# Towards
# ZERO WASTE KOVALAM

## A Draft Report

November, 2001

Thanal

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# DRAFT REPORT
# TOWARDS ZERO WASTE KOVALAM

## OBJECTIVE

This DRAFT working document is meant to facilitate discussion among the various members of the Kovalam village and tourism-sector community. The discussion is aimed at gaining agreement on the way out of the garbage crisis in a manner that is economically remunerative for the community and environmentally and socially just. This report is a culmination of a nine-month exercise to understand the nature and magnitude of the garbage problem, its causes, the views of the people/businesses contributing to and suffering from the problem.

The motivation behind zeroing in on Kovalam has been the perceived decline in Kovalam's popularity as a tourism destination. Many industry people and observers say the decline is directly attributable to the pollution, aesthetic and otherwise, caused by improper disposal of garbage. Ecology, human health, and tourism are threatened due to the ubiquitous presence of trash and so is the livelihood of the local community dependent on tourism.

A Zero Waste vision is offered as a way out of the environmental and economic crisis and as an exercise that when completed will restore to Kovalam its glory as a place of beauty and tourist attraction.

Zero Waste is a logical planning approach incorporating principles of effective human and material resource utilization to avoid the conversion of discards into waste – an inefficient material form – in a manner that revitalises the local economy. This document will also function as a preliminary guidance document to initiate implementation of projects to sustain the zero waste vision.

A Caveat: Many documents addressing social issues such as garbage rely solely on data, estimates and technologies. We have endeavored to steer clear of that approach, and have sought to keep the human being (as a problem creator and problem solver) central to our analyses and recommendations. Thus, we have chosen to bias ourselves in favour of facts, collective participation, and common sense.

## BACKGROUND

### Location

Kovalam is a small fishing village on the coast of the Arabian Sea. It lies in Thiruvananthapuram district of the State of Keralam in South India. It is 12 km south of Thiruvananthapuram. A series of four crescent shaped beaches, calm and safe waters and a pleasant climate attracts people to Kovalam from all over India and the world.

### Geography

The beaches of Kovalam lie between the *Vellar Lake (*where the Karamana River joins the sea) in the north and *Vizhinjam* Harbor in the South. According to regional geographical classification, this region is generally known as Kovalam bay[1]. The *Samudra* Beach, northern most of the four beaches, about one-kilometer long is a small sandy shore. (The Samudra Beach has been named after the Hotel Samudra which is operating on the beach under the ownership of Kerala Tourism Development Corporation (KTDC) – a State Government-owned entity entrusted with the development and promotion of tourism in the state.) The local people call this region *Vellar*.

To the south lies the 400-metre long Kovalam beach. The promontory on which Hotel Samudra is located separates the *Samudra* Beach from Kovalam Beach. Further south of Kovalam beach is a 450-metre long Guest House beach. (The beach accommodates a Guest House owned by the State Government.)

India Tourism Development Corporation (ITDC)-owned Ashoka hotel is also on a promontory, separating Kovalam beach from Guest house beach. The Lighthouse Beach, more famous as the Eve's Beach lies south of the Guest House Beach. The beach is locally called *Avaduthura*, or the place where ritual offerings are made for ancestors. This beach is 550 meters long. To the south of these beaches is the lighthouse situated on another promontory which separates the Kovalam bay from Vizhinjam bay.

The Tourist Village, which covers about 2-3 sq. kms, has seen intense tourism activity for the last 30 years and is the focus of this report. The sandy beaches are surrounded on the landside by ridges and slopes made of laterite. Clay covers paddy fields and plain valleys. The Kovalam Tourist village has other landforms; flat topped ridges and small hilly formations called Upper slopes and Shoulder slopes. Further away from the beaches, ridges and slopes, lies a small flood plain valley and paddy fields.

### Water

Kovalam receives an average annual rainfall[2] of 170 cms. Groundwater is the major water source for the region. The ground water level[3] in this tourist region is less than 5 meters from the surface. A stream flows from the hill slopes behind the Lighthouse Beach, and crosses the Guest House Beach to join the sea. Though this is a small stream, it is perennial in nature. A smaller stream (streams are locally known as *thodu*) branches out of this stream and crosses the southern end of Lighthouse Beach. This *thodu* is seasonal in nature.

Two other *thodus* cross the Kovalam area; one originates from the hill slopes behind the ITDC Ashoka Hotel and crosses the beach near Ashoka Hotel's Boat Club to join the sea. The other also comes from the hill slopes of Samudra Hotel and crosses the beach just south to the promontory of Samudra Hotel. These two streams are also seasonal and form part of the natural drainage system.

There is a pond (*Kulam)* named *Vaikol Kulam* which has been protected by concrete walls behind the Lighthouse Beach. People use this pond for washing, bathing and agriculture. Earlier there were two ponds near Kovalam. One has been abandoned (*Kuthira Kulam*), and the other (*Thampuran Kulam*) was reclaimed about 10 years ago to site the present Parking Centre at Kovalam.

Drinking water in the region is mostly from the wells. In some places people use the water coming out from the local granite quarries.

**Local Commerce**

The flood plains behind the Lighthouse Beach were used to cultivate paddy and vegetable cultivation. However, agriculture here is now almost defunct. Coconut is the main crop in the region. Coconut is grown on the hills, valleys and land adjacent to the beaches. In some parts tapioca cultivation is practiced.

Fishing is the other major activity in the region. The majority of the fishing people living near Kovalam belong to the Muslim community. Mechanised boats, catamarans and other country boats are used in 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.

Tourism, a major economic activity, occupies considerable land area in this region. The ITDC Ashoka and KTDC Samudra Hotels, both Government-owned, occupy a major share of the land near the beaches. The property of ITDC Ashoka Hotel is the largest single landholding in Kovalam. On the ITDC promontory is The Palace Hotel (earlier used by the Maharajas of Travancore) and other hotel rooms and swimming pool. The ITDC Ashoka is a five-star centrally air-conditioned hotel with a conference centre capable of accommodating 800 people.

Kovalam Grove, Ashoka Hotel's independent cottages, lies across the road from the Convention centre. The properties of Ashoka Hotel and KTDC have been minimally and selectively developed along the Kovalam and Guest House beaches. Barring a restaurant on the Guest House Beach, two parking centres on the land owned by ITDC and two comfort stations, the Kovalam and Guest House Beaches have no commercial establishments. The Lighthouse beach, on the other hand, is built up with numerous commercial establishments ranging from communication booths to 3-star hotels.

**Demographics**

The 1991 Census figures reveal that there are 1,279 males and 1,239 females (Total: 2,518) in the Panchayath ward of Kovalam. A Ward is the smallest democratic administration unit in the Panchayath administration system. There are 530 families in this ward, living in 499 houses. These numbers account for the resident population. People not included in this count are the tourists, business persons from outside areas, temporary peak-season workers and employees of the commercial establishments.

It is estimated that during 1997, there were 45,407 domestic tourists and 38,384 foreign tourists (Total: 84,791). There is no reliable data available on the number of people employed to cater to these tourists. It is estimated that the employees working in the various commercial establishments (mostly in hotels and restaurants) are about 1800.

The majority of the local people (37.05%) from Kovalam are casual labourers who are engaged in the construction and granite quarrying. Tourism is the next major economic activity in which 23.9% of local people are involved directly or indirectly. Fishing comes third with 12.7% and about 1.6% people are engaged in agriculture.

## ADMINISTRATIVE AGENCIES

The Kovalam region is under the control of various administrative agencies.

### Panchayath

Panchayath is the democratic unit administered by elected representatives of people. The Panchayaths form the third rung of the three-tier Panchayath administration system. District Panchayaths are the first tier and Block Panchayaths are at the middle level. All the three Panchayaths are under a "democratically" elected State Government.

Kovalam falls in the *Vizhinjam* Grama Panchayath of *Athiyannur* Block in Thiruvananthapuram District. Kovalam is a ward in Vizhinjam Grama Panchayath. The President, who has been elected from the ward representatives, heads the Panchayath. A Secretary to the Panchayath, a government employee, looks after the secretarial work. The total area of the Vizhinjam Panchayath is about 12.62 sq. km. It has 15 wards. Kovalam is the Ward No. 1. Being the local Government, the Panchayath is empowered to implement laws, which have been laid down by State and Central legislatures.

### Village

Village is the smallest unit under the Department of Revenue that is operated by Government officials. In the hierarchy of Revenue divisions, Taluk comes above the village and below the District. The District Collector is the supreme officer at the District level. Kovalam comes under the Revenue jurisdiction of Vizhinjam Village of *Neyyattinkara* Taluk in Thiruvananthapuram district. The collection of land taxes and maintenance of land records are the responsibilities of revenue village office headed by Village Officer.

### Port Department

The Port Department is the wing of the State Government to control and operate ports in the State. For technical and security reasons the control over the land adjacent to the port is within the Port department. Hence, the Vizhinjam Port Office possesses control over the beaches of Kovalam. Out of special consideration for the Tourism industry, the Port Department allows economic activities like lending of beach umbrellas, operation of tourist rafts and boats. Operators are required to obtain a license from the Port Office at Vizhinjam. An annual license fee is levied for each activity.

### Police

Police is the executive enforcement machinery of the State Government. The State Police is represented locally by a local Police Station. They are responsible for the maintenance of law and order in the region. The Police Station is headed by a Sub Inspector of Police with his Head constables and constables. The functions of the local police stations are coordinated by Circle Office which is headed by Circle Inspector of Police placed above the Sub Inspector. The Kovalam Police Station, which comes under Vizhinjam Circle, is the authority responsible for the maintenance of law and order in the region.

In Kovalam, there is also a special category of Police known as Tourism Police to help the tourist by giving protection, guidance and information. Kovalam was the one of the first tourism destinations in Kerala to have Tourism Police.

## IMPACTS OF TOURISM

### Historical Perspective

The late Maharaja of Travancore Sree Chithira Thirunal Balarama Varma first brought Kovalam to the public eye as his summer retreat. It was he who built the Halcyon castle, which was later converted into a deluxe hotel[4].

Kovalam was first selected for being developed as a seaside resort by the 'Club Mediterranean'. The Department of Tourism and Govt. of India endowed the selection because of the beauty of the location and safe bathing waters. In 1966, the Department of Tourism took over the beach area within an old beach house. Later, the coast excluding the present Guest House Complex of Dept of Tourism was handed over to ITDC and they built a five star hotel – Ashok Beach Resort — in 1970's.

