem is acute: do something</td>
<td>P</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Mosquito a major problem</td>
<td>P</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The waste buried on the beach comes out when the beach is eroded in Monsoon</td>
<td>P</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>No pure drinking water due to poor drainage facilities</td>
<td>P</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Earlier, segregation of waste was a practice, now everything is mixed up and dumped</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The biggest problem is of PET bottles: We don’t know what to do with them</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Our neighbours dump waste on us</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>The waste problem must be solved on a war footing: Or else it will kill Kovalam’s future!</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Shop owners are 100% responsible for the waste problem</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Jealousy or rivalry amongst shop owners are the cause of why nothing has happened</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Over crowding of shops in a limited area</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Foul smell of degradable create problem to the tourists – smell is the problem</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Foreign tourists complain of itching and related problems due to mosquito</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Waste is dumped between rocks in the light house beach – main place</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Black sand fills the beach during the last few years. White sand is taken away by big hotels to put in their courtyards. This actually kills the beach</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Many tourists cut short their stay/visit and return because of the waste problem</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Footpath spoils the natural beauty of the beach-tourists complaints</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Garbage and beach sellers are two important problem in Kovalam</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>People have to depend on water brought in tankers but not dependable.</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Earlier tourists used to stay a month or more but now shortens the stay for two or three days.</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>3 foot deep canals are filled with plastics now.</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Plastic burning is a big problem- our survival at stake</td>
<td>P</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The shop owners are dumping the mixed waste on the rocks in night.
The pond near the ‘lonely planet’ is full of pet bottles and waste.
Waste killed the farming of paddy.

6. **SOLUTIONS**

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>The waste should be taken some where: It should not litter the beach</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Panchayath should take up the waste management in Kovalam</td>
<td>S</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Tsm Dept and Panchayath should start the waste management. Others will follow</td>
<td>S</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Open burning is the best option</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>If there were space we could have dumped it or burn it</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>May be we should recycle PET Bottles</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tourism Department must take the initiative. The others will help and cooperate</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Waste Management factory must be built in an uninhabited place</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>A new technology must be introduced to solve all problems</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>There must be arrangements made by Hotel and Restaurants Association to collect wastes in off season also</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hotel owners should take up the leadership to solve this issue</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>All must be ready to invest in waste management programme</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Panchayath and Tourism Department should keep apart a fixed amount for waste management</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Keep all waste in a common place. Give it to Corporation</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>There should be a total waste water treatment facility for Kovalam needed very badly</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>To get the visitors stay in the region solve the waste issue</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Visible cleanliness is a must atleast</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Waste should be taken to Vilappilsala.</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Place waste bins by Tourism department and Corporation</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Use old plastics for road construction</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Create underground tanks to landfill plastics</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Make bricks with plastic waste. Grind it and mix it with sand to make bricks. It is better than open burning.</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Government is a failure to take up waste management. Only private entrepreneurs can manage it effectively.</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Proper technology should be brought in to recycle PET bottles</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Reduce the charges at comfort station</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Use aluminium cans to pack soft drinks and replace plastic bottles</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

