ICPE
INDIAN CENTRE FOR PLASTICS IN THE ENVIRONMENT

Envis Eco-Echoes

Management of Plastics, Polymer wastes and Bio-polymers and impact of Plastics on the Eco-system

Sponsored by Environmental Information System
Ministry of Environment & Forests, Government of India

Quarterly Publication of Indian Centre for Plastics in the Environment

Vol. 12 | Issue 2 | Apr - June, 2011

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Envis Eco-Echoes

Volume 12 • Issue 2 • Apr-June, 2011

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Area of Activity

Capacity Enhancement Programme on Management of Plastics, Polymer Waste and Bio-Polymers, Impact of Plastics on Eco-System

Editorial

Perhaps for the first time ever, a media major in India – NDTV, had taken initiative for creating the much needed public awareness programme in its television channels, against littering and for source segregation of waste at home. It went ahead to send the message to the general mass that plastics waste can be recycled to make various useful products of daily use. NDTV had organised an event – Greenathon, a long distance running event, by its team led by a celebrity, which started from Ahmedabad and ended at Mumbai on 5th June, 2011. During the period the team had visited, among others, plastics recycling facilities along the path of their running route and had observed the process of plastics recycling in different recyclers' / processors' plants. The event was directly telecast by the channel.

ICPE joined hands with NDTV and facilitated their visits to different recyclers. ICPE also had set up two 'Plastics Waste Collection Centres' – one at Carter Road, Bandra and the other at the Dadar beach area on the 5th June, 2011, for the collection of all types of plastics waste from the citizens. NDTV, through its network, had appealed to the citizens to come forward with all plastics waste for depositing to the designated Plastics Waste Collection Centres, so that the same could be diverted to the recyclers for processing.

In its studio, NDTV had organised for a discussion session with opinion leaders and celebrities to invite opinions on the subject – how the menace of plastics waste could be arrested. It was realised by all that plastics per se is not bad but its littering is creating the problem. The celebrities made appeal to the viewers that we should stop littering and use only waste bins for disposing the waste including plastics waste. The complete details of the programme, as shown in the channel, are available on ICPE website. Some pictures and a brief note on the outcome have been reported in this edition.

The view of Plastics Industries in Europe expressed through Plastics Europe - the Association body of the Industry, on various issues and challenges regarding Plastics Waste will be carried in this News Letter part by part. This edition reproduced the challenges to deal with Marine Littering.

Comments may be forwarded to ICPE ENVIS Centre.

Subscription Information:
ENVIS is sent free of cost to all those interested in the information on Plastics and Environment.

ICPE Submission during Environment Day - 05th June, 2011 on Plastics Waste Management Issues

Plastics have gained widespread usages - from the common household goods to high technology instruments. These have made significant contribution in the areas of food production and conservation, medical, safety and health care. Light weight yet tough, inert, excellent barrier properties, ease of moulding into flexible or rigid products, transparency when desired, low consumption of energy and least effect on environment during its production and processing - all these attributes have made plastics a preferred and indispensable part in modern day life. Its uses in Agriculture, Building, Automotive Components; Electrical & Telecommunication; Electronics and Appliance; House wares, Packaging of food and pharmaceuticals are some of the areas of major significance.

Plastics reduce the emission of Green House Gases and leave lower Carbon Footprint compared to alternative materials. Plastics have replaced wood in many areas, thereby, saving millions of trees. Despite all these positive attributes, plastics attract criticism due to inappropriate waste handling systems.

Often Plastics are accused of being a health hazard. The reality is that, plastic products are mostly inert. Plastic products have been implanted into vital human organs clearly disproving the myths. Plastics are used for packaging of blood and vital pharmaceutical products. Plastics Disposable Syringes are widely used in healthcare sector. There are clear national and international regulations / standards for usage of plastics that come into contact with food, pharmaceutical products and drinking water. Emissions and wastes emitted during the production of plastics are much less as compared to the alternative materials.

There are concerns raised that plastics being non – biodegradable, create disposal problem. While it is true that plastics are not amenable to biodegradation like other organic matters, many alternate materials such as glass, metals are also not biodegradable. Plastics packaging provides the highest 'product to packaging weight ratio' in the same shelf-life requirement, thus necessitating least material input for packaging.