In 1972, Dr. Karan Singh (Union Minister For Civil Aviation and Tourism) inaugurated 'Kovalam Grove' a beach resort of ITDC at Kovalam. Later, ITDC further expanded its hotel resort by adding an additional 72 rooms. Simultaneously, private entrepreneurs entered Kovalam Tourist Village resulting in several other land developments. These constructions were concentrated in Vellar lake and Vizhinjam Lighthouse areas.

In 1975 Kovalam-Vizhinjam development authority was set up for the development of the Kovalam-Vizhinjam region. There were schemes for the improvement of infrastructure for tourism and general public. KTDC started Hotel Samudra in 1981.

In 1986, the Government of India declared tourism as an Industry. In 1988, the foundation stone for 'Rajiv Gandhi Conference Centre' (ITDC owned) was laid by the then Union Co-minister for Civil Aviation and Tourism, Mr. Sivaraj V. Patil. In 1995, it was inaugurated by Patil's successor Mr. Ghulam Nabi Azad.

Parallel to the government development activities, small businesses started to spring upon Eve's beach in the early 70s, catering to the needs of the low-budget travelers. Development at Eve's beach picked up after a slow initial phase. The early tourists who had to sleep on the beach were now being offered accommodation in small lodges. Kovalam became famous in India and abroad. Tourist visitations to the region skyrocketed. Kovalam turned out to be one of the major tourist attractions in India. Majority of the tourists came from U.K, followed by Germany, France, USA, Italy and Japan[5].

In 1995, chartered tourism was introduced to Kovalam, causing excitement in the local industry. The first groups of chartered tourists were given a warm welcome at the Airport by the Department of Tourism. According to local sources, the arrival of chartered tourists created an anticipation of increased demand for hotels and restaurants, resulting in a sudden increase in the number of commercial establishments.

The facilities at Kovalam beach have been upgraded to improve the image of the beach resort. Development of roads and pathways, lighting, augmentation of water supplies, and construction of a tourist information centre with modern facilities have been undertaken by the Department of Tourism. They additionally provide beach cleaning and lifeguard services. The development of a sewage disposal system is being planned to fulfill long-standing demand for infrastructure[6].

**Visitation Trends**

The following figures include back packers, students on excursions, pilgrims and chartered tourists. From 1986 to 1993, the tourist inflow to Kovalam increased from 78,672 (foreign-44,626 domestic-34,046) in 1986 to 142,637 (Foreign-44,850 Domestic –97,787) in 1993. The increase was largely due to an increase in domestic tourists. These figures fell to 54,228 in 1994 (foreign-28,184 domestic-26,044). The year 1994 witnessed considerable fall in the foreign tourists compared to other years.

1995 onwards the tourist influx is again on the up ward rise. The figures from 1986 to 1997 shows that the number of foreign tourists visiting Kovalam varies between 30,000 to 50,000 annually. Domestic tourist pattern varies significantly. November to February is the peak time (about 5,000 tourists per month). July is the least visited month (1,647). (This is based on the 2000 statistics where it recorded 44,440 foreign tourists)[7]

**Land Use Patterns**

In the Kovalam ward, a majority of the land was earmarked for agriculture – coconut was the major crop. An estimated 17,770 coconut trees[8] stand in this ward alone. A small portion of land behind the Lighthouse Beach was suitable for paddy cultivation. Currently, however, there is no paddy cultivation here. All the fields in this area are polluted with plastic waste and garbage.

Tourism activities occupy a big share of land use in Kovalam ward. The property of ITDC and KTDC are the biggest single units of land marked for tourism activity. ITDC owned Ashoka Hotel reserves right for their customers to access the beach adjacent to their boat club.

The land available near Lighthouse Beach has been developed massively with shops and establishments to support the tourism industry. There is a volley ball court on the Lighthouse Beach which is a tourist attraction. The new pavement for tourists along the Lighthouse Beach, occupies a considerable portion, constructed by Department of Tourism.

The growth of tourism industry in Kovalam has changed the land use pattern. The economic potential of tourism caused people to make use of most of the available land to construct rooms for commercial establishments. The agriculture sector suffered for want of land and labour, the latter opting for employment in the more remunerative tourism industry. People retain low-maintenance crops like coconut.

The practice of dumping waste on any open space and the possibility of economic benefits has compelled people to lease their unused land for commercial purposes. Absence of waste disposal system leads to burying of waste on the shore. During the monsoon when the sea invades the land, the buried waste is exposed. The perennial stream flowing from behind the Lighthouse Beach has almost become a sewer channel, carrying the effluents from the hotels and restaurants in the region. The polluted water in this once freshwater stream is an environmental nuisance.

The hotels, restaurants and other kind of shops dispose their wastewater from toilets and bathrooms to septic tanks. The Lighthouse Beach region, where the ground water table is at a mere 5 meters, has a high concentration of septic tanks. Since the major source of water is wells, the septic tanks pose a serious threat to the quality of the ground water. This adds to the pressure of scarce drinking water.

A majority of the commercial establishments is concentrated along the Lighthouse Beach, the beach is frequented by tourists at all times of the year barring the monsoons. The Guest House Beach is alive with the fishing activities of local fisherfolk who also use the Kovalam beach. Fishing activities, fish landings and the songs sung by the fisherfolk add to the charm of Kovalam and keep many a tourist entertained. Sometimes, visiting tourists lend a hand to the local fisherfolk when the shore seines are pulled. As a traditional practice, each person who joins the shore seine team is given at least one fish as reward when the fish is plentiful.

The Kovalam Mazjid, which is on the Kovalam Beach, attracts visitors and followers. Some of fisherfolk offer tourists a sea ride in their *kattumarams* (literally, logs tied together or catamaran}.

**Discard Issues**

An increasing number of tourists and commercial establishments to cater to them resulted in a growing mountain of garbage in Kovalam. The discard management practices did not incorporate the peculiarities of the habitat and the needs of the community. Neither did they harness innovative technical solutions nor create committed administrative machinery to address the problem of discards. As a result, garbage such as plastics, biodegradables, metal scraps and consumer items found their way into the local environment. This posed, and continues to pose, an aesthetic, public health and ecological problem.

As early as 1990, some visiting foreign tourists had embarrassingly taken the initiative to collect the garbage on the beach, if nothing else to make their short stay in Kovalam more pleasant.

With a few exceptions, most tourists, in their own way, also contributed to the garbage crisis. The scarcity of clean fresh water and the hygiene concerns of visiting tourists caused a boom in the sale of bottled water. The result — an unmanageable problem in dealing with plastic bottles litter. Disposable plastic items contributed significantly to the increased complexity and ubiquity of the garbage.

The magnitude of the garbage problem in Kovalam is perhaps better understood through photographs and the plummeting figures of tourist visitations rather than it is through inaccessible data about the types and quantities of wastes generated. Although, Kovalam does suffer from certain peculiarities given its status as a global tourist destination, the situation in this beautiful beach village is no different from that facing the numerous Indian cities and towns choking on their own garbage and collective human excreta.

**DISCARD CHARACTERIZATION STUDY:**
**KOVALAM TOURIST VILLAGE, KERALA, INDIA**

## INTRODUCTION

The main focus of this study is to establish baseline information on the type and quantity of the discard stream produced by commercial activities in the Kovalam Tourist Village. The study also identifies the main sources of liquid, solid and gaseous wastes and its disposal practices.

The study included site visits and surveys done during the off-season between June and October 2001. The intention was to cover all the possible establishments that were kept open all year round with input from locals who live permanently in Kovalam. A detailed structured questionnaire was utilized during extensive face to face interviews with commercial establishments.

562 commercial establishments were identified in the Kovalam Tourist Village. Classifying each of these establishments was a challenging task. Many shops conducting similar businesses were categorized differently. For example, tailoring shops sold mineral water bottles and even fruit juices. Hence, the team decided to classify according to the primary business undertaking of the establishment. A break up of establishments and those that were surveyed is shown in the table below.

**TABLE: ESTABLISHMENTS SURVEYED BY CATEGORY**

| Category | Establishments | | % Surveyed |
|---|---|---|---|
| | Total | Surveyed | |
| Hotels | 51 | 28 | 55% |
| Restaurants | 66 | 33 | 50% |
| Lodges | 73 | 28 | 38% |
| Petty Shops | 25 | 15 | 60% |
| Bakery/Cool-bars | 10 | 5 | 50% |
| Provision/Fruit/Veg. Shops | 23 | 6 | 26% |
| Textile & Tailoring | 44 | 17 | 39% |
| Curio Shops | 109 | 9 | 8% |
| Beauty Parlors | 3 | 1 | 33% |
| Massage Salons | 32 | 2 | 6% |
| Communications | 32 | 6 | 19% |
| Travel / Services | 31 | 7 | 23% |
| Beverages | 1 | 1 | 100% |
| General Stores | 62 | 13 | 21% |
| **Total** | **562** | **171** | **30%** |

In the month of July 2001 the team started surveying the establishments with the help of the questionnaire. Along with the characterization of discards, the questionnaire was also meant to collect information on the attitudes, observations and ideas of local people on issues and its solutions. Parallel to these efforts the team also prepared maps to identify and illustrate dumps in the region. The survey process was completed in the month of October 2001.

## METHODOLOGY

An attempt was made to collect peak-season figures of discard generation from the establishment owners. This data is limited owing to its dependence on the respondent's memory, interpretation and willingness to share accurate information. To arrive at estimates for the whole region, the team made projections based on information collected on the patterns of discards produced and nature of the establishments.

Following methods were used in analyzing data for this study:

Visual survey: To identify the extent of commercial activity in Kovalam, distribution of the establishments, locations of dumps and burning sites and the behavior of visiting tourists.

Interviews: The team interacted with a number of people doing business locally, the Panchayat (people's representatives), local leaders, union and association leaders, government officials, Tourism Department, women's groups and neighborhood groups. Tourists will be interviewed during the peak season in early 2002.

Questionnaire survey: To find the composition of discards, waste disposal practices and attitudes of the establishments towards the waste issues, disposal methods and solutions.

This study is sprinkled with charts illustrating estimates of discard generated by various commercial activities. Detailed tabular data is not included in this report and will be furnished upon request.