7. **ZERO WASTE SOLUTIONS**

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Public awareness campaign necessary</td>
<td>Z</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Every shop must keep a ‘waste box’</td>
<td>Z</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>There should be a fine enforced on dumping in public places</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>“Take –Back policy’ must be implemented with mineral water manufacturers</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Ban Plastic Bags</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Waste management must be perennial and permanent</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Tins, plastic bottles can be re used for other purposes</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Schools should be the starting point for solving the waste issue</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Dumping on public places must be stopped</td>
<td>Z</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>We should take care to reduce waste: that should solve most of the problem</td>
<td>Z</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Take care of your own waste</td>
<td>Z.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Any scheme of waste management must be based on peoples participation</td>
<td>Z.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Domestics should be taken care of by providing affordable neat comfortable rooms</td>
<td>Z.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Unemployment is a problem here: What you do must create jobs for young people here</td>
<td>Z.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Water treatment plants must be made mandatory for all hotels</td>
<td>Z.</td>
<td></td>
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<tr>
<td>16</td>
<td>There should be proper facilities to collect waste from waste bins</td>
<td>Z.</td>
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<tr>
<td>17</td>
<td>Ban PET bottles to carry mineral water</td>
<td>Z.</td>
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<tr>
<td>18</td>
<td>Give waste to local piggery (Vegs, fish and meat waste)</td>
<td>Z.</td>
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<tr>
<td>19</td>
<td>Segregation enforcement</td>
<td>Z.</td>
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<tr>
<td>20</td>
<td>All recyclables should be recycled</td>
<td>Z.</td>
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<tr>
<td>21</td>
<td>Mechanism for waste water removal</td>
<td>Z.</td>
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<tr>
<td>22</td>
<td>Good water be made available exclusively for tourists</td>
<td>Z.</td>
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<tr>
<td>23</td>
<td>Punishment for those who break the laws</td>
<td>Z.</td>
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<tr>
<td>24</td>
<td>Waste management linking up with decentralized planning</td>
<td>Z.</td>
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<tr>
<td>25</td>
<td>Participation and awareness of Panchayath, tourism department and people together essential</td>
<td>Z.</td>
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<tr>
<td>26</td>
<td>Generation of waste must be punished</td>
<td>Z.</td>
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<tr>
<td>27</td>
<td>We need a permanent waste management system</td>
<td>Z.</td>
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<tr>
<td>28</td>
<td>Use power to stop the waste menace</td>
<td>Z.</td>
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<tr>
<td>29</td>
<td>Each management should have its own waste management system and a fine to be introduced when it is not working</td>
<td>Z.</td>
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<tr>
<td>30</td>
<td>The function of the Panchayath should be improved</td>
<td>Z.</td>
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<tr>
<td>31</td>
<td>Construction rules should be implemented to curb mushrooming of illegal constructions</td>
<td>Z.</td>
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<tr>
<td>32</td>
<td>Dumping in open wells to be banned</td>
<td>Z.</td>
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<tr>
<td>33</td>
<td>Plastic is the menace and curse. Bring immediate ban on plastics</td>
<td>Z.</td>
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<tr>
<td>34</td>
<td>The environmental consequences and health hazards of waste disposal methods should be considered</td>
<td>Z.</td>
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<tr>
<td>35</td>
<td>Each one in Kovalam is responsible for the waste problem</td>
<td>Z.</td>
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<tr>
<td>36</td>
<td>Without segregation waste problem cannot be solved</td>
<td>Z.</td>
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<tr>
<td>37</td>
<td>Decentralised drainage system is required.</td>
<td>Z.</td>
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<tr>
<td>38</td>
<td>Make good potable water available which can replace mineral water and bottles</td>
<td>Z.</td>
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<tr>
<td>39</td>
<td>There should be daily waste collection scheme</td>
<td>Z.</td>
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<tr>
<td>40</td>
<td>Keep big tanks to store pure water from where people can refill their bottles</td>
<td>Z.</td>
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<tr>
<td>41</td>
<td>The awareness should start from within us</td>
<td>Z.</td>
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<tr>
<td>42</td>
<td>Waste management at source should be practiced. This should be inculcated as a culture</td>
<td>Z.</td>
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<tr>
<td>43</td>
<td>There is no readymade solution for solving waste crisis. It should be a slow process with study and awareness and any proper system should take time</td>
<td>Z.</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Strict laws to be put in place to solve the waste problem</td>
<td>Z.</td>
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When avoiding chemical pesticides it is important that the women be taught simple techniques and tips to improve crop productivity, enhance growth, pests and diseases control by using biological and other non-toxic methods, along with the fundamental philosophy of organic farming. Institute for Cultural Research and Action (ICRA) a voluntary group in Bangalore have documented and applied a number of the techniques of Integrated Pest management and Organic farming. Two experts Dr. Ravi and Mr Sreenivas were invited to share their skills among the farmers, especially banana farmers. This skills share was organized on November 17th 2002 at Muttakkad. 31 women belonging to 8 SHGs participated actively in the class and discussions which was organized on the open ground near the organic farm yard led by Keerthi SHG, one of the active SHG of Venganoor panchayat. 2 men who are the members of a SHG too participated in the class. The Panchayath President, Panchayath members Suraja Sudarsanan, Leela Babu, K J Surendranath and other persons interested in agriculture also participated actively in the class. The focus of the class was to how we can do a chemical free agriculture-organic farming, how we can bring back the nutrients and minerals which are very essential for a plants growth, how can we save our crops from the pests and disease without killing the many farmer friendly micro organisms, insects and birds, how can we make our agricultural production cheaper and make farming profitable.

Ravi started with conveying the message that farmers of all range, to the grass root level should acquire knowledge about farming, about pesticides whether they are used or not used, about the plight of other farmers in other states, about the global scenario of agriculture, about trade etc. He raised the concern about the decreasing health status of the farmers, increase in the farmer suicide rates and the threats from globalisation. Usha and Jayakumar of Thanal, translated Ravi and Vasu’s class to Malayalam.

From a farmers point of view Ravi said, knowledge about the pests, soil and microorganisms are very essential. He said only a small percentage of the pests are actually attacking the crops, the rest of the insects are farmer friendly. He quoted, how President Suharto of Indonesia banned pesticides totally to save the spiders in the paddy fields in Indonesia. To gain this knowledge’s, starting a farmer field school is important. (Farmer Field School - FFS- he said is a school without walls). It is a participatory exercise. Through a Farmer Field School one can know the health of the soil, how to develop seed, what is lacking in the soil, how much crop we are loosing, etc. FFS can be conducted in various periods- in the post harvest period or in the replanting period.

Knowledge about pesticides are also essential, he continued. Eg. Application of pesticide to the seed might be seen as harmless; this may give a good appearance to the plant. But in real, the plants grown are least resistant to diseases and it attracts more pests. Also the pesticide in the seed coat destroys the useful microorganism of the soil along with the other organisms.

He stressed on acquiring indigenous knowledge is pest control. There are lot of indigenous botanical pesticides. Eg: neem based pesticides and manure like neem oil, neem cake etc. A women from the group interviewed, with a question, how the application of neem cake will be effective if the neighbours are using synthetic fertilizers.

Ravi replied that the important thing is to start using neem cake and we can hope that neighbours will gradually change. He explained about the advantages of using neem cake and cowdung- the farm yard manure. It can prevent various diseases. He also said about the importance of using the neem cake for a whole area.