LCA studies carried out for various products clearly prove that the energy required for production of plastics is much lower than that of alternate materials. Various emissions to air and water during the production are much lesser in case of plastics compared to the alternatives. Plastics being much lighter in weight save fuel during transportation. Thus non-biodegradability alone cannot be a consideration while deciding on the appropriate needs of a material. Biodegradation results in depletion of resources while reuse and recycle is more desirable.

Plastics in general and plastic bags / carry bags in particular are blamed as the major cause of Solid Waste problem. This is mainly due to the poor littering habit and inadequate infrastructure for management of solid waste. Due to this we find all types of dry waste, including plastics waste, littered in our surroundings. Plastics waste form only about 5% of the MSW stream inmajor Indian cities. There is no technical problem of disposing the plastics waste. Plastics waste can be 100% recycled. Very thin plastic bags, though per se not hazardous and are recyclable, are often left behind by waste pickers due to economic reason. These very light weight plastic film waste do not generate reasonable return to waste pickers and hence are left behind creating waste management problem. To avoid this, Ministry of Environment and Forests, Government of India had in 1999 and amended in 2003, come up with Rules restricting the thickness and size of plastic carry bags (20 micron / 20 x 30 cm). Some State Governments had further modified the rules by increasing the minimum thickness. State Governments in Maharashtra, Punjab, West Bengal, Himachal Pradesh, Goa, Kerala and Meghalaya have increased the thickness ranging from 30 to 70 microns. Delhi, Chandigarh and J & K Governments have, on the contrary, banned the use of plastics carry bags.

No developed country in the world has banned use of plastics carry bags. Plastics carry bags are widely used in USA, Canada, UK and the EU Countries and Japan without any size or thickness restrictions. There exist appropriate waste management systems to handle all types of MSW including waste plastic bags.

Alternatives to plastics bags would create additional environmental burden and would also inconvenience common people. Different types of plastics bags are available to suit different requirements. Plastics carry bags can be reused many more times as compared to Paper Bags thus leaving substantially lower environmental foot-print.

The solution lies in segregation of dry and wet solid waste at the source for which an effective mass awareness campaign is necessary. Creation of efficient Solid Waste Management infrastructure coupled with encouraging establishment of recycling centres would help address the MSW problem. Plastics can be recycled to produce articles for mass use augmenting the concept of resource management. Many useful products have been developed with recycled plastics and a large number of people are employed in these activities in small, micro and informal sectors.

Apart from the conventional recycling, which is popular in India, alternate processes of plastics recycling are also required to be encouraged. Low-end, mixed and co-mingled plastics waste can be used safely for co-processing in cement kilns. Industrial fuel can be produced from all types of mixed plastics waste. Plastics waste has been used to construct asphalt roads. All these processes have been successfully tried and established in Indian conditions.

A fruitful partnership between Government, Civic Bodies, Plastic Industry, End User industry and general public is required to be developed for evolving more sustainable solutions to Plastics Waste Management problems.

Media major - NDTV had taken initiative to come out with an awareness campaign on issues related to plastics during the Environment Day week (1st week of June 2011). During this campaign, which started with the Marathon Run between Ahmedabad and Mumbai by the Anchor – Shri Milind Suman, various environment related issues were covered – including that of plastics. NDTV team covered live demonstration of plastics recycling facilities in Manor, Daman and Mumbai. Conclusion drawn by the NDTV reporters during the live show was that – plastics per se does not create environment problem, poor littering habit does.

General mass was encouraged to segregate waste at source so that plastics waste could be recycled to manufacture various products of utility.

During 4th and 5th June, a special drive was initiated to encourage the citizens to deposit their plastics waste in a common place – "Plastics Waste Collection Centre" Two such collection centres were set up – one at Carter Road – Bandra and one at Dadar Beach. Similar centres were set up in Chennai and other places. Industry Members volunteered to man the Plastics Waste Collection Centres. All the collected plastics waste was later handed over to waste pickers group for forwarding the same to the recyclers. This is perhaps the first occasion when a major national level TV service operator showed the positive aspects of plastics.

All the video clippings have been compiled in a CD by ICPE for mass communication purpose. Soft copy of the NDTV Greenathon 3 Programme is available on ICPE website. Brief of the programme and the outcome has been reported.

Issue: Plastics Waste

Outcome of NDTV Programme on Environment Day – June 2011

1. Plastics are essential materials required for modern day living. They are essential to meet the material needs for advanced agricultural practices, food packaging, health care, construction and other sectors.