## ON SITE SURVEY PROCESS

Out of the 562 commercial establishments in the study area about 250 shops were operational. The team was able to survey 171 (30% of the total) businesses. Some establishments, especially the curio shops were unable to participate in the survey. They wanted the team to get permission from the President of their trader's association.

The survey did not cover Hotel Ashoka, since they are a single major hotel and landholder. Their magnitude necessitates that the discard handling program be addressed separately. Certain entities doing business, like the street vendors, who operate only during the peak-season were not included in this survey. Also, not included were homestay-accommodation related activities, and households within the village. All these entities and their discard-related habits would be included in the second phase of the assessment/study.

## SURVEY FINDINGS

### Bio-degradables

#### Total Estimates

Out of the 562 establishments identified in the tourism area, our analysis estimates that 241 establishments including all hotels, restaurants, petty shops, bakeries, provision stores, general stores and coconut vendors are the generators of bio-degradables. It is estimated that they produce a total of about 6,690 kgs of bio-degradables everyday.

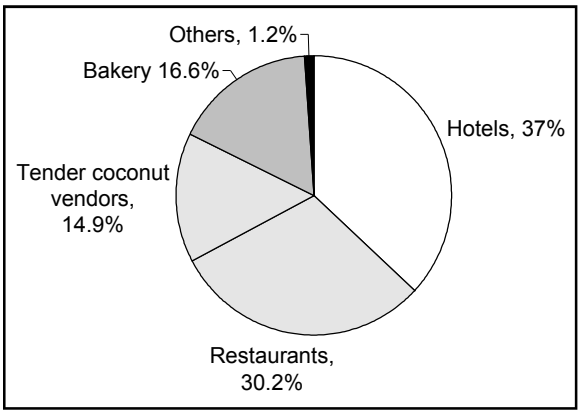
This is a conservative estimate, as it was not possible to include many of the street vendors that do business during the peak season. During peak season, a number of petty shops, provision stores, general stores, hawkers, and bakeries also sell coconuts, fruits and juices. The quantity of biodegradables generated by this sector can only be

assessed in a separate peak season study. The purpose of the current estimated baseline value is to show the intensity and patterns of biodegradable generation.

Of these estimated bio-degradables, 37% and 30.2% are kitchen/food scraps from hotels and restaurants respectively. The bakeries contribute about 16.6% of coconut husk and shell discards. Four tender coconut vendors, not counted as establishments in the survey, contribute about 14.9% of total in coconut husks and shells.

Fifteen (15) of the 25 petty shops, 13 of the 62 general stores generate a small amount of about 1.2 % of the bio-degradables. This comprised mostly of fruit peels, which were either burned or dumped in the neighborhood itself.

**Biodegradable Discards - Establishment wise**



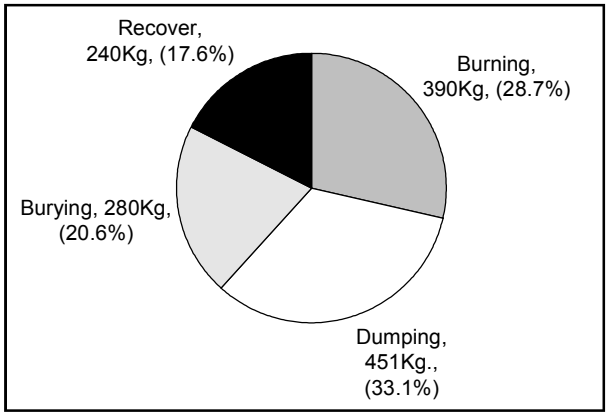

**Bio-degradables from Hotels and Restaurants**

Of the 51 hotels in Kovalam, 28 that were surveyed produced about 1,360 kgs of bio-degradables each day. Most of these bio-degradables are mixed along with other discards and either burnt (28.7%), dumped (33.1%) or buried ( 20.6%). Two hotels that have installed bio-gas plants are diverting about 17.6% (240 kg) of the biodegradables and the bio gas recovered is used on-site in their kitchens.

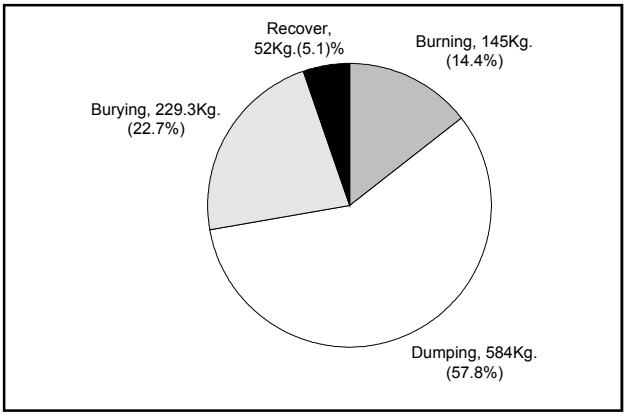
Of the 66 restaurants, 33 that were surveyed generated a total of about 1,110 kgs of bio-degradable. Of this estimate, 14.4% is openly burnt, 57.8% is dumped and 22.7% is buried. About 52 kgs (5.1%) is recovered for use as cattle feed or directly applied to land as green manure.

**Biodegradable Discards - Current methods followed for disposal**

**Hotels**




**Restaurants**



*Tender Coconut Discards from Vendors and Bakeries*

At the time of this survey, which was off-season, four individuals were selling tender coconuts. It is understood that during the peak season, the number of such street vendors increases up to hundreds in numbers. These are mobile ad transitory establishments. One of the tender coconut vendors surveyed produces about 250 kgs of coconut husks and shells. This was being diverted upon drying as kitchen fuel.

Of the 5 bakeries that were surveyed only 2 of them produced a total of 555 kgs of coconut husks and shells. Due to lack of options, the bakeries were dumping most of these discards on the beach and the neighborhood.

**Mineral/Water Bottles**

Plastic bottles for mineral water or water have come into the market very recently and being a disposable item soon found its way into the dumping sites and has made the most visual nuisance at Kovalam Tourist Village. Many survey respondents have identified PET bottles (known as such after its most commonly available plastic resin) as the number one blight that needs to be addressed immediately. Mountains of mineral water bottles, crushed, half burnt or simply hidden (underneath dumped leaves and food material) have done considerable damage to this destination's tourist potential.

The mineral water or water supplied in these bottles is an important drinking water source for the tourists – both foreign and domestic. The plastic bottles have very little resale or reuse value and it can be reused only if undamaged. Beverages, in thicker plastic containers, are also consumed to a great extent, but it was found that they do not get dumped, as there is reuse market for these thicker plastic bottles. However, the manufacturers such as Pepsi and Coke play no role in fulfilling their responsibility of seeing their products through from cradle to grave. Presently the survey did not make an assessment of these beverage bottles.

**Mineral Water Bottles Estimates**

Of the 562 establishments 354 sell bottled water. Most of the hotels, restaurants, petty shops, bakeries, textiles/tailoring shops, general stores, lodges and provision stores cater to the tourists demand for bottled water.

It is estimated that on an average 4,340 mineral water bottles get sold every day in the peak season. This is again a very conservative figure and only reflects those bottles that get sold from the establishments in Kovalam. The estimate has not considered the hundreds of street vendors who may be selling these bottles. The figure also suffers from the limitations of depending on shopkeeper's memory recall and willingness to divulge accurate information.

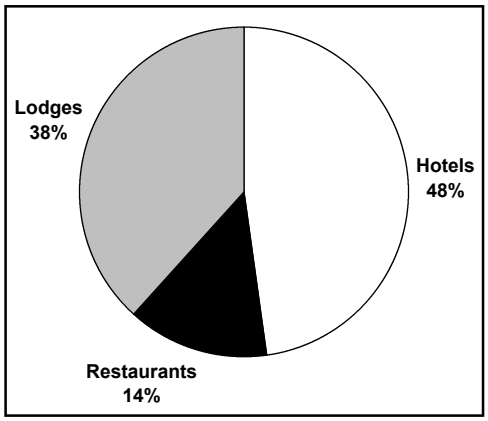
Moreover, the team interacted with a prominent bottled water supplier and was told that their brand alone sells 12,000 bottles every week during peak season. There are at least 7 other mineral water brands sold in Kovalam.

Of the projected estimates, 35.6% sales is from hotels, 14.2% from restaurants, 15.4% from petty shops, 14.9% from general stores, 10.5% from provision stores, and 5.9% from lodges. Bakeries and even textile and tailoring shops sell 3.5% to tourists.

While 354 establishments sell mineral water bottles only about 251 establishments generate the used plastic bottles as discards. The survey has estimated a total of 6,090 discarded mineral water bottles from four sources i.e. hotels, lodges, restaurants and

some petty shops. 47.7% of these plastic bottle are from hotels, while lodges contribute 38.3%. Restaurants dispose 14% and 0.1% is found in the bins of petty shops as well.

**Mineral Water Bottles Discards - Establishment wise**




It has also been found that a large number of PET bottles is directly dumped by the domestic tourists. This study has assessed this quantity. Neither are the figures for the home stay included.

The 28 hotels surveyed dispose about 1,590 units of bottled water everyday. The hotel and lodge owners report that a tourist who stays at Kovalam uses and discards about 3 mineral water bottles every day. Most of this gets discarded in the dustbins in the rooms or gets thrown out in the beach, open drains and/or streams. The hotels mostly dump the bottles approximately 56.2% while 14.8% is burned and 6.4% is buried. The survey revealed that 22.6% of the plastic bottles is recovered in good shape and sold to an agent who takes it to Thiruvananthapuram City and reuses it as water bottles or oil bottles.

The 28 lodges that were surveyed disposed a total of 890 bottles. Even though lodges sell a relatively lesser number of bottled water, they get a lot of discarded bottles from the rooms. In the evening all this is collected and disposed off.

It is estimated that about 54.2% is dumped in the neighboring open land, drains and/or streams, 28.2% is openly burnt, 12% is buried and 16.2% is sold to the reuse agents who come to collect them. These agents pay 50 paise for a bottle.

The third source of mineral water bottles is restaurants. 33 surveyed restaurants disposed about 420 bottles every day, 16.9% of which gets dumped, 19.7% burned and the rest 63.4% sold in the secondary reuse market.