On a question about the panama - a disease and attack of nematode, he explained how one can identify the attack of nematode and panama disease and explained the various steps and care...
that should be taken to control them. He repeated the used of neem cake to prevent these diseases.

Ravi and Vasu also told the importance of applying Panchagavyam to the plants. It act both as a pesticide and as a medicine and it enhances the fertility of the soil. They showed how to prepare Panchagavyam.

Ravi continued that there is a huge lack of awareness about the harmful side of pesticides among the consumers. Almost all the vegetables that are available in our market are soaked with many harmful pesticides. On one side there is a alarming rise in the kidney failures, cancers and other ailments which are the end results of pesticide poisoning. It is pity that our doctors are not updated themselves to correlate these ailments with the pesticide residue content in the patients body. He raised his concern about the amount of awareness about pesticides in Kerala among the farmers, among the womens and other common men.

A farmer raised a doubt that even though they are planting 1000 suckers for banana he gets only 10% as healthy ones. Why?

Ravi said putting neems cake to the pits before planting the sucker can control all the diseases affecting the plant. Vasu added that planting marigolds in between the plants can effectively control the attack of nematodes.

The forenoon session was moreover on the various diseases attacking banana, how it can controlled etc. Afternoon session was put apart for other crops. Afternoon session began with a song by Vasu. It was a folk song usually sung by Paniyans of Kasargod. Vasu & Ravi demonstrated how Vayambu can be used for fumigation in controlling the mites attacking coconuts. It can used as a fumigant in food storage godown for the effective control of pest. They also demonstrated the precautionary measures that farmers have to take while fumigating.

On the question of the viral attack the chilly, he explained how the virus attacked the plant through the slit made by an insect during the earlier stages of the plant and the preventive measures like putting nets may be necessary. Planting coriander in between the crop is also an effective method.

He said there should be role of farmers in the policy making especially on those related with agriculture. He was stating the examples in Karnataka, how the fertility of soil was badly affected after the Dams were constructed. When irrigation started the soil became more and more alkaline and now is unfit for cultivation.

Again on the use of biopesticide, he said there are examples of many who are successfully using biopesticides, but the fact is that these information are not getting spread to all. On farmer suicides, he said farmers are committing suicides due to zero knowledge about these various possibilities and experiments that can be done on their fields. Normally farmers who invest more on the fields, gain less and ends up in suicides. Quoting an example, beast disease for paddy has a long history where 100 various pesticides are applied and it could not be controlled. Now too many are being applied without thinking and disease still prevails.

He stressed the need of keeping morality and ethics in agriculture. It is wrong to anticipate greater profit from less land. Such anticipation makes farmer more greedy and pushes him to invest more on fertilizers and pesticides. Ravi shook the crowd off their foot by saying that we took birth to live not to do business. Criticizing the Govt. policy, Vasu said Govt. of India has spend 10,000 crores to control a berry borer which had already affected 200 crops and still it was of no use. These types of pests can be easily controlled if farmers know the period in the life cycle of the pest in which it can be easily destroyed. For all pests there is a particular period in which it can be controlled using biopesticides.

Vasu & Ravi then explained the preparation of various biopesticides using Gerga and chilli, NSKE (Neem Seed Kernel Extract), Turmeric powder & chilli powder and water mix. and Cows milk for many viral diseases.
Vasu also explained about the mode of their work. Their work is based on 3Ts, ie tried, tested and trusted.

Both Vasu and Ravi were repeatedly telling about the need to keep the fertility of the soil. They said that 16-20 types of various minerals are needed for a plant growth, and dried matters is rich with carbon content, green leaves contain more nitrogen, weeds indicate deficiency of certain minerals in the soil. Vasu then explained about the scientific way of preparing compost. They recommended that this land is suitable for heap compost.

One should select the compost type, bio-pesticide with easily available materials and with those that can be collected from our surroundings. These types of selection will make the cost of production cheaper and whatever gains from our efforts will be ultimately profitable for farmers.

In the evening Venganoor Panchayat President Rufoss Daniel and VEO Mohan Kumar joined the class. President encouraged the women to spread the organic farming in the entire panchayath and panchayath is ready for all the help they can do from their part. He assured that panchayath will make all arrangements for the sales of the organic vegetables.
Options available in Waste Management – An Appraisal

Traditionally waste management has always been about disposal. So we have technologies that just dispose waste away. Essentially disposal only does the hiding of waste, either in large holes on the ground – what we call landfills or just burn/incinerate away, where waste is reduced to gas and ash – a process which we will call incineration, but generally adheres to pyrolysis, open-burning, combustion etc. All these technologies are waste disposal technologies. But today we are plagued by some positive tendencies in the society. By experience we are realizing that “We can no more throw away” the waste as “There is no away”. Societies have come to protest against dumping near their living spaces, saying “NIMBY” or “Not In My Back Yard”. Alternatively, there are methods that recover resources. Generally recovering resources from waste is done through recycling. But better that recycling is the process of repair and reuse. Composting/Biomethanation are forms of recovery of resources, of bio-degradable organic waste. The non-biodegradable resources are recovered by recycling industries, and are more a process of a number of activities both social and technical.

