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Initiatives to reduce Plastic Waste in Tamil Nadu



ENVIS Centre, Department of Environment, Government of Tamil Nadu
Panagal Building, No.1, Jeenís Road, Saidapet, Chennai-600 015. Tel: 044 24331243
Fax: 044 24336594 Email: tn@envis.nic.in Website: www.tnenvis.nic.in



Throw-away Plastics and their impacts

Plastic is a very useful commodity but its disposal is a great problem. Plastics are durable and degrade very slowly. Plastics are used in an enormous range of products from paper clips to space ships. Around the Globe, about one-third plastics are used for packing and another one-third for building construction.

Plastic bags were introduced in 1970s and gained an increasing popularity among consumers and retailers. Plastic has become ubiquitous and life without plastic cannot be imagined in the current era of human development and growth. Almost every article of day-to-day use is either plastic or has plastic component in it. Plastics find wider applications and are available in huge numbers and varieties across the world. It is estimated that roughly around 500 billion plastic bags are used every year worldwide (Report of Chief Water Analyst, King's Institute, Chennai). Widespread usage of plastics is mainly due to their universal application, relatively lesser cost and their convenience in use. It is for the same reasons, majority of plastic bags are discarded as waste usually after a single use. In India, consumption of major plastics is estimated to be about only 3% of global consumption i.e. about 4 million tonnes annually (CIPET, 2003).

Negative impacts of un-scientific plastic waste disposal

Health effects in use: Many additives are used in the plastic product processing, which include plasticizers, lubricants, stabilizers, colourants and anti oxidants. The chemicals used in the form of

phthalates, plasticizer, stearic acid etc., are bio accumulated in the metabolism of the living organisms, which act as hormone mimicking chemicals in the life cycle. These chemicals would act as a barrier in deciding the gender and also reduce the fertility rates in the living organisms with special reference to animals. People are exposed to these (plastic) chemicals by using plastic packages. The hot and fat food usage habits of the people including procuring meat / fish in recycled plastic bags, packing hot food items like sambar, soups etc. in plastic pouches, eating food served in plastic sheets in hotels, hot coffee/tea packed in plastic bags, packaged drinking water left in the closed rooms/vehicles in hot weather, food cooked in micro wave oven along with plastic packaging materials become the most common source for direct contact of these food stuff with the plastic chemicals.

Leaching of toxic materials and contamination of soil and ground water: Though there is no direct scientific study on leaching of toxic materials which contaminate the soil and ground water, the overall impact on the ground water and soil contamination have been studied in the Perungudi dumpsite of Chennai Corporation. Damage to environment, particularly pollution caused to soil and water due to unscientific land disposal of plastic wastes along with domestic garbage is of significant concern, especially when such plastic wastes are dumped near water bodies.

Hazards from open, uncontrolled burning of plastics: When the volume of garbage accumulating in the dump sites and other public and private places become uncontrollable, sanitary workers of the local bodies tend to set

fire to the municipal garbage along with the plastic waste, which creates severe environmental damage. The flexible plastics, which constitute a major portion of the plastic waste in the dump yard or the temporary transit points, have plasticizers like phthalates. The presence of chlorine will definitely release HCl gas due to burning of plastics and the toxic chemicals ranging from paints to dyes are also emitted when burnt in open conditions. The smoke from burning plastics contains emission like dioxin and furan, which leads to serious health impacts when inhaled.



Impact on Soil infiltration: The plastics when discarded on soil do not permit the rainwater to percolate into the soil and reduce the overall recharge of ground water. One plastic carry bags extend over one to four square feet of area and millions of carry bags when discarded over the land create severe and cumulative stress in the ground water recharge. It's a common site of getting plastic dumps when the earth is excavated for construction activities within or adjacent to the residential habitations. These buried plastics are seen at different depths, which totally prevent the percolation of ground water for recharge.

Blockage of storm water drain: Because of the inherent hydrophobic property of plastic, the plastic wastes when disposed in drain neither get wet or disintegrated by the running sewage/storm water in drains. The plastic waste accumulated over the surface of the water bodies prevents the designed flow of the sewage, causing mosquito breeding in the area. Plastic wastes when dumped near road sides, open plots, riverside, public places not only affect the environmental scenario,

but also become the major reason for overflowing of water due to blockage in sewer / storm water drains resulting in flooding of that area during rainy season. Blockage of sewerage systems by plastic bags is becoming a common problem in cities and towns of developing countries. This in turn creates foul smell and favourable habitats for mosquitoes and other vectors that could spread many diseases such as Dengue fever, Chikungunya etc. Clearing of the storm water drains and open channels of the accumulated plastic wastes entails huge additional man power and cost to the concerned local body.