Petty shops also have a few discarded bottles that are mostly burnt in the open.

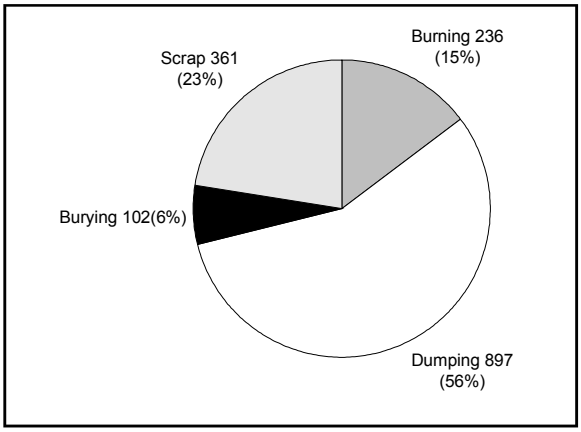
**Other Plastic Bottle Disposal Practices**

Some of the disposal practices were rather shocking. Mineral water bottles were sometimes crushed, compressed, put into a gunny bag, tied and burnt with kerosene. The pond near the “Lonely Planet” restaurant was full of these bottles along with other discards.

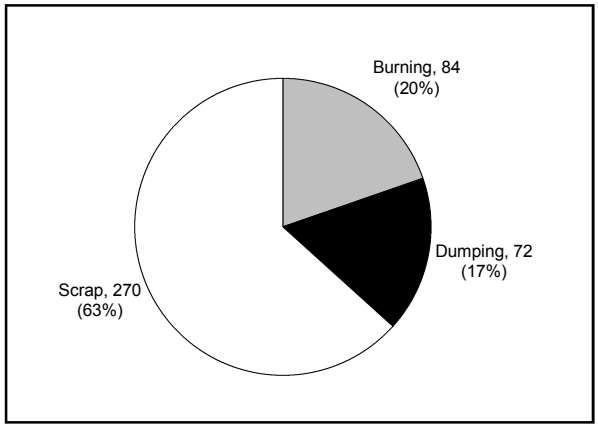
Many opined that banning plastic bottles was the only solution, while others said that we must have some technology to dispose PET bottles, without causing harm to the environment.

**Mineral Water Bottle Discards - Current methods of Disposal**

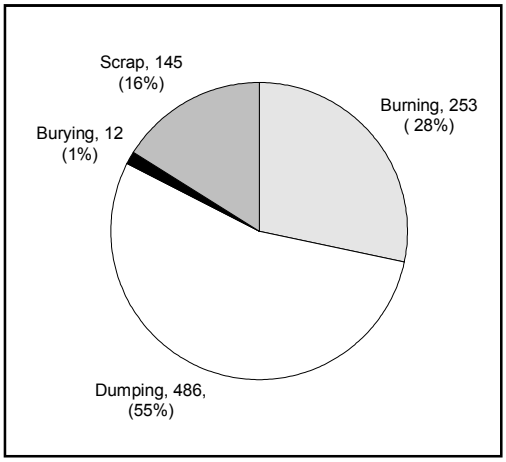
**Hotels**




**Restaurants**




**Lodges**




*Plastic Carry Bags and Plastic Packing Covers*

Plastic carry bags have come identify the growing consumer middle class – an image of a family walking into the grocery or shopping complex empty handed and walking out with a couple or more of these thin colourful plastic carry bags. There ubiquity and easy availability deter even the most frugal of Indians from saving them for reuse.

**Carry Bag Sales**

At least 304 establishments in Kovalam use plastic carry bags. It is estimated that these establishments sell 2,390 carry bags every day. Of this total, curio shops sell nearly 55.6%, petty shops 13.9%, general stores 11% and provision stores 11.2%. Textiles and tailoring shops give away 5.6% while bakeries and travel services contribute about 2.6%. The survey estimated about 40 carry bags being given away by a typical street vendor, who are not counted as establishments in this study. It was difficult to know how many such street vendors sell carry bags in the peak season. Hence this estimate gives only an approximate baseline information of the carry bag sales in Kovalam.

**Plastic Packing Cover Sales**

Plastic packing covers are mostly the food grade transparent packing covers and other covers on which common consumer goods and bakery items are packed.

Provision stores, general stores, petty shops and curios are the main vendors of various items in plastic packed covers. Restaurants, bakeries, textile and tailoring shops also contribute to the packing cover sales. It is estimated that 339 of the establishments sell about 1360 such packing covers every day with the food and other consumer materials. Provision stores sell 40.3%, general stores sell 26.7%, petty shops 20.2%, curios 8.9% and the rest sell 4% of the packing covers.

This assessment is also a very conservative value and needs to be reviewed in the peak season time.

*Carry Bag/ Plastic Packing Estimates*

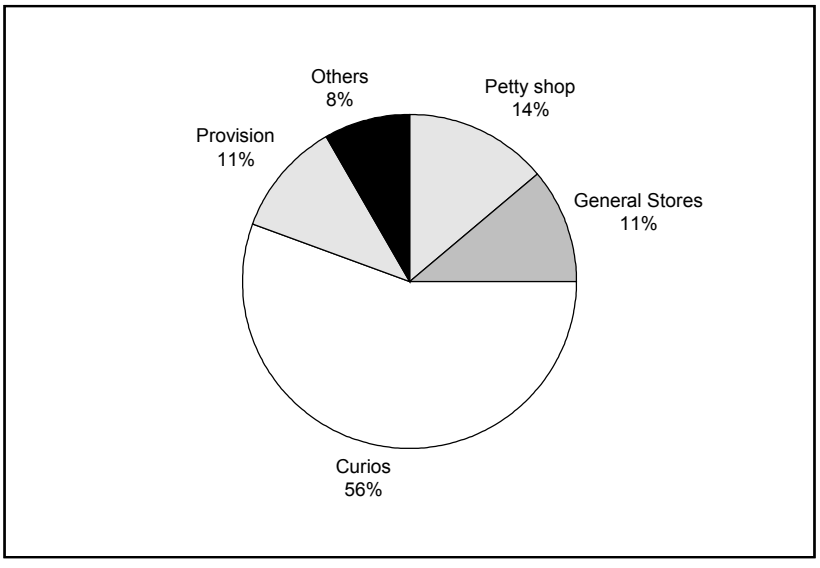
Carry bags and thin plastic packing covers were not differentiated in the waste bins by most of the surveyed people and discarded carry bag and plastic packing covers were consolidated. The estimate is that the 314 establishments which consists of hotels, restaurants, bakeries, general stores, travels and services, lodges and provision stores together dispose a total of 1,460 units of carry bags and packing covers.

Even this highly conservative figure of 1,460 per day is alarming. Provision stores contribute to 29.8%, bakeries 24.5%, restaurants contribute to 21.5%, lodges 8%, travel services 7.6% and general stores 5.5%.

From the 6 Provision stores surveyed it was assessed that about 110 carry bags/plastic covers were being discarded. This is mostly burned (51.8%) or dumped (48.2%) openly. Five bakeries which were surveyed reported that 180 of these discarded bags/covers are mostly dumped(76.5%) or burned (23.5%).

33 restaurants reported that 150 bags/covers were dumped (77.1%), burned (16.6%) and the remaining buried (6.4%). 28 lodges that were surveyed contributed about 45 carry bags/ plastic covers most of which was being dumped. Travel services 7 of which were surveyed had 25 such discarded bags/covers that were burned. The 13 general stores surveyed reported 17 bags/ covers that were similarly being burned. The surveyed 28 hotels reportedly generated a total of 25 such discards.

**Use of Carry bags - Establishment wise**



The relatively low presence of carry bags/packing covers in the garbage is because carry bags and packing covers are usually taken along with some items and many a domestic tourist carries it home. A good number of carry bags were taken back to the homes especially during the fishing season when the local people purchase plastic bags to carry fish to their homes. Hence, it does not get dumped in the beach area.

*Milk Covers*

Milk happened to be one of the first consumer perishable items, which got packed, in plastic covers. About 25 years ago milk used to be supplied by the Kerala State Milk Marketing Federation (MILMA) in stoutly shaped glass bottles with a wide mouth covered with an aluminum foil. The glass bottles were taken back daily.

Now, milk is supplied in plastic covers made of HDPE (a type of plastic resin) and can be recycled. The secondary market buys them from the generators. In spite of this infrastructure, milk covers reach the Kovalam's waste stream in thousands due to the lack of an environmental awareness among vendors, and because of the absence of a mechanism to collect the covers from various milk users.

Agents of the various milk companies sell milk directly to the hotels in Kovalam. The hotels and restaurants also buy milk in covers from the local vendors. MILMA, a cooperative under the Government of Kerala enjoys a major share of these sales. The survey only wanted to learn how many milk covers are discarded and how are they being disposed. It was found that the total sale of milk in plastic covers was estimated to be 1760 units per day from 62 general stores.

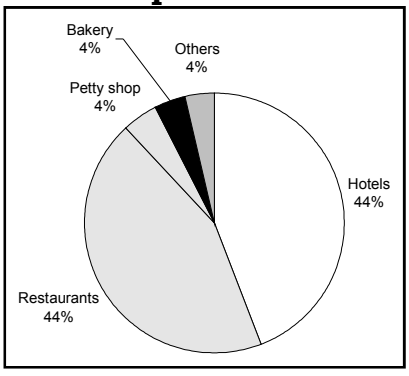
*Milk Cover Discards*

248 establishments in Kovalam, which include hotels, restaurants, petty shops, bakeries, lodges and provision stores use milk in cover. It has been estimated that these establishments together dispose about 2,760 milk covers every day. Of this 44.1% is by the hotels, 44% by restaurants, 4.4% by petty shops, 4% by bakeries, and the rest by lodges and provision stores.

Of the 51 hotels, 28 were surveyed and it was estimated that these hotels dispose 660 milk covers. 50.1% of these covers are burned, 33.4% buried and 16.5% is sold in the secondary market through agents. Of the 66 restaurants, 33 were surveyed and it was estimated that they dispose about 600 milk covers. While 59.6% of these are dumped, 2.5% is burned and 34.6% reaches the secondary market for recycling.