Hence, we have two different perspectives, which are not mutually exclusive. Technologies/methods such as land filling and incineration and now a days, in Kerala, even large-scale centralized composting plants was the driving factor in a waste management system in many cities and town. The method generally followed is to simply acquire some land and establish such a centralized plant. Waste is then collected and transported, as it is to the plant and processed. We will call this a technology centered approach in waste management. But there has been major failures in this approach, simply because it did not have people in it. In other words, participation of the public was near nil. Alternatively, there is a process-centered approach. This aims to bring in some sort of integration of the various social, political and environmental processes together along with the various players. The various technologies needed are only part of the process. The main aim in the process-centered approach is to participate the stakeholders as part of a larger process of waste management, where the process as such matters more than just an implementation of technologies. Now let us look at these options in detail to understand the working of the various technologies and processes.

Technology-Centered Approach

While looking at technology, one clearly asks the question – what is ones objective. Traditionally, we have looked at technologies that simply dispose of waste and those that recover resources back from the waste. Let us find out where these technologies stand in the waste management options that are exercised by communities all over the world today and why they are placed such.

Disposal technologies

Landfills

A landfill is a carefully-engineered depression in the ground (or built on top of the ground) into which wastes are put. The objective of a landfill is just a simple dumping place for the waste generated by a town or city or an industry. Since times immemorial, humankind has used burial as a method of waste disposal. It is indeed the most natural, simple and to date the most economical method of disposing of the waste (if one were not to consider the many environmental and health costs that they are known to cause and the enormous resource wastage associated with them). The waste disposal yards in our villages and towns were composting yards since the waste that was buried or used for just filling up got converted to compost, aerobically or anaerobically, depending on whether the waste was left in the open or in closed pits. Composting happened primarily because of the putriciable organic nature of the waste that was dumped or buried. However, increasing population and consumerist culture, the advent of disposable goods, and a proliferation of potentially toxic chemicals in the commodities from plastic bags to batteries, cosmetics and packaging have converted these yards to waste dumping sites. Many of such sites, especially in the developed nations have been declared hazardous waste sites. Now landfills are the least preferred method of waste disposal due to the following reasons.

Ground Water Pollution - Landfill leachate can contain a wide variety of toxic metals and organic compounds: lead, mercury, benzene, and vinyl chloride (a human carcinogen) are just a few
common landfill contaminants. Many older landfills are unlined, and even newer liners can leak. There is no way to estimate the size or potential clean-up cost of a leak before it happens, making ground water pollution economically as well as environmentally risky.

**Air Pollution:** The process of decomposition of the waste interred in a landfill, as well as the waste itself, can release air pollutants in the form of methane and volatile organic compounds (VOCs). Methane is a greenhouse gas, and the US EPA estimates that landfills are the largest anthropogenic source of methane in the United States. Some VOCs released by landfills are known or suspected carcinogens.

**Noise Pollution, Odor Pollution, Blowing Trash, and Visual Pollution:** These are problems faced by the people living and working near landfills and dumping yards. Waste being strewn over by animal activities. Stray dogs, Birds, Vermin, Rodents abound in such landfill sites, and carry the waste to areas around it.

Sanitary landfills attempts to control the pollution by having a bottom liner, a leachate collection system, a top cover and through selection of site considering its hydrology. But the United States of America has found that even the best lined and engineered landfills have had technical failures. The US EPA has found that even the landfills with the best liners will eventually leak. (Peter Montague, quoting US EPA sources, 1987). Compared to designs, implementation and standards in the US, the Indians systems can well be said to be extremely crude. One good example of how we implement control of pollution is the case of Laloor dumping yard in Thrissur. The authorities build a huge wall around the dumping yard to ward of dogs and rodents and at the same time to keep the sight off the people living around. But all such techno-fixes should not be expected to solve the pollution problems.

In Kerala over population and pressure for land has made land filling method become non-feasible. But this has been the most practiced method till date and even now continues. In Kerala there are a number of landfills, all of which are crude dumping yards. All of them have had pollution problems, all of them have people struggling against the dumping, and none of them have been monitored for pollution or any effective pollution control measures taken. Landfills rank second as the highest source of greenhouse gas emissions in the United States (after fossil fuel combustion). (Recycling...for the future: Consider the benefits, prepared by the White House Task Force on Recycling, 1998)

**Incineration**

Incineration of waste is another of those commonly recommended waste disposal technologies. This is a process where by waste is burnt in a machine, under controlled presence of air. Pyrolysis also is a combustion process, where by waste is burnt in oxygen-free or low-oxygen environment. Incineration is supposed to be one of the most hygienic ways of waste disposal and is used widely in developed countries. This technology is seen as a one-shot solution for waste disposal because of its advantages in terms of significant reduction in volume (80-90%), assured destruction of waste, weight reduction, and because it can handle almost all types of waste with ease. The only problem that was considered against it was its operational difficulties, frequent need for repair and maintenance and its high cost of operation. To make incinerators cost-effective, manufacturers started using incinerators to produce energy as well. These plants called Waste-to-Energy plants have also been established in many countries and in India a couple of them are being established.