2. Plastics are required for safe and hygienic packaging of milk, bread, cereals, pulses and in our daily necessities at home in the form of household utilities and hygiene products. In our day to day living, plastics play an indispensible role.

3. There are myths surrounding plastics which are not based on scientific facts like it being a burden on environment and cannot be recycled. Both these are ill founded and not supported by any scientific analysis.

4. On the contrary, plastic products are energy efficient and ecofriendly if we are able to handle all Solid Waste (including plastics waste) through source segregation, collection and recycling.

5. Plastics, commonly used in the packaging industry, can be efficiently recycled. Recycling creates value and helps in Resource Management and at the same time it resolves the Waste Management issues and provide livelihood to tens of thousands. There is a wide range of useful products that can be made from recycled plastics. These are both common every day utility products as well as industrial products that provide excellent outlet to recycled material. Some common examples are : low-cost tarpaulin, garbage bags, nursery bags, niwar, beach mats, planters for saplings / plants, industrial crates, low-cost suitcases, agricultural ropes, waste bins, soap cases, toilet cleaning brushes etc. The list can be wide and extensive provided the product made does not come in direct contact for food and medical applications.

Apart from normal recycling process for making different kinds of useful products for daily use, there are Non Conventional Recycling / Recovery methods like:

(I). Conversion to Fuel
(ii). Usage in Road Construction
(iii). Energy recovery in cement kilns

6. Major challenges are:

a) Ensuring that plastic packaging wastes and disposed items including carry bags reach the recycling plants/ facilities preferably not mixed with wet waste.

b) Setting up of appropriate type of recycling facilities ensuring compliance with regulatory norms and also ensuring production of quality recyclate.

7. To overcome these challenges, there is a need for:

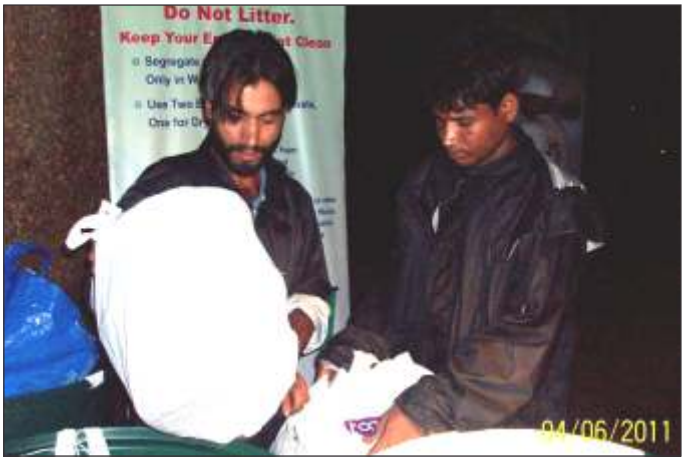
a) Setting up of Plastics Waste Collection Centres and establishing supply chain for plastic waste for recycling.

b) Maximizing source segregation to make collection process efficient and economically viable.

c) Creating Awareness Programmes on anti-littering and for waste segregation at source

d) Improving the infrastructure to support the above NDTV popularized the Plastics Waste Collection drive by inviting viewers of Mumbai and Chennai to bring plastics waste from their homes and deposit the same at select Plastics Waste Collection Centres, especially created on the Day with the support of ICPE and Regional Plastics Associations. Plastic waste was carted away by volunteers to a sorting / recycling unit. Token return gifts were distributed amongst visitors who brought significant quantity of plastics waste. Celebrities volunteered to support the NDTV initiative.

Glimpses from the Telecast



Glimpses from the Telecast

Marine Littering

Plastics Europe, the Association of Plastics Manufacturers in Europe had published in 2009 its position on various issues relating plastics in the environment.

The publication covered 5 key issues:

- the plastics industry's approach to waste management
- the challenge of dealing with the issue of marine littering
- facts about VCM and PVC manufacturing
- facts about the use of phthalate plasticizers in PVC
- facts about the chemical bisphenol A

In this edition of the ENVIS Eco-Echoes Newsletter, Plastics Europe's position on waste management is being reproduced from Plastics Europe's report.

The challenge of dealing with the issue of marine littering

Key Messages:

•The plastics industry is seriously concerned about the issue of marine litter. It is unacceptable that unwanted plastic is found discarded in marine and river environments.