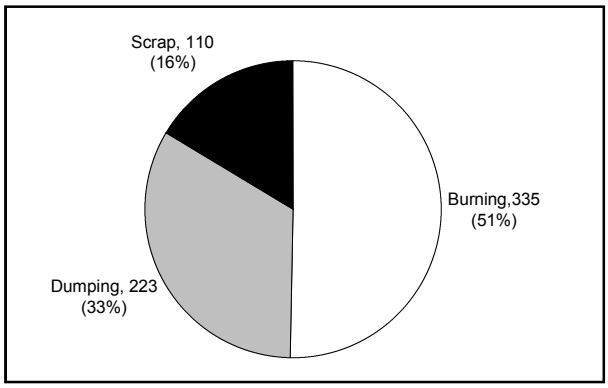
Many hotels said that they do recycle milk covers. But when agents do not come to pick up on a timed schedule the segregated milk covers get either dumped or burned. Many of the hotels have eliminated purchasing milk in covers since there is an established local supply in bulk dispensing cans.

**Milk cover scrap - Establishment wise**

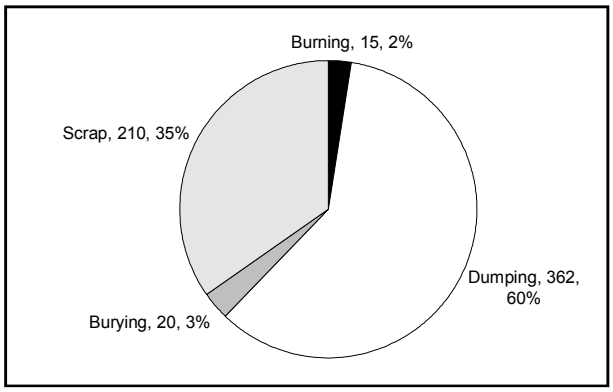


**Milk Cover Scrap - Disposal methods**

**Hotels**




**Restaurants**



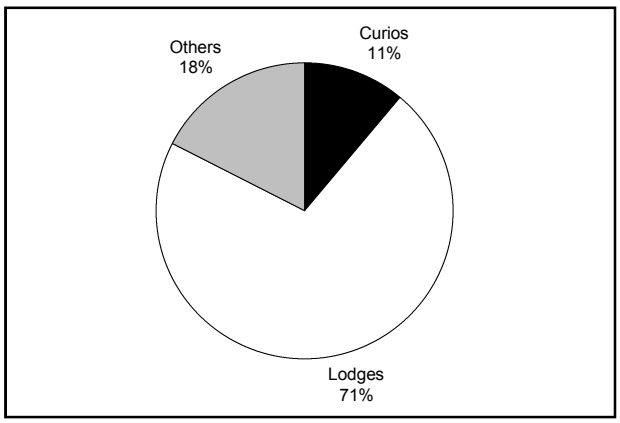

*Paper*

Discarded packaging paper, napkins, used newspaper, other paper fibers used in computer stationary and telephone bills to small bits of paper that is used to sell groundnuts can be seen strewn around in Kovalam. About 416 establishments – all the hotels, petty shops, bakeries, communication centers, travel services centers, curio shops, general stores, lodges and provision stores — have an estimated total of about 130 kgs of paper discards daily. Newspapers supplied to these establishments are either used for packing or get sold in the newsprint recycling market or for packaging cover manufacturing.

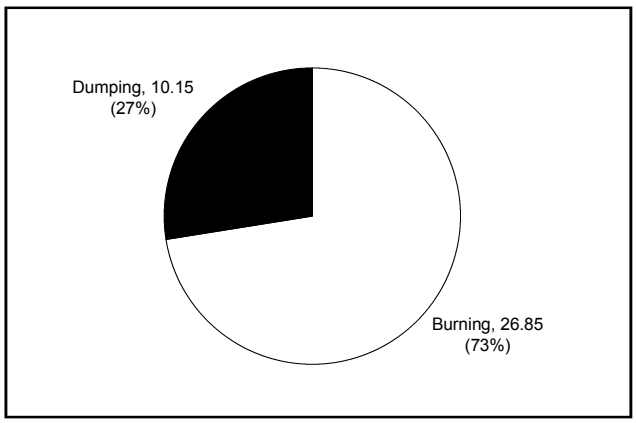
Of this estimated total, the lodges produce 71.4%, curios 11,1%, general stores 5.2% and the rest of the establishments together produce 12.3% of the paper discards. Other establishments also produce some paper scraps, although not a substantial quantity from any single source, these are usually burnt or dumped, and sometimes even buried with in the vicinity.

The 28 lodges that were surveyed produce about 37 kgs of paper discards which is mostly burned (72.6%) and the rest is dumped (27.4%). Lodges produce a large amount of discarded pieces of paper since they do not have an attached catering facility hence the tourists bring food packet from the outside. The packaging is then discarded in the rooms, which then end up in the neighborhood dumps and/or are burnt.

**Paper Discards - Establishment wise**




**Lodges -Disposal methods of Paper Discards**



*Disposable Plastic Cups*

About 25 petty shops and 10 bakeries in Kovalam use and dispose an estimated 720 plastic cups every day. Quantity of cups typically sold to hotels could not be estimated. Of this 87.5% comes from the petty shops and 12.5% from the bakeries. Most of these cups come as packaging for ice creams (ice cream – cups) and for tea and coffee sales. After use, these cups are discarded in the shops, which burnt at the end of the workday, in the evening. The tourists also take these cups to the beach or to the hotels. These are usually burned or dumped locally.

A street vendor who sold tea and coffee in plastic cups was surveyed. He said he sells 75 cups daily in peak season. An accurate estimate of number of such vendors on the street during peak season was not available. Thus, the value projected here can be considered only as a rough baseline quantity.

*Other Miscellaneous Discards*

Kovalam generates a number of other types of discards that are managed quite differently from the major ones mentioned above. Here is a list of the following that is not exhaustive:

**Used Cardboard boxes**

The only beer parlor owned by the Beverages Corporation receives beverages in cardboard boxes. Every day about 80 such boxes are sold to the recycle/reuse market.

**Cotton**

Kovalam has 32 massage salons and two that were in the survey indicated that about 110grams (0.11 kg) of used cotton and sponges are dumped. A projection would show that about 1.7 kgs of such scrap could be reaching the dumping sites daily. Beauty parlors also produce some cotton scrap, values of which could not be estimated.

**Cloth**

It has been estimated in the survey that about 20 kgs of cut cloth is produced by 44 textiles and tailoring shops. The 17 shops that were surveyed revealed a total discard of 9 kg of cloth - 61.9% of which is burnt and 38.1% is dumped in the neighborhood.

**Cut Hair**

Three beauty parlors function in Kovalam and together they produce about 3 kgs of cut hair that is buried in the vicinity. The beauty parlor owners mentioned that previously hair used to be diverted for making wigs and/or land applied in yam cultivation. But, today it is being fully dumped on the beach.

Kovalam also has a number of other consumer items, which is left behind by the tourists in their hotel rooms. These items such as batteries, tube lights, bulbs, glass scrap, mirrors, oil and oil tins, spray cans, paste, shampoo, detergent packs etc. are disposed by burning or dumping which releases toxics into the ambient media. Broken utensils, chairs, PVC curtains and table cloths are changed every season by the hotels. Some are sold and the rest are dumped or burned. All these material discards could not be assessed and needs to be addressed in detail in a future assessment.

**Water Consumption of establishments in Kovalam**

The survey has estimated that among the 562 establishments, a total of 970 kiloliters of water is consumed every day. The consumption pattern shows that hotels are the heaviest consumers of water, taking in about 600 kiloliters (61.20%). Lodges consume about 280 kiloliters (28.9%) and restaurants about 80 kiloliters (8.61%). Rest of the establishments together consume about 1.3% of the total water utilized. Wells are the main source of water followed by pipelines and borewells. Tanker lorries also supply some water especially to hotels and lodges. This study could not estimate allocated contribution from these various sources.

Electric utilization and wastewater or sewer discharges will be estimated in a future study.

## GARBAGE MANAGEMENT EXPERIENCES — KOVALAM, INDIA AND ABROAD

Marking the beginning of the new millenium, the Government of India announced the Municipal Solid Waste (Management & Handling) Rules 2000. By legislating to manage and handle its municipal solid waste, India may have acknowledged the problems associated with its status as a growing consumerist economy. The unmanageable mountains of garbage characterizing Western cultures now plague our society too. But the rule do not seem to have integrated any lessons from the history of cultures that took the consumerist route and grappled helplessly with the disposable discards of their lifestyles.

Evidence from around the world points to the mass failure of the dump-bury-burn methods of "waste management." Despite that, India's MSW Rules recommends landfills, incinerators and centralised composting plants with a token mention of recycling and reusing, and segregation. Waste prevention an integral part of the 3Rs mantra of 20th century waste management does not merit even a cursory mention. Neither has there been an attempt to learn from the rural and agrarian economies within India that continue to practice traditional zero waste approaches to managing the natural resources they depend upon.

Inherent in their zero waste approaches 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 plastics) that degrade nature or poison life.
c) Respecting and following the nature's cyclical flow of resources – natural resource to useful product to resource reincarnation;
d) Simplicity, utility and aesthetics.

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

Western engineers have attempted to address the discards of modern society, but have failed to come anywhere close to even understanding the problem, leave alone recommend solutions. As a result, the West has foisted upon itself and the rest of the world a behemoth waste management industry that will die in the absence of waste – an industry dependent on waste … an industry that specializes in inefficiency.

To understand zero waste, it is necessary to understand the distinctions between garbage, waste and resources, and the conventional interventions to address "waste" and their limitations. To understand zero waste, one has to step outside the box, regain creativity and common sense.

**Resource, Garbage and Waste**

*Resources* are the raw materials used for sustaining life, and – in the case of humanity — improving the quality of life**.** Inherent in the word is the prefix "re" which hints that the material is destined to be returned to source so that it can be made available to future generations.

*Re-sourcing; Re-cycling; Re-pairing; Re-using:* Some items in the garbage (biodegradables) can be re-sourced. The utility or life of other items can be extended, either in the same form (Reuse or after Repair) or in a different form (Recycled). Others, such as toxic substances, may have to be eliminated from the natural cycle to prevent any potential damage. Some toxics, such as battery cells, computer chips etc. are recycled at great hazard to the environment and worker health.