But during the last two decades, much research has revealed that incinerators are one of the worst polluting machines. The pollution from incinerators are in the form of very toxic gases and fly ash. Gases and ash have been found to contain dioxins, furans, heavy metals residues, which are toxic to environment and human health. Today, incinerators are recommended for Hospital Waste disposal. But even this is objected to by communities and environmental groups all over the world as both Municipal Waste Incinerators and Medical Waste Incinerators have been identified to be the largest sources of dioxins in the world. Dioxins and Furans are extremely toxic chemicals, Persistent Organic Pollutants (POPs) that are formed when any material containing chlorine, especially plastics, paper and pesticides is burnt. One Dioxin – the TCDD (Tetra chloro di-benzo-p-dioxin) is the most toxic substance ever known to humankind. The toxicity of other chemicals are measured as Toxic equivalents with respect to the toxicity of this chemical.
The Stockholm Convention on Persistent Organic Pollutants (POP’s) have shortlisted Dioxins and Furans, both of which are unintentional by-products of anthropogenic activities to be eliminated from the earth. 69% of Dioxins in the global environment is due to waste incinerators. (Dioxin and Furan Inventories: National and Regional Emissions of PCDD/PCDF, UNEP, May 1999). The sources of these chemicals like incinerators are hence targets of phasing out.

In Kerala, though Municipal Waste Incinerators are not recommended, either by the Kerala State Pollution Control Board or by the Local Administration Department, some panchayaths and municipalities did install them and found them to be very costly and difficult to operate.

Technologies that dispose off waste are always end-of-pipe solutions. They are answers to the question “How should I get rid of the waste ? - after the waste is generated and mixed up and dumped. Incinerators and Landfills consume vast quantity of resources which could have been recycled and recovered. These methods need waste (and a wasteful society) to continue operating. Investment in such disposal technologies is investment in continued resource plundering, waste production and pollution. In a resource-starved world, it simply does not make sense to burn or bury paper, organic, matter, metal and other resources, which could be conserved for future use.

**Resource Recovery Methods**

Primarily Resource Recovery fundamentally starts with the assumption that waste is not all waste but only discards from which resources can be recovered. By definition Resource recovery includes all activities of waste segregation, collection and processing which are carried out taking into consideration the economic viability of the material. There are primarily two ways we can do that, but today there are many. Reuse - is a simpler process involving reutilization of material in its end-use form without the necessity of reprocessing and Recycling, on the other hand, involves processing waste through remanufacture and conversion of parts in order to recover an original raw matter.

Resource recovery as a concept is also based on the understanding that there isn’t enough resources – energy, raw material and finances, to go on extracting new and new resources and produce commodities. Traditionally resource recovery is so close to our way of life and thinking. Methods that aim at the minimum utilization of resources and also the maximizing of recovering resources from so called “waste” which is only misplaced resources is central to the way of life in Eastern countries. There are many methods and processes for resource recovery. The most often considered methods shall be discussed.

**Composting**

This is the process of converting any waste that is organic and putriceable into very useful manure (or compost). This can then be used to revitalize the soil. The most important matter in converting the waste organic matter into compost is that it gives back to the earth the nutrients extracted from it while producing food.

Gary Gardner in her book “Recycling Organic Waste: From Urban Pollutants to Farm Resources” (World Watch Paper 135) discusses in detail the need to “close the organic loop”. On one side we have nutrient and organic matter flow out of the agricultural farms and soil, which increases the use of fertilizers leading to a number of economic, social and environmental problems. On the other side, this ends up as consumed food waste and garbage, the disposal of which becomes difficult, in places thousands of kilometers away where it is consumed. This results in costly and polluting disposal technologies, leading to socio-economic and environmental problems. Returning the nutrients in the organic matter of urban waste back to the farm soils would stop this linear flow and “close the organic loop”. This would alleviate much of the problems that arise at both ends of the linear system.

Composting can be taken up in many ways, depending on conditions prevailing such as land availability etc. Some of them are discussed here. Aerobic Composting – which simply means that the microbial degradation of waste is done in the presence of air. Many experiments and variants in technology have been found for this and a number of upgraded and adapted technologies is available. In one such experiment IRTC has used Aerobic Windrow Composting and adapted it to the needs of a small town in Kerala, which generates about 1-5
tonnes of organic waste. Other methods are Trench Composting where the waste is allowed to biodegrade in trenches dug in the earth. These methods are improved upon by adding inoculums both cultured and natural such as cowdung, elephant dung, goat droppings etc.

Vermi Composting – This method of composting uses the assistance of earthworms, which acts as digesters of the waste. The excreta of these earthworms is excellent compost of very high quality. This method is also good for small towns with less than 2 TPD of waste and is adaptable to household levels. It has been established by experiments that the earth this worm throws out (its excrement) is richer than normal by five times in nitrogen content, seven times in phosphate content and eleven times in potash content. (Vasanthrao Bombatkar, The Miracle called Compost, The Other India Press). While this is our natural process and reality, one is shocked to learn that the application of many of the chemical fertilizers, while yielding good crops in short times has actually wiped out earth worm colonies and rendered the soil saline and lifeless.

**Biomethanation (or anaerobic digestion)**

Biomethanation is a process where by organic waste like animal excreta, urban waste, especially cooked and uncooked food materials, agricultural waste is anaerobically decomposed, i.e. in an oxygen deficient environment.