• More effort is needed by all concerned to: improve waste management on shore and on vessels to educate and change littering behaviour.

• The industry is very active in promoting end of life waste management on land and is actively participating in workshops to discuss the problem and possible solutions of marine litter with experts.

• We need to find out if there are any cost effective solutions to removing plastic waste in the oceans that has accumulated over the past years.

• We need to better understand the consequences to the environment of the material that may remain in the ocean in years to come.

How much is plastic contributing to marine litter?

Marine litter is found in all the oceans of the world - not only in densely populated regions, but also in remote places far away from any obvious sources. Over the last few years it has become apparent that a large amount of debris is being collected by ocean currents into large 'gyres' in specific areas of the oceans (e.g. North Pacific). It has been reported that in certain areas of the ocean there are 46,000 pieces of floating plastic litter per square mile. If these estimates are accurate, then it is a serious messenger of a deep societal behavioural problem.

The fact that 83% of litter floating in the oceans has been found to be plastic is not all that surprising given that most other waste material entering water either sinks or disintegrates. The very slow rate of degradation of most marine litter items, together with the continuously growing quantity of the litter and debris disposed, is leading to a gradual, but steady increase in the quantities of marine litter in our oceans and world shores. The amount of plastic found on beaches varies from region to region.

• Recent surveys report that in the Mediterranean 40% of litter on the beaches and seabed is actually smoking related (cigarette stubs, packets etc), with plastic bottles and bags accounting for only 18%

• But plastic debris accounts for 58% of all litter found on UK beaches and 80% of the litter on Belgian beaches; and 30-60% of the litter on beaches in the Baltic is made up of plastic bottles.

The, recycling industry funded, Kaisei expedition, that recently returned from investigating the North Pacific 'gyre', should provide us with a better understanding of the extent of the problem of floating debris in the oceans.

How does the plastic in the oceans get there?

Unwanted plastic waste gets into the oceans via a number of routes.

• According to the United Nations Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP), land-based sources account for up to 80% of the world's marine pollution.

• The rest comes from ships, much of it thrown overboard illegally. The International Maritime Organisation (IMO) states that, "in some areas most of the rubbish found comes from passing ships which find it more convenient to throw rubbish overboard rather than dispose of it in ports."

• Poor waste management practices in ports and in landfill sites are also a source.

• 14% of waste found on beaches appears to be fishing related (fishermen and fishing boats losing or dumping nets, tackle and equipment) and most of this is plastic.In the Baltic for example although marine litter on the coast is typically from tourism and recreation, 24km of lost fishing net was collected in a 2004 cleanup.

• Only around 40% of litter on UK beaches appears to be traceable to beach visitors but in the Mediterranean more than 50% of marine litter originates from shoreline and recreational activities.

• Pre-processing plastic pellets from industry are also sometimes found on beaches. These may originate from containers toppling off container ships in bad weather (although a rare event, a single 20 tonne container holds about 50 billion pellets, which can spread a long way) ; or from poor housekeeping in plastics factories allowing pellets to be flushed down drains. But it's not just the plastic products industry that may be responsible for plastic pellets found in the ocean. Cosmetics producers also use micro-sized plastic pellets in skin care products (scrub) which are flushed with the waste water and may escape the waste water treatment plants and flow back into rivers.

How much is the plastic in the oceans harming wildlife?

Plastics are inert materials and a study published in 1997 reported that it was fishing gear, ropes, lines and strapping bands which mostly adversely affect larger mammals and birds, rather than plastic bags and bottles. Through the International Coastal Cleanup actions over the past 10 years incidence of entanglement have been reported for seabirds, seals and other marine mammals like marine turtles as well as for sharks.

It is also of deep concern that, apart from entanglement; birds, turtles and fish ingest pieces of plastic, mistaking it for food, causing injury and death. Ingestion data is obtained by examination of stomach contents of dead seabirds or through examining regurgitations. At least some beach strandings of whales have been attributed to ingested litter blocking their digestive tracts.

Does plastic floating in the sea release toxins?

Marine biologists have done a lot of experiments to show that micro plastic fragments are transported or digested like other micro debris (e.g. sand) and these experiments clearly show the potential for the transfer of chemicals from plastic particles to tissue. However toxicity requires a combination of hazard and exposure and the potential for hazard lies in the ability of plastics to absorb and transport persistent hazardous chemicals from the environment rather than chemicals originating from the plastics themselves.