Death of livestock: In our cities, cattle walk around freely. There are so many goats and cows that have died after ingesting the plastic bags thrown on the roadside. When the cattle swallow a plastic bag, it will not be digested because it does not dissolve, blocking the intestines of the cattle thereby causing death to the animal. The disposed packaging of foodstuff in forests when taken by the wild animals like elephants, tigers, bears and monkeys leads to their pitiable deaths. Animals such as Dolphins, Sea Turtles, Whales and Penguins are killed every year due to plastic bags, consumed mistakenly for food.



Various initiatives taken by the Government of Tamil Nadu to tackle the disposal of throw-away plastic waste

In recent times, emphasis has been placed by the Government of Tamil Nadu in conceptualizing suitable ways to tackle the problems associated with the use and disposal of plastics. Some of the initiatives/concepts are as follows:

1. Plastic wastes used for re-laying of roads:

Plastic roads is a boon to the State of Tamil Nadu as the weather is hot and extremely humid with torrential rains creating havoc, leaving most of the roads with big pot holes. Re-laying of plastic road technology involves use of bitumen mixed with plastic wastes in the ratio 9:1. Plastic wastes are collected and shredded into minute pieces through women self help groups.

The roads relayed with plastic wastes have increased binding and better bonding quality, pothole free and prevents leaching of plastics. These roads are stronger having more stability hence it can withstand heavy load and traffic. These roads provide better resistance towards rain



water and water stagnation. Necessary conditions are that, the plastic wastes should be shredded between 1.6 mm to 2.5 mm size. Temperature maintained during the process of mixing the granite stones and shredded plastic should be around 170°C. Temperature around 110°C is to be maintained while laying the road with bitumen mixed with granite stones coated with the molten plastic wastes.

In this initiative, use of bitumen for road construction is reduced by weight around 10% by using plastic wastes, which results in savings of approximately Rs.50,000 per km. Along with

the women self help groups, schools are also joining this move by collecting the domestic plastic wastes through students and in turn is supplied for road construction. Through this initiative, the villagers are also involved in this similar process and thus keeping a clean environment.

2. Information, Education & Communication for Sensitizing the public to eschew non-degradable plastic:

The minimization of the usage of plastic carry bags is possible only, if the public is fully aware of the health and environmental impacts caused by the disposal of these plastic wastes after its intended use. The awareness campaign are through all possible media like print media, local cable television, visible display boards / paintings, rallies etc. The



Department of Environment, Government of Tamil Nadu in collaboration with various NGOs like the DHAN Foundation and Arumbugal Trust organized the Information, Education and Communication campaign to eschew non degradable plastics. The events were organized in all the districts of Tamil Nadu by involving the school students, men and women SHG members, NGC volunteers and general Public. All the district collectors and the Chief Education Officers concerned gave whole hearted cooperation for the participation of not only the NGC volunteers but also all the other students.

3. Awards for encouraging the collection of throwaway plastics:

The reduction or avoidance of plastic carry bags, cups etc., needs encouragement. Therefore the Government of Tamil Nadu announced an incentive programme

with cash awards. These State level awards for the best three plastic free villages, best three self help groups who played a vital role in plastic removal and best three plastic free, clean and green schools were distributed by the Hon'ble Minister for Environment, Thiru M.C. Sampath, during the World Environment Day celebrations held on 5th June 2013 at the Tamil Nadu Pollution Control Board, Chennai. plastic carry bags, cups etc., needs encouragement. Therefore the Government of Tamil Nadu announced an incentive programme with cash awards. These State level awards for the best three plastic free villages, best three self help groups who played a vital role in plastic removal and best three plastic free, clean and green schools were distributed by the Hon'ble Minister for Environment, Thiru M.C. Sampath, during the World Environment Day celebrations held on 5th June 2013 at the Tamil Nadu Pollution Control Board, Chennai.



4. Co-incineration in Cement Industry: The Plastic waste can be used as supplementary fuel in cement industry upto 1.5% of the coal used in the process as the average calorific value of plastic



waste is 8200 kcal/kg. The 3Ts - Time (4 seconds), Temperature (1400°C) and Turbulence in Cement Kiln ensures complete destruction of organic compounds present in plastic wastes. The co-incineration of plastic waste in cement kiln is

an approved method by the CPCB, Delhi. The absence of other foreign materials in the plastic waste and regular supply from the local bodies are the pre-requisites to the effective and continuous functioning of co-incineration of plastic waste. It is noted that in Tamil Nadu, the utilization of plastic waste for co-incineration is practiced in two cement industries.