The method of bio-methanation of the organic matter is used mostly in the rural sector. But oft now it is used to convert even the urban waste into resources in two forms. The biogas, a mixture of methane and carbon-di-oxide is a good fuel and can be directly used for cooking or lighting. The gas can also be used to generate electricity by running generators specifically designed for the same. Even though bio-methanation as a process for urban waste is yet to be standardized, the amount of bio-gas well depends on the compostion of waste that goes in to the digester. The waste sludge that comes out after the digestion process is a good manure.

But experiences from composting in Kerala or for that matter in other places in India, especially related to urban waste raises some primary questions. The Indian Government has promoted composting of municipal waste, as is specifically provided for in the Rules itself, but most of the attempts to compost has largely failed. This is primarily attributed to the inclusion of nonorganic material, which has lowered the quality of the resulting compost. Other reasons attributed to the failure are poor equipment maintenance leading to breakdowns and inconsistent production and non-commitment from the City governments to the vision of widespread composting. Gary Gardner also notes that apart from the above reasons the subsidies on fertilizer has made compost economically uncompetitive. She quotes the Indian experience to demonstrate that attention to such fundamental issues is necessary for the success of a composting regime. Moreover, Composting as a process will not stand on its own, and need to be supported with better Public and Governments responses to this, by strengthening the market and research. The farmers also need to be supplied with good quality compost and they need to be made aware of the advantages and social need of using such natural manure instead of the chemical fertilizers.

**Handling the Non-Biodegrdables**

*Segregation:* Segregation of waste is central to any attempt to recover and hence manage non-biodegradable waste. Non-biodegradable waste is generally the waste that is not compostable or recoverable through natural methods. These are metals, plastics, sometimes leather, clothes, construction debris, bottles, toxic waste like medicines and pesticides etc. The diversity and quality of this kind of waste makes it unmanageable if mixed together. Hence they need to be segregated. The best method of segregation that is recommended is the three bucket system – one for the biodegradable discards, the second for the recyclables and third for the toxics and non-recyclables. This kind of segregation ensures that the first is fully recovered as compost or biogas and manure. The second goes to the local recycling market through a secondary materials buyer, and the third need to be land filled securely, with or without pre-treatment depending on the waste, as nothing else can be done with it.

*Reuse/Recycling:* Recycling of the discarded materials is usually done to recover the basic raw materials from the product and to use the same for the manufacture of another product, which can then
be brought back into the market. This is the nearest we can come to mimicking the natural system of cyclicity of resource use. But in practical terms there are a lot of problems one faces in recycling. Presently in Kerala, materials that can be recycled are collected by “akkri” (meaning the discarded items) buyers, who are agents for the Secondary wholesale dealers. These wholesale dealers usually collect and sell these items to recycling units in Tamilnadu, Andhra Pradesh and other states. Kerala does not have many recycling units, except for a few units that buy waste paper and cardboards, for making packaging cards and paper. The ragpickers network, which works totally informally are today the worst of the lot, as they directly pick from waste bins and dumping yards. This makes their job hazardous as well as illegal. A good collection system for recycling can be established if these rag-pickers and secondary buyers are formalized, areas allotted and they be entrusted with the parallel collection of the segregated non-biodegradable recyclable items.

Recycling is a highly positive economic activity. Recycling is also an environmentally beneficial activity as the feed stock to many manufacturing processes would be recyclables rather than virgin material. But this needs more care and planning in collection of the recyclable discards. Also products designed for recycling or remanufacturing can be very supportive for such a system. But recycling has a darker side, which can be easily addressed through better material use and production standards. This is the fact that most recycling is not actually recycling but down-cycling whereby the recovered materials would become feedstock for inferior products. This in effect does not serve the idea of a closed loop system of resource use and also supplies commodities mixed with toxic materials into the market.

Reuse, composting and safe recycling has many-fold advantages when compared to the traditional disposal system. Some of them are that

♦ It conserves resource through lesser extraction, lesser material use and better and more efficient design and manufacture.

♦ Create jobs as this involves a good level of innovation and newer techniques.

♦ Revitalises local economies as most of such activities happen at local level.

♦ Builds communities, as the process towards reuse, reduce, composting and safe recycling involves a lot of social and political process and networks and micro level interdependencies that is part of any cyclic system compared to the linear disposal systems such as landfills and incinerators.

New jobs are created at all points of the recycling loop: material collection, processing and manufacturing. Ranging from low and semi-skilled jobs in materials collection, sorting and processing to highly skilled jobs in the manufacturing sector, these jobs fulfill the diverse needs of different labor pools. Recycled product manufacturing source resources and almost always saves significant amount of energy and water compared to manufacturing with virgin materials, while polluting air and water less. The US EPA reports that recycling reduces air pollution in ten major categories and water pollutants in eight major categories. The energy that is saved if recycling is used instead of virgin raw materials to manufacture glass is 40%, newspaper is 40%, steel is 60%, plastics is 70% and aluminum is a whopping 95%!