Claims that plastics in the marine environment will accumulate and concentrate toxic chemicals from the surrounding sea water are based on early research on two types of plastic granules in heavily polluted Japanese coastal waters. However, plastics can absorb all kinds of chemicals (toxic or non-toxic) from their immediate environment, provided that the chemical is compatible with the plastics. The NOAA concluded in their latest report of July 2008 that "toxicology studies are necessary to investigate the possibility of uptake of toxins from plastics or other inorganic debris particles in marine ecosystems. The likelihood of ingestion is minimal due to the low mass and concentration of debris particles relative to zooplanktonorganisms." The International Workshop on Microplastics in marine debris (Tacoma, USA September 2008) concluded that, "at current levels in the open ocean, microplastics are unlikely to be an important global chemical reservoir for historically released POPS (persistent organic pollutants)."The Belgian project ÁS-Made is an attempt to better understand the consequences of toxicity in the marine environment.

What can society do about the problem of plastics getting into the sea?

The UNEP (United Nations Environmental Programme) report 'Marine Litter, a Global Challenge' has called for: integrated waste management to better address litter; raise public awareness and education; improved port waste reception facilities and stronger economic instruments and incentives.

• For individuals, education has a big role to play with beach visitors encouraged not to litter but take their waste home or put it in a bin. Sponsored litter bins are now used widely on beaches but there need to be more of these, as well as signage and warnings of fines for littering, combined with increased surveillance of beaches and more severe fines.

• In terms of the illegal dumping of rubbish from ships and leisure craft, the 1973 MARPOL Convention sought to eliminate and reduce the amount of garbage being dumped in the sea from ships. Annex V prohibits the disposal of plastics anywhere into the sea. The Annex also obliges Governments to ensure the provision of facilities at ports and terminals for the reception of garbage. By February 2009, 139 countries had ratified Annex V. The Mediterranean is a MARPOL 'special area' so from 1st May 2009 it is prohibited for ships to dispose into the sea all plastics, synthetic ropes and fishing nets and plastic garbage bags. A new Regulation 9 came into force for ships from 1st July 1998. All ships of 400 gross tonnage and above and every ship certified to carry 15 persons or more will have to carry a Garbage Management Plan and Record Book. The EUPortWasteDirective2001 required implementation of a prior notification system for ships' waste. Under new regulations to be introduced by the UK as part of the EU Directive on Port Waste Reception Facilities nearly all ships travelling to UK ports will have to notify them in advance of the waste they will be off loading. These rules also apply to leisure craft and the UK Royal Yachting Association in its Managing Waste policy states, "Put no garbage in the sea" and warns of "substantial penalties for offenders." In Germany good environmental behaviour is part of the skipper's licence examination. HELCOM, the Helsinki Convention requires all ships to deliver garbage to reception facilities before leaving port and that they should not be charged for this. In the US the cruise ship 'Royal Princess' was fined €336,000 for dumping 20 bags of garbage overboard. So stricter

regulations and fines are in place for ships, boats and ports to prevent waste being dumped in the sea. BUT it's a fair assumption that illegal dumping is still occurring at sea.

The plastics industry understands that it must focus on proper containment of its raw material to ensure that none of it gets flushed down drains into waterways, and eventually in to the sea. The British Plastics Federation has launched Operation Clean Sweep - Plastic Pellet Loss Prevention. This is a manual on best practice in ensuring zero pellet loss into the environment. The BPF is seeking a commitment from every company, from top management to shop floor employees, to use this manual on prevention, containment and cleanup of plastic materials, to ensure no escape into the environment. PlasticsEurope and national plastic associations will be rolling out this program to all 27 European member states as part of the Responsible Care program.

Can we clean up the seas of plastic waste?

In terms of cleaning up what is already in the oceans there may be a potential to collect larger floating items. The recently returned Project Kasei investigation into the composition of the North Pacific gyre is funded by international recyclers. However in the 'no man's land' of international waters global coordination is going to be essential to deal with this issue.

• In a 'Fishing for Litter' campaign in Sweden, Denmark, the Netherlands and the UK, fishermen who returned all litter caught in their nets to the shore are compensated. In 2004 the scheme collected 500 tonnes of litter from 60 boats. The Belgian government as well as OSPAR are also considering paying fishermen for the waste they catch during their fishing voyages.