*Garbage* is the collective refuse resulting from comatose human lifestyle of convenience. These are the once-, twice- or several times-used items that we commingle in our bins. The very act of mixing causes the loss of value. Today's garbage typically consists of:

a) biodegradable substances (food wastes, flowers, garden wastes etc);
b) plastics (bags, toys and other items, white goods, water bottles, beverage containers);
c) glass
d) paper and cardboard
e) metal items
f) wood items
g) toxics such as pesticides, household solvents, detergents etc.
h) stone, concrete and other construction material
i) composites that are made of a combination of two or more of the above.

*Wastes* are items that are either so badly designed that they can neither be repaired, reused, re-sourced through composting, or safely recycled. Toxic substances, such as the synthetic pesticides, are one such category.

*Wastes* are also formed when various items are dumped together in a manner that they cannot be easily separated, or in a manner that renders them useless even if they are separated. Much of our resources end up as wastes primarily because we do not separate them before discarding.

For instance, if biodegradable wastes are thrown in with paper and toxics, the entire garbage becomes toxic. The biodegradables cannot then be composted because the compost would be poisonous. The paper cannot be recycled because it becomes too wet and dirty for anybody to want to pick it up to send to a recycler.

**Conventional Garbage Management**

The conventional method for managing garbage is essentially waste management. In other words, mixing the useful with the useless and other inherently wasteful items creates garbage, which wastes the inherently contained resources. Waste management presupposes that the resources discarded by consumers are a "waste" and then goes on to manage the wastes by devising technologies to collect it, transport it, bury it, dump it

or burn it. Waste management specialises in "disposing" wastes in landfills, incinerators or other machines that seemingly make these discards disappear. Such schemes are referred to as **mixed-waste disposal systems**.

*Landfills*

Landfills are stupid places or holes in the ground designed to receive "wastes." In India, there are no landfills. Low-lying areas are used to dump wastes. In industrialised countries, landfills are holes in the ground lined with plastic sheets and concrete to retard the pollution of the environment due to the poisons released by decomposing wastes.

The poisons from a landfill leak out from the sides in the form of a viscous, black, smelly and highly toxic liquid called **"leachate."** Leachates eventually escape into the ground surrounding the landfills by eating into the liner system and contaminate the nearby and underground water sources.

It is common knowledge, and even the conservative US Environment Protection Agency admits this, that all landfills will leak. Additionally, landfills also lend to air pollution and attract vermin and disease causing vectors. Landfill fires, another common incident for landfills, are a major source of air pollution releasing heavy metals and other super-toxic substances such as dioxins and furans into the atmosphere.

Because many of these problems are obvious and because landfills are glorified waste dumps, they are never located near communities that have the resources to resist it. Inevitably, landfills are located only among politically and economically oppressed communities even though a bulk of the wastes that end up here are generated by richer, politically influential communities living in faraway places.

*Incinerators and Open Burning*

Conventional waste disposal relies significantly on burning garbage, either in the open (as is common in India) or in machines. The machines (incinerators) vary in sophistication from basic tandoor ovens with a chimney to clean-looking multi-storied Swiss facilities that resemble five-star hotels. Regardless of the level of sophistication, all incinerators are inherently wasteful, polluting and presenting a financial drain, often unmanageable for the host community.

Incinerators are wasteful because they burn resources that rightfully ought to be conserved for sharing with our future generations.

Incinerators are inherently polluting because incineration or open burning involves the combustion of diverse items, they inevitably release poisons such as heavy metals, and cancer-causing chemicals including several volatile organic compounds and dioxins and furans. Advanced pollution control equipment cost a lot of money and merely trap the pollutants, concentrating them in the flyash and the bottom ash. Highly contaminated ash is usually disposed in special landfills (which will also eventually leak). In India, the MSW Rules recommend that incinerator ash should be disposed in landfills that are yet to be built.

*Centralised Composting*

Centralised composting subverts a perfectly sensible technology (composting) to deliver a poisonous end-product whose use as a soil conditioner further raises the danger of toxic

contamination of food grown on these soils. Centralised composting as it is practiced in India – such as at the Vilappilsala compost unit in Trivandrum, Kerala – receive mixed wastes which are allowed to sit for days or weeks before entering the compost process. During this time, poisons from the toxic components of the waste stream contaminate the biodegradable substances that will eventually be composted to form the soil conditioners. Plastics and other gross impurities, which are usually removed by a mechanical sieving process, are by this time too dirty to be viable raw materials for any recycler, and end up in a hole in the ground.

In a sense, **all mixed-waste technologies** – incinerators, landfills, centralised composting and waste-to-energy plants are doomed to failure.

**Waste Management: Past Experiences**

The Panchayat in Kovalam, which is responsible for hygiene related to municipal discards, has been unable to cope with the trash problem because of the magnitude of the issues involved, inadequate human/financial resources and a perceived lack of space. Interventions to handle the problem were piecemeal and geared towards collecting and shifting garbage around rather than addressing the core problems and causes.

In the absence of creative solutions, even collective well-intentioned efforts ended up transporting the problem elsewhere. For instance, the Kerala Hotel and Restaurant Association is spending almost Rs. 2 lakh[9] to moving the waste from Kovalam hotels and restaurants to outside regions, much to the anger of those local communities.

Burning the waste was another inferior method adopted by many establishments. This also invited the protest from tourists and local people. Burning of mixed wastes, especially in the PET bottle dumps, emit toxic gases and smoke. The people employed by KTDC to keep the Kovalam beach clean also collect and burn or bury the waste.

More recently, garbage from Kovalam has been shipped to *Vilappilsala* – the site of Trivandrum's centralised mixed-waste composting facility. The local *Ayalkoottam* was used for collection of the garbage. However, given the growing opposition to dumping in *Vilappilsala* by the community members, this option is neither seen as lasting nor just. Simultaneously, the residents of Kovalam blocked the construction of a road meant for transporting collected trash from shops to a transit station before shipping to *Vilappilsala*.

In 1998, the Department of Tourism proposed to install an incinerator of 30 tonnes capacity to burn the locally generated waste. Opposition from the people of Kovalam, aided by Greenpeace, Thanal and Bangalore-based tourism group Equations, was successful in defeating the incinerator proposal on the grounds that garbage burning is an environmental hazard. The Department of Tourism, which was receptive to the arguments, shelved[10] the proposal in July 2000. Simultaneously, Greenpeace and Thanal proposed the implementation of a zero waste program as the alternative to incinerators or other mixed-waste interventions.

"Towards Zero Waste Kovalam' draft report is a result of this proposal to the Department of Tourism.

**ZERO WASTE KOVALAM: THE WAY FORWARD**

Waste is the visible face of inefficiency. Zero waste aspires to eliminate inefficiency by eliminating waste. Waste management typically begins after garbage is created, and the more progressive waste management schemes may recommend segregation of wastes at source, recycling, reuse and reduction of wastes.

Zero waste goes beyond that to provide a guidance on what materials are permissible in society, how they should be designed, and how and who should handle the materials after their initial use. Western progressives define zero waste as a system that moves society from the 20th century notion of waste management based on the 3Rs – Recycle, Reuse, Reduce – to the 21st century mandate of resource conservation based on the 3Es – Economics, Efficiency, Ethics.

Not only should society's attitude to resources emphasize economy and efficiency in use, it should be ethical. Dumping one's waste in a landfill located near another community is unethical and exploitative. So is the destruction of resources by burying in landfills or burning in incinerators. Inherent in the notion of ethics is the concept of simplicity and fairness.

Most importantly, sorting and processing recyclables sustains between 5-10 times more jobs than landfilling or incineration. In the context of Kovalam, the potential for creation of additional jobs exits in remanufacturing and manufacturing of alternatives to replace problematic materials such as plastic containers, bags and bottles.

In a sense, zero waste with its emphasis on frugality, community revitalization and the reuse culture is an easy concept for Indians to relate to. However, the relatively new buzzwords such as recycling require to be dealt with caution.

**Recycling: The Pitfalls**

*Not all materials are recyclable.* Toxic substances, though recycled, ought not to be. When you recycle a hazardous substance, you also recycle the hazard. Take, for instance, poly vinyl chloride or PVC plastic known as the poison plastic. Recycling of PVC is inherently polluting because PVC is typically pumped with a variety of poisonous substances such as heavy metal-based stabilisers, phthalates additives and chlorine as a principal component. These poisons are inevitably released in various forms – including as dioxins and furans — during recycling.

The way out of such toxic substances is to invest in identifying and deploying non-toxic alternatives, and in taxing the manufacturers of such toxic substances in a manner that gives them an incentive to break loose from the vicious cycle of profiting from poisons.

*Some materials that are recyclable ought not to have been produced in the first place.* For some materials like aluminum cans or PET bottles, technologies to recycle without much harm to the environment or human health may exist. Nevertheless, what is technically feasible need not necessarily be economical, efficient or ethical. In India, consumer plastics such as plastic carry-bags and mineral water bottles, are barely a decade old in their currently popular form. Aluminum cans, introduced by Coke and Pepsi, are fortunately yet to gain widespread acceptance.

Aluminum production is highly energy intensive requiring massive amounts of electricity during the smelting and refining processes. Without exception, bauxite - the aluminum ore, is most likely extracted from forested lands after driving out the indigenous communities living there. Additionally, aluminum cans are among the most meaningless of inventions, designed to promote vanity rather than utility. Simply put, recycling should not end up encouraging the use of an inherently unsustainable material especially when safer, saner and sustainable alternatives exist.

**ZERO WASTE IN KOVALAM**

Kovalam's garbage in the tourist season is rich in plastics, particularly PET bottles and plastic carry bags, and biodegradable material consisting primarily of food scraps. Current practices for managing trash involve indiscriminate dumping, burying and open burning. As a result, the stench of decomposing organic discards, the sight of mangled PET bottles and the fluttering confetti of carry-bags mar the graceful splendor of Kovalam.

Any interventions to address this problem under the zero waste should:

a) INVOLVE local people and the generators of the garbage;
b) BOOST the local economy by generating entrepreneurial livelihood activities that are healthy, remunerative, meaningful and self-sustaining;
c) NOT be wasteful or propagate the use of wasteful materials;
d) NOT transfer the problem to a different community or lead to the creation of cross media pollution problems such as air pollution or groundwater contamination;
e) RE-ESTABLISH Kovalam as a tourist destination of choice.