5. Strict implementation of the provision of Plastic Waste (Management and Handling) Rules 2011:

The Tamil Nadu Pollution Control Board is responsible for enforcement of provisions relating to registration, manufacture and recycling of plastic carry bags as prescribed in the Plastic Waste (Management and Handling) Rules 2011. At present, the Board ensures the manufacture of carry bags not less than 40 microns thickness with the required specification for recycling as well as compostable plastics.

6. Encouraging the use of conventional and naturally made products:

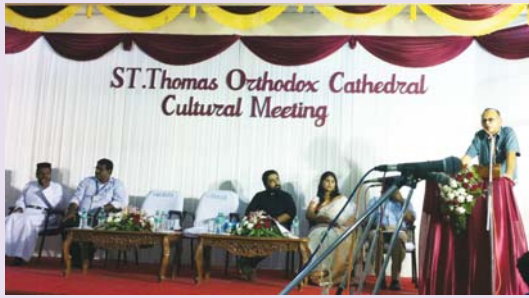
The usage of plastic sheets for serving foodstuff in hotels are being discouraged and the traditional use of banana leaves, arecanut plates, lotus leaves etc. are to be encouraged. Likewise, the use of cloth bags, jute bags, paper bags etc. instead of plastic carry bags in all commercial establishments are being promoted. The Self Help Groups in the locality are encouraged to produce and supply paper bags or jute bags and this is considered as a measure for the group's revenue generation.



7. Fuel Derivatives: Plastic waste is turned into energy by converting the same to petrol, diesel and heavy fractions through depolymerization process adopted in some industries and 1 kg of this plastic waste yields approximately 0.78 kg of final product which consists 20% petrol, 50% diesel and 30% heavy fractions. This process does not produce the large amount of secondary waste, emission or poisonous by products. This process is being tried out in a pilot scale by a few Industries

EVENTS

Cultural programme on environmental issues at St. Thomas Orthodox Cathedral



Thiru Mohan Verghese Chunkath, I.A.S., Additional Chief Secretary, Environment and Forest Department delivered the keynote address during the cultural programme on environmental issues conducted by the St. Thomas Orthodox Cathedral School, Chennai-108, on 7th July 2013. He highlighted the importance of environment and the role played by school children in conserving it. Tree saplings were distributed to the school students. The Principal of the school and other dignitaries like Dr. H. Malleshappa, I.F.S., Director, Department of Environment took part in the programme. More than 500 students participated in the programme.

Inauguration of Peoples Club at M. O. P. Vaishnav College for Women, Nungambakkam

The peoples-club of M. O. P. Vaishnav College for Women, Nungambakkam, Chennai was inaugurated by Dr. Jayanthi M., I.F.S., Additional Director, Department of Environment on 4th September 2013. She delivered the Inaugural address and spoke on eco-friendly projects the students can do on the World Environment Day 2013 theme "Think-Eat-Save". She also spoke on reducing the use of plastics in the college campus and different methods of greening like vertical gardens, roof gardens etc., in urban areas. She also pointed out that the women students are the key for environmental conservation for the next generation. More than 100 students participated in this event.



One day seminar/training for the National Green Corps (NGC) Teacher coordinators and students at Nungambakkam, Corporation Girls Higher Secondary School, Chennai

The Department of Environment, Government of Tamil Nadu in collaboration with the TWAD Board, NICE Chemicals Pvt. Ltd., and Ashashara Enterprises conducted a one day seminar/ training for NGC teacher coordinators and students at the Nungambakkam, Corporation Girls Higher Secondary School, Chennai on 7th September 2013 at 10.00 AM. Dr. Jayanthi, M., I.F.S., Additional Director, Department of Environment, welcomed the NGC teacher coordinators and the student participants. Dr. H. Malleshappa, I.F.S., Director of Environment, delivered the inaugural address. The Director urged the participants to suggest ways to improve the functioning of the NGC programme in the future by conducting more awareness programmes in addition to the regular NGC activities.