• Across the world there are numerous local initiatives to regularly clean up beaches.

• Fishing communities in Massachusetts collect discarded plastic fishing gear which is picked up to provide electricity through Energy from Waste.

• In the Cote d'Azur the authorities have employed Veolia to screen and rake through the coastal waters for floating waste with a specially equipped catamaran.

Wouldn't moving to bio-degradable plastics be a solution to ocean litter?

Bio-degradable plastics may have a role to play in some applications but they are technically unsuited to meet all of our needs and may also be less sustainable in other ways (for example: pipes for water supply window frames, electric cables, etc) . Contrary to popular belief, biodegradable plastics might potentially make the problem worse. Since degradation mechanisms heavily depend on the surroundings. Articles that might bio-degrade on land will not degrade in saltwater as it is hostile to the micro-organisms normally degrading the article on land. The idea of products that will 'rot away' would also be likely to encourage more littering and irresponsible waste management behaviour by society. The answer to marine litter has to be the improved management of society's waste.

For further information on this issue of marine litter, go to:

http://www.projectkaisei.org/press.html
http://www.marinedebrissolutions.org/
http://marine-litter.gpa.unep.org
http://www.io-warnemuende.de
http://www.oceanconservancy.org
http://www.espo.be/Home.aspx
http://www.medasset.org/medas.htm
http://www.costalcleanup.org
http://www.oceanfutures.org
http://www.eucc.net
http://www.noaa.gov
http://www.ifremer.fr

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DATA SHEET

Bis-phenol A : FACT SHEET

Environmental Safety

Bis-phenol A (BPA) is an important chemical building block used primarily to make Polycarbonate plastic and Epoxy resins. The vast majority of bis-phenol A produced, greater than 99.9%, is consumed at manufacturing sites to make these and other products, and only very low levels of bis-phenol A are released to the environment. Measurements of bis-phenol A in the environment have confirmed that bis-phenol A, when detected at all, is present only at very low levels, typically less than a part per billion in surface water.

Numerous validated studies have been conducted to determine what happens to bis-phenol A in the environment and the possible environmental impacts. Comprehensive reviews of these studies conclude that bis-phenol A is not a risk to the environment.

Bis-phenol A Readily Biodegrades and is Not Persistent in the Environment

Laboratory studies, using internationally accepted guidelines from the Organization for Economic Cooperation and Development (OECD), show that bis-phenol A is readily and inherently biodegradable in water, meaning that it breaks down rapidly and does not persist in the environment. Other studies confirm that bis-phenol A degrades rapidly in actual surface waters and sediments from a wide variety of regions.

Bis-phenol A Does Not Bio accumulate

Studies have been conducted to monitor the presence of bis-phenol A in surface waters in the US, Europe and Japan. No bis-phenol A was detected in many of the samples
analyzed from each area. When bis-phenol A has been detected in streams and rivers,
typical concentrations are less than 1 microgram per liter (parts per billion). To visualize this concentration, 1 part per billion is equal to 1 drop of bis-phenol A in 40,000 gallons or 150,000 litres of water. Laboratory studies have shown that the potential for bis-phenol A to bio accumulate is well below established thresholds of concern. Based on these studies, bis-phenol A is considered by government agencies to have a low potential for bioaccumulation, meaning that it does not accumulate to any appreciable extent in organisms that come into contact with BPA.

Bis-phenol A is Not a Risk to the Environment

The toxicity of bis-phenol A has been measured in a wide variety of aquatic organisms. Based on these studies, no adverse effects on aquatic organisms are expected at concentrations of bis-phenol A in water below 10 micrograms per litre. Comparison of this "no-effect" level with typically measured values in surface waters of 0.001 to 1.0 microgram per litre indicates that aquatic ecosystems are not at risk from bis-phenol A in the environment.

For more information on bis-phenol A, please visit

http://www.bisphenol-a.org

We welcome media inquiries about bis-phenol A. Please contact:
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The water bottle your child carries and the bag you carry for shopping are made from the same material.

That's why plastic bags are not harmful.

For more information visit **www.icpeenvis.nic.in**

ICPE

REUSE • RECYCLE • RECOVER

Do not litter.
Plastics are recyclable.

Issued in public interest by Indian Centre for Plastics in the Environment.