Here one other problem that need to be discussed is that of the non-biodegradable and non-recyclable discards. The best example in our context is the omnipresent plastic carry bags and plastic cups. While it is claimed by manufacturers that the currently available plastic carry bags are recyclable, in practical terms this is not possible, as the proper segregation and collection cannot be done economically for safe and financially viable recycling. Moreover, its use and hence disposal has pervaded into the lives of the Keralite in such a way that it is widely believed that strong legal intervention is the most preferred by the people themselves. So people and LSGB’s demand that its manufacture and use be banned, and people start using eco-friendly alternatives – cloth, paper, coir and jute bags. Similar, but slightly different is the case of Poly-Vinyl Chloride (PVC), the manufacture and use of which is being restricted in the European Countries and there is a world-wide concern on this. Many chemicals used in manufacture of PVC products are extremely toxic and they are being banned. One example is the DEHP (Di-
ethyl Hexa Phthalate – a carcinogenic softening agent). This is used in soft PVC toys, tons of which are being dumped into developing countries like India. It has been found that these toys used by toddlers leach DEHP causing health problems.

Moreover plastics like PVC cannot be safely recycled; hence its use defeats the purpose of resource recovery.

**Process Centered Approach**

In the process-centered approach at present there are two processes – the Integrated Solid Waste Management, which is not an entirely new concept and is basically intended to manage waste in an integrated manner, as is suggested by the name itself, and another process which is gaining popularity in many developed countries, especially in the progressive communities, who have seen everything about waste and want to have an end to it. This is Zero Waste – meaning “no more waste” and is rooted on the understanding that “It is not waste that we need to manage but Resources”! Both these are being described here only conceptually though some case studies are quoted within to help understand the process.

**Integrated Solid Waste Management**

Traditionally Solid Waste Management, especially in the developing countries and earlier in the developed countries has only looked at the quick fix solution – which has always been centered around organizational and technical matters. But the production of waste is a more complex process that involves many actors and activities. Therefore a solution to solid waste may not easily work out and more importantly would not be sustainable and safe if we compromise on some of the rights, demands and practices of the actors. We have seen this in many of the studies undertaken and the experiences from almost all the LSGB’s also tell us that the complexities need to be addressed. This needs a new paradigm of SWM which extends the technical model to tackle a range of problems associated with waste management in order to achieve socially and environmentally responsible waste management. This includes a range of activities, issues and processes such as the types of waste generated, the number of stakeholders and economic activities involved, and the various economic, social and environmental effects of SWM and may include legitimization of the informal system, public participation and possibly partial privatization benefitting the local actors involved.

According to Lardiniois and Kludert (1997) essentially the Integrated Solid Waste Management means that decisions about waste handling should take into account economic, environmental, social and institutional aspects not only in the waste production stage but also in its up and downstream stages. The integration can take place at various levels: 1) the use of a range of different collection and treatment options, 2) the involvement and participation of all the stakeholders, and 3) the interactions between the waste system and other relevant systems such as industry. (as quoted from Reyer Gerlagh, Pieter van Beukering, Madhu Verma, P.P. Yadav and Preety Pandey Integrated Modelling of Solid Waste in India, CREED Working Paper No 26, March 1999). Owing to the complexity of such an approach, ISWM incorporates insights from several disciplines to develop effective management of solid waste.

Traditionally over the years, our municipalities while trying to improve the system of waste management, have concentrated only on some technical and organizational aspects such as increasing the number of labour hands, increasing the number of collection bins, privatizing collection systems, improving the transportation systems by buying more vans and tractors etc. But waste management is a much more and extended activity that involves the economic sector, comprises of a range of interlinked actors, activities, and commodities. De Souza (1991) has determined that nearly 90% of the municipal SMW budget goes in waste collection and transportation. The immediate result of such inferences has been to optimize this transport route. While such techno-fixes have served its purpose, it has not been able to solve the waste crisis, as the fundamental questions were still not being raised. Important economic goals like waste reduction, source segregation, and local recycling have not been addressed at all. Similarly, social goals such as employment generation, and environmental goals such as litter avoidance and the care for a healthy and sustainable environment have not been an integral part of the analysis. (Reyer Gerlagh, Pieter van Beukering, Madhu Verma, P.P. Yadav and Preety Pandey Integrated Modelling of Solid Waste in India, CREED Working Paper No 26, March 1999). Moreover, the waste management scenario in the State is full of externalities, the cost of which is borne by many others save
the generator of the waste or the polluter. Any ISWM system also aims at internalizing these externalities.

SOME OF THE IMPORTANT ELEMENTS OF AN ISWM SYSTEM IS

♦ Taking into account the economic, social, environmental and institutional aspects of waste in the society, and not just the technical aspects alone.

♦ Recognizing that waste management is the responsibility of municipal body but never ignoring that several socio-economic aspects exists which contributes to the problems of inefficiency and ineffectiveness of the system.

♦ Recognizing that Municipalities are unable to cope with the growing problem of increasing solid waste generation primarily due to financial constraints and organizational and technical aspects

♦ Recognizing the function of the Formal and Informal sector (Rag pickers, Secondary Buyers and Sellers etc) and building a mechanism for formalizing them and using their services efficiently and with returns for them in terms of better standards of living and economic benefits.

♦ One single model of waste management may not the best for any place. Instead, a well studied and planned approach involving all the stakeholders need to be put in place.

♦ The system should address improving the municipal services, systems of cost recovery from users and public participation, especially in segregation and collection of waste.