For the purposes of the first phase, action needs to be taken in addressing comprehensively the menace of plastics and the current handling of biodegradable materials. For that reason, the sections below dwell on options for plastics and biodegradables.

Our draft plans for the second phase, to be launched next year, will focus on the other garbage streams.

**Segregate Now**

In the context of Kovalam, the garbage streams that cause maximum damage to the local economy (through aesthetic pollution – smell and sight] and local environment are sewage, plastics and biodegradable material such as food wastes and flowers. Regardless of the fate of the garbage, the first step to zero waste is the segregation at source of discards. As a starting point, Hoteliers, restaurateurs and other garbage generators should segregate and isolate the biodegradables and plastics discards from rest of the waste stream.

Segregation is a MUST to begin the journey towards zero waste.

**Biodegradable Material (Primarily Food Scraps)**

A segregation mechanism needs to be introduced as soon as the infrastructure exists to collect and transfer the segregated biodegradable material to a reprocessing facility.

*Zero waste options include* – proportioning food to clientele to minimize wasting; donating leftovers; use of source-segregated biodegradable material as feed for piggeries; direct application to agricultural land; conversion to soil amendments through composting, vermicomposting etc; recovery of energy via biogas reactors. Some interventions such as direct application to agricultural land require special attention and caution.

Zero waste *options do not include* open dumping; disposal in landfills or other mixed-waste facilities like centralised composting; or incineration.
Biogas reactors that feed on source-segregated and uncontaminated biodegradables such as food scraps convert biodegradables into combustible hydrocarbon gases and usable soil conditioners. Composting is less capital-intensive, generates valuable compost and has the advantage of being simple to maintain. Easily accessible composting and vermicomposting technologies allow for easy deployment of composting in Kovalam at shop level, hotel level to shared composting facilities between several restaurants, hotels and

Land is available, for biogas reactors and/or composting facilities, both within the premises of many of the generators or as pieces of land in various locations that can be used cooperatively among several facilities.

**PET bottles**

The problems with PET bottled water is not merely the blight and alternate plastics market. In a place like Kovalam, located as it is in a region of abundant rainfall, a high water table and fresh water running through several *Thodus*, it is a pity that there is no potable water clean enough for human consumption. The zero waste vision would necessarily have to strive towards systems that revive the local water sources and rebuild the community's respect towards water. For this, the garbage dumping, and more importantly, sewage problems need to be addressed.

PET bottles may be technically recyclable. However, PET is a non renewable fossil-fuel based derivative and therefore inherently wasteful of energy. Also, alternative materials exist to the usage of these plastics in this form to carry 1 liter and 500 ml of water. Currently, there are no local markets for PET bottle recycling and invariably diversion will incur transportation impacts to far away locations such as Coimbatore or Chennai where there is infrastructure to recycle PET.

As an interim measure, various shops may deploy bulk water dispensers, and tourists should be encouraged to use these at a cost to refill their water bottles.

**Plastic Carry Bags**

Plastic carry bags in their current level of popularity (or notoriety) are merely a decade old in most of India. The fact that people ate fish, purchased groceries, food, drank spiced buttermilk and carried odds and ends from the beginning of commerce until a decade ago clearly indicates that plastic carry bags never were an integral part of life. In a sense, that allows for an easy transition to a life without plastic carry bags.

The Zero Waste recommendation for plastic carry bags would recommend the speedy introduction of containers and bags locally manufactured with materials such as paper, cloth, coir, leaves, coconut shells and clay. Manufacturing with these material is a moderately skilled craft that may constitute a meaningful income for community entrepreneurial initiatives by youth, women or unemployed men.

This must go in hand with village directives and local government initiatives to discourage the use of plastic carry bags. In a sense, the phase out of plastic carry bags ought to be done in a manner so as to generate local jobs in the manufacturing of the replacements using traditional materials.

**Plastic Milk Sachets**

Milk in half-litre plastic sachets is the most commonly purchased mode of packaging. The plastic sachet (Low-density Poly Ethylene] has a market for recycling. Currently, many of the establishments collect the milk sachets. But in the absence of a mechanism where these collected sachets can be transported to the recycler, many milk users either dump or burn the sachets they collect.

In the near term, a simple system where a small team of collectors collect the accumulated milk sachets from the various establishments at regular intervals. The sachets can then be delivered in bulk to the local recycler.

Simultaneously, efforts may be made by larger milk-users, such as some of the big hotels, to explore the purchase of milk in large reusable containers supplied by Milma or other dairies.

**Toxics**

This garbage stream is a problematic one, not merely because of the difficulty in dealing with this in a safe manner, but also because of the variety of forms it comes in. Battery cells, cleaning solvents, household pesticides, fluorescent lamps, soaps and detergents, PVC plastic items including some packaging. Because toxics comprise of varied streams, different levels of interventions are required for different streams. For instance:

> Battery Cells and fluorescent lamps: Collection and take-back by manufacturer. Selected shops may be used as drop off points for used batteries/lamps.
>
> Cleaning solvents, household pesticides, soaps and detergents: Because they are manufactured in big factories in far away places, many of these products represent a drain on the local economy. Also, by polluting the local environment, they add to the community's expenses through increased health care costs, increased dependence on outside sources for water and potentially lost tourism revenue.
>
> Non-synthetic and less toxic alternatives for most of these applications exist using natural formulations. High-quality products catering to the above demands can be produced locally for the local market. The effort must be to train local entrepreneurs into manufacturing and/or marketing natural solvents, pesticides and pest control practices, soaps and detergents.

**Packaging**

The industry should be prohibited from using short-life non-biodegradable material for packaging, or made to take responsibility for the collection and disposal of packaging material. Action is required at a higher level – that of the State or Union Ministry to initiate product take back policies or financial disincentive to use certain materials for packaging.

Tetrapak recycling is technologically intensive because they are made of composite materials including paper, aluminium and plastic. Alternatives and options are to be identified for local solutions.

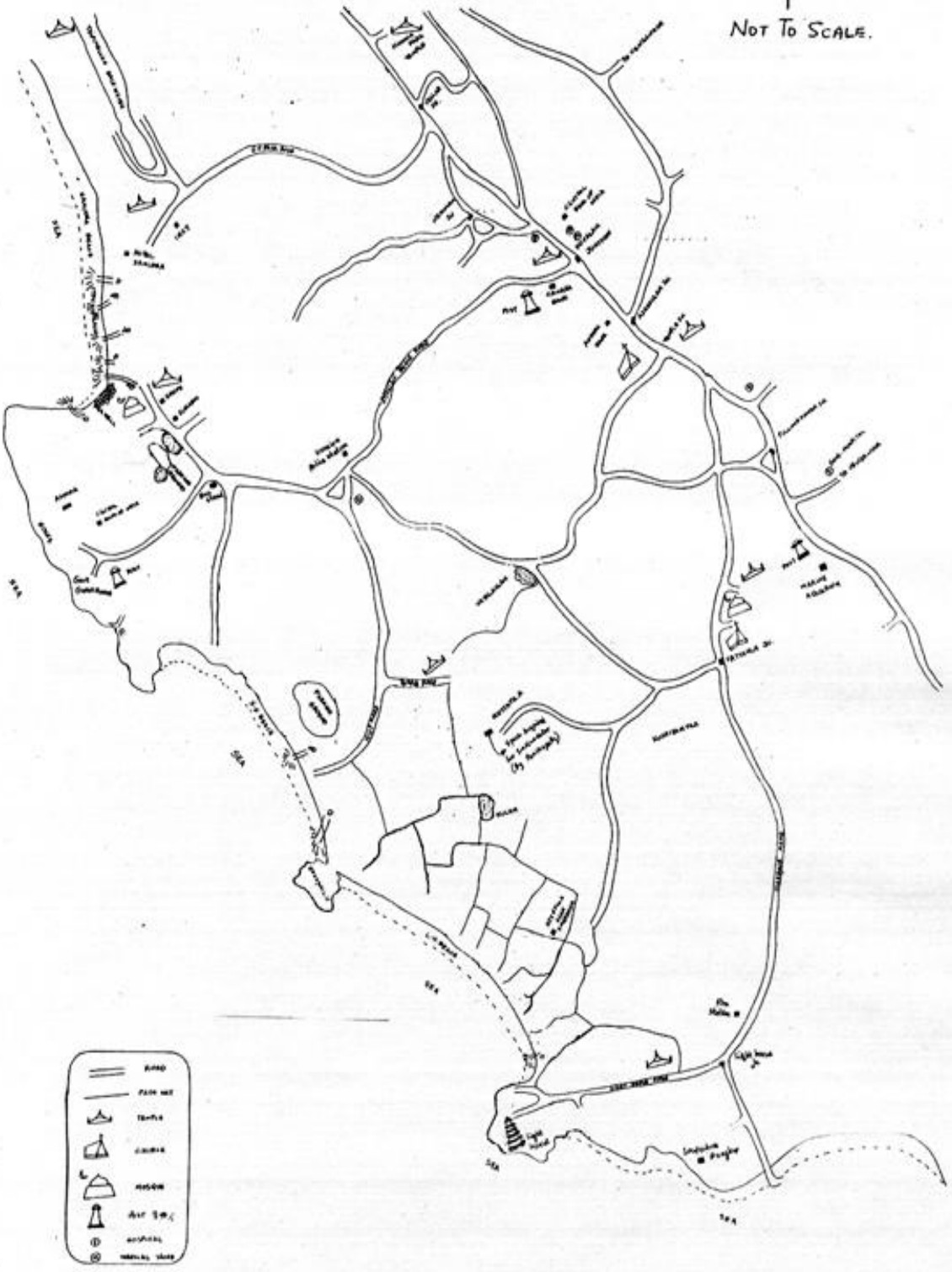
**Glass and Paper**

Both paper and glass are currently collected and recycled. However, it still finds it's way into the mixed waste stream. Because of the ready market for both items, a simple awareness program to educate generators of glass and paper discards to segregate and to collect via clear directives on posters and signage. These combined with an efficient transportation system that is linked to recycling facilities can effectively address these material streams.