After the inaugural address the Director of Environment released the NGC teacher coordinator's work diary prepared by an expert panel especially for the NGC activities. He also released a book titled "Suzhal Pookal" published by Mr. A. Bernardet, NGC district coordinator, Ramanathapuram District. The technical session included a training provided by officials from the TWAD board on the use of soil, air and water testing kits. The training was provided by Tmt. Vasanthi Lawrence, Chief Water Analyst and Dr. Chandrika, Assistant Water Analyst, TWAD Board. More than 100 students and NGC teacher coordinators participated in this workshop.





INTERNATIONAL OZONE DAY 2013

“Healthy atmosphere, the future we want”

On December 19, 1994, the UN General Assembly proclaimed September 16th to be the International Day for the Preservation of the Ozone Layer, commemorating the date when the Montreal Protocol on Substances that Deplete the Ozone Layer was signed in 1987. The day was first celebrated on September 16th 1995. This commemoration around the world offers an opportunity to focus attention and action at the global, regional and national levels on the protection of the ozone layer present in the stratosphere which protect us from harmful ultraviolet rays.

The 2013 theme of the Ozone Day is – ‘A healthy atmosphere, the future we want’. This year the International Ozone day was celebrated by the Department of Environment and Tamil Nadu Pollution Control Board, at the Marina Beach, Chennai. On this occasion a human chain was held with the participation of about 350 NGC / Eco club students from various schools in Chennai. Dr. H. Malleshappa, I.F.S., Director of Environment, highlighted the simple steps students can take to protect the ozone layer.








Pamphlets containing the message to protect the Ozone layer were distributed to the public on the Marina Beach. Dr. Jayanthi, M., I.F.S., Additional Director, Department of Environment and other senior officers from Department of Environment and Tamil Nadu Pollution Control Board, participated in this event.



Snippets of other events

- ◆ Dr. Jayanthi, M., I.F.S., Additional Director, Department of Environment participated in the Training programme for IAS Probationers at Anna Institute of Management, Chennai on 11th July 2013.
- ◆ Dr. H. Malleshappa, I.F.S., Director of Environment, participated in the Workshop on “Green Economy for Tamil Nadu Inclusive Growth and Sustainable Governance” at State Planning Commission on 16th July 2013.
- ◆ Dr. H. Malleshappa, I.F.S., Director of Environment, participated in the Workshop on Solid & liquid resource Management at, State Planning Commission on 23rd July 2013.
- ◆ Dr. Jayanthi, M., I.F.S., Additional Director of Environment participated in the two days training workshop on “Bio-Propecting and The Role of State Forest Department” at IFGBT, Coimbatore on 1st and 2nd August 2013.
- ◆ Thiru Mohan Verghese Chunkath, I.A.S., Additional Chief Secretary, Environment and Forest Department presided over and delivered the keynote address during the workshop on ‘Climate Change Adaptation’ conducted by CCCAR, Anna University on 11th September 2013

Different types of plastic polymer and their domestic, commercial and industrial applications

Plastic Identification Code	Type of plastic polymer	Common Applications
	Polyethylene Terephthalate (PET)	Soft drink, water and salad dressing bottles; peanut butter and jam jars
	High Density Polyethylene (HDPE)	Water pipes, Hula-Hoop (children's game) rings, Milk, juice and water bottles; occasional shampoo / toiletry bottle
	Polyvinyl Chloride (PVC)	Juice bottles; cling films; PVC piping
	Low Density Polyethylene (LDPE)	Frozen food bags; squeezable bottles, e.g. honey, mustard; cling films; flexible container lids, carry bags
	Polypropylene (PP)	Reusable microwaveable ware; kitchenware; yoghurt containers; margarine tubs; microwaveable disposable take-away containers; disposable cups; plates
	Polystyrene (PS)	Egg cartons; packing peanuts; disposable cups, plates, trays and cutlery; disposable take-away containers
	Other (often polycarbonate or ABS)	Beverage bottles; baby milk bottles; electronic casing

ENVIS Team

Dr. H. Malleshappa, I.F.S.,
Director

Dr. Jayanthi M., I.F.S.,
Additional Director

Dr. J.D. Marcus Knight
Senior Programme Officer

Mr. K. Muthukumar
Programme Officer

Ms. S. Indra Devi
Programme Assistant

Ms. M. Shanthi
Data Entry Operator

Editorial Board: Editor-in-chief: Dr. H. Malleshappa, I.F.S., Editor: Dr. Jayanthi M., I.F.S., Associate Editor and Design: Dr. J.D. Marcus Knight, Printed at M.R. Graphics, Chennai - 2.

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