♦ Attention should also be given to technical aspects; upgrading of equipment used for waste collection, developing environmentally safer methods of waste management (ie, segregation, composting, recycling etc), while noting that large-scale solutions may not be feasible in areas with inadequate infrastructure.

Zero Waste

Zero Waste is a total systems approach that goes beyond just segregate-reuse-reduce-recycling. Many communities all over the world, most of them victims of some form of conventional waste disposal plants like landfills or incinerators, started thinking in the lines of going out of the very paradigm of disposal, to something that is beyond even resource recovery, which itself is considered very progressive. The three basic drivers of change that motivated such a movement was

♦ the basic concern about the hazards of waste disposal.

♦ broader and globally recognised environmental concerns such as the depletion of the ozone layer

♦ economic opportunities created by new regulations and techno-innovations that resource recovery and better materials management offered.

(Creating Wealth from Waste, Robin Murray, 1999)

Fuelled by these drivers of change, waste ceased to become a cost and economic drain on productive resources; rather it became a source of innovation. And communities learnt that revitalising the economy could very well start in the household dustbin. It was realized that whatever resources that was being used, finally became discarded. But these discards also had value, and recovering and adding value to that was an economic activity in itself.
Zero waste is a simple goal with far reaching implications. It questions the view of nature as an endless source of materials and an endless dumping ground for waste. Zero waste is not just reuse, recycling and composting even if it is done to 100%. It recognizes that the major share of the waste is actually “hidden” and the cost of such waste is seen as environmental destruction or health problems in communities living around production facilities, workers in factories and consumers who innocently use it and dispose the discards. Hence the waste happens even before a product reaches the shelf. Zero waste encompasses a “cradle to grave” approach or a “life cycle” approach for material design, production, use and disposal. So the focus of zero waste shifts from “managing waste” to “eliminating waste” and “managing resources”. Two factors recognized in this regime of materials use is that

♦ Even in a system with a very high percentage of recycling done the resource use cannot be said to be efficient. Hence waste of resources in the form of energy, would still be there.

♦ Many products today are not designed to be repaired, reused or recycled.

Zero Waste is hence a “logical planning approach incorporating principles of effective human and material resource utilization to avoid the conversion of discards into waste – an inefficient form – in a manner that revitalizes the local economy.” Inherent in the Zero Waste approaches is an emphasis on

♦ Improving a community’s self-sufficiency for resources and resource management.

♦ Systems that ensure that natural resources are not modified to forms (such as plastics) that degrade nature or poison life.

♦ Respecting and following the nature’s cyclical flow of resources - natural resources to useful products to resource reincarnation;

♦ Simplicity, Utility and Aesthetics.

The positive offshoot of such an approach is many. Most importantly, the zero waste approach ensures that our children and other life forms that share our planet are not depleted and compromised of valuable natural resources.

Zero waste is hence an approach to the flow of materials and energy in our society. It recognizes the interconnectedness of materials, products and infrastructure to ecological function and services provided by the natural environment. So the simple thumb rule for production of commodities would be “If you cannot compost it, if you cannot reuse it, if you cannot recycle it, then you better not make it”

Many countries, states and business across the world have already recognised zero waste as the way forward. The Zero waste New Zealand Trust has a majority of their local authorities already pledged to reduce Waste to Zero by 2015 as part of a joined National Pilot Project. Many places all over the world like South California Edison in Los Angels, Canberra in Australia, Del Norte County and San Luis Obispo County in California, the City of Santa Cruz are some of them pursuing zero waste visions. Many businesses have embarked on zero waste and have restructured their whole manufacturing vision and lines accordingly. Output of solid waste from Toyota plants in Japan will stop completely by 2003 end. Hewlett-Packard in Rosevilla, CA is reporting successfully diverting 97% of its solid waste. Xerox Corp., Rochester, New York has had a Waste-Free Factory environmental performance goal since the early 1990’s. The criteria include reductions in solid and hazardous waste, emissions, energy consumption and increase recycling. This program resulted in a savings of $45M in 1998.

It is also about building strong communities and local economies. Research by Washington DC based Institute for Local Self Reliance shows that only one local jobs is created for every 10,000 tons of solid waste land filled each year. Composting the same creates four jobs, recycling it creates ten and making new products from the recycled materials adds 25 local jobs. In the manufacturing sector, recycling creates more than one million US manufacturing jobs alone.
Presently our societies are “Waste hiding” societies. Our concept of waste management is to stuff away the waste into some hole on the ground. Cities want to be seen as clean, but the city dwellers do not themselves want to behave clean. The intention is thus to hide the waste. This is a trend that has trickled down from the present paradigm of development where all waste in a material production is also hidden and the material is made to look good from outside, well packed and sold in the best shelves with good captions and declarations. Zero Waste aims to do away with such kind of deceptions.

Paul Hawken in Natural Capitalism has said that “We must obey the waste equals food principle and entirely eliminate waste from our industrial production. This not only saves resources outright, but it rearrange our relationship to resources from a linear to a cyclical one, greatly enhancing our ability to lead prosperous lives while reducing environmental degradation. Instead of organizing systems that efficiently dispose or recycle our waste, we need to design system of production that have little or no waste to begin with.”
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