# MAP SHOWING TOURIST VILLAGE OF KOVALAM

N

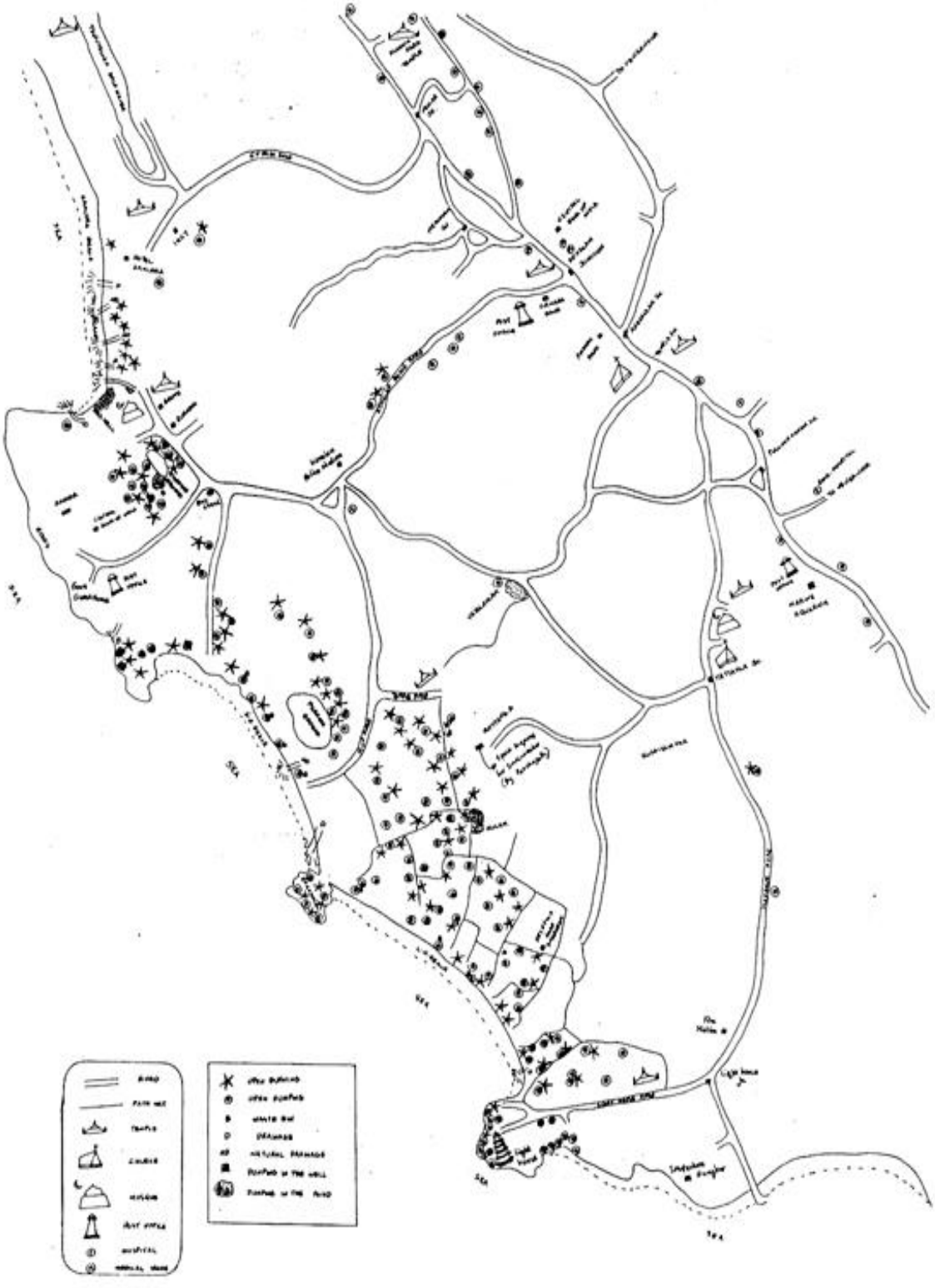
NOT TO SCALE.



MAP SHOWING DUMPING AND BURNING SITES
IN THE TOURIST VILLAGE OF KOVALAM.

N

NOT TO SCALE



**REFERENCES**


1. Development Plan for Kovalam-Vizhinjam Area, Kovalam -Vizhinjam Development Authority 1978.
2. Sketch Map of Kovalam – Dept. of Tourism, Govt. of Kerala
3. Development Report – Vizhinjam Grama Panchayath – 1996
4. Development Plan for Kovalam-Vizhinjam Area, Kovalam -Vizhinjam Development Authority 1978.
5. Tourist Statistics – 1997, Dept. of Tourism, Govt. of Keralam
6. Tourism Vision-2025, Dept. of Tourism, Govt. of Keralam.
7. Tourist Statistics-1986, Dept. of Tourism, Govt. of Keralam
8. Development Report – Vizhinjam Grama Panchayath – 1996
9. Tourism India, Vol-1, Issue-7 January 1999.
10. 'The incinerator Proposal at Kovalam to be shelved'. The Hindu, July 29, 1999.


**BIBLIOGRAPHY**


1. Tourism India, Vol-1, Issue-2, May-June 1998 (Mal)
2. Tourism India, Vol-1, Issue-2, May-June 1998 (Eng)
3. Tourism India, Vol-1, Issue-3, July 1998 (Mal)
4. Tourism India, Vol-1, Issue-3, July 1998 (Eng)
5. Tourism India, Vol-1, Issue-4, September 1998 (Mal)
6. Tourism India, Vol-1, Issue-6, November-December 1998 (Mal)
7. Tourism India, Vol-1, Issue-7, January 1999 (Mal)
8. Express Hotelier and Caterer, Vol-3, Issue-7, December 30, 1996 (Eng)
9. M.B.C.C Health Magazine, Vol-1, Issue-1, January-February 1999 (Mal)
10. Backwaters, April-2000 (Eng)
11. AN Letter Vol-4, Issue-3 October 1996 (Eng) Equations – Bangalore
12. Kerala Tourism Dossier 1994, Equations- Bangalore
13. Tourism Doc – Keralam 1996, Equations-Bangalore
14. Issues of Women in Tourism, September-1998, Equations-Bangalore.
15. Discussions on Tourism Development in Keralam, September 1999. Equations-Bangalore
16. Documentation Update, March 2000, Equations-Bangalore
17. Kerala Exploring future frontiers in tourism development, July 2000, Equations-Bangalore and Dept. of Tourism Kerala.
18. Continuing Saga of Marginalisation – March 2000, Equations-Bangalore
19. Vijayakumar B.,Impact of Tourism Development- A Pilot Study of Kovalam Beach, April 1993, University of Kerala
20. Christina Kamp., Kovalam Paradise Lost?, ASA Study Report, 1989-90.
21. 'Vikasana Rekha- Vizhinjam Grama Panchayath -1996'
22. Mohankumar A., 'Varoo Daivathinte Swantham Nattilecku' Navayanam Annoor, 1992.
23. Jacob T.G., Tales of Tourism from Kovalam, Odyssey, Thiruvananthapuram, 1998.
24. Development for Kovalam-Vizhinjam Area. Town Planning Department, Adopted by Kovalam- Vizhinjam Development Authority. 1975.
25. Kerala Gazette. No. 403. 19th Jun 1978. SRO No. 572/78.
26. Deepa Krishnan, Ann S. Sunny et al. The favorite Destination of Domestic Tourists – A Study, 2000, KITTS
27. Manoj Kumar P.S., Jithesh R. Shyla U. 'Infrastructure Development for Tourism Promotion-A case study on Kovalam' 1998-99, KITTS-

Thiruvananthapuram.
28. Statistical Abstract of Kerala, Bureau of Economics and Statistics, Kerala, 1974.
29. Economic Review-1988, State Planning Board, Thiruvananthapuram.
30. Economic Review-1990, State Planning Board, Thiruvananthapuram.
31. Final Population Totals, Director of Census Operations, 1991.
32. Statistics for Planning-1993, Dept. of Economics and Statistics Thiruvananthapuram.
33. Economic Review-1994, State Planning Board, Thiruvananthapuram.
34. Quick Tabulation Results, Census of Minor Irrigation Schemes – 1993-94, Dept. of Irrigation, Thiruvananthapuram, 1996.
35. Panchayath Level Statistics-Thiruvananthapuram District, Dept. of Economics and Statistics-1996.
36. Statistics since Independence, Dept. Of Economics and Statistics- 1998.
37. The End of Waste, Zero Waste By 2020, Zero Waste New Zealand Trust-2000.
38. Gita Wolf, Anushka Ravisankar, Orijit Sen, 'Trash –on Rag picker Children and Recycling', Tara Publishing and Books for Change, 1999.
39. Teresa Cannon, Peter Davis, 'Lonely Planet-Kerala' Lonely planet publications- January 2000.
40. Robbin Murray, Creating Wealth from Waste, Demos-1999.
41. Industry and Environment,Vol-7 no.1. Jan/Feb/Mar-1984 UNEP.
42. Industry and Environment,Vol-9 no.1. Jan/Feb/Mar-1986 UNEP.
43. Monograph on Solid Waste Management, CEE-south. Bangalore-1994.
44. Jorg Seifert-Granzin, Samuel Jesupadam, 'Tourism at the Cross roads-Challenges to developing countries' Equations – Bangalore and Tourism Watch-Germany 1999.
45. Franziska Jantsch, Heino Vest, 'Management of Solid and Liquid Waste at Small Health Care Facilities in Developing Countries', GTZ- Germany, 1999.
46. Interim Report of the Committee Constituted by the Hon. Supreme Court of India on Solid Waste Management in Class I Cities In India-June 1998
47. The Environmental Impact Assessment Notification (ISO-60(E)-1994- Ministry of Environment and Forests, Govt. Of India, New Delhi-1994
48. Coastal Zone Management Plan of Kerala- Dept. of Science Technology and Environment- Govt. of Kerala. CESS-December 1995.
49. Ministry of Environment and Forests Notification on Amendment of CRZ, 3rd January 2001. New Delhi
50. Ministry of Environment and Forests Notification on Amendment of CRZ, 12th April 2001. New Delhi
51. Draft Tourism Vision 2025- Dept. of Tourism, Govt. of Kerala, 2001.
52. Del Norte Zero Waste Plan, Del Norte Solid Waste Management Authority. Del Norte County, USA.1992
53. Loise Marie Gibbs, Dying from Dioxin, South End Press, Boston-1995.

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