

## REPORT

The High Court of Delhi in W.P. (C) No. 6456 of 2004 titled Vinod Kumar Jain & Ors. Vs. Union of India & Ors., vide orders dated 19.11.2007, constituted this Committee, with the directions to study the issues regarding environmental hazards including health hazards, arising out of the use of plastic bags in the city of Delhi. It was also observed that the Committee shall be free to associate with its study, any Institute or expert in the field of plastic / polymer and to elicit opinion from the Institutions like IIT, CSIR, National Chemical Laboratory, Pune, BIS and CIPET, Chennai, or any Expert or Institute which the Committee may consider necessary to consult.

After the receipt of the copy of the order on 14.12.2007 first meeting of the Committee was convened on 20.12.2007. However, the first effective meeting of the Committee could be held on 26.12.2007 only when notices were issued for 3.1.2008 to the petitioner as well as intervener. The Central Pollution Control Board as well as Delhi Pollution Control Committee were also requested to make presentations before the Committee regarding environmental / health hazards arising out use of plastic bags in

Delhi and suggest alternatives / remedial measures. After receipt of presentations from the petitioner, intervener, Central Pollution Control Board and Delhi Pollution Control Committee, oral hearings were given, which concluded on 27.2.2008.

The Committee requested Director, IIT, Delhi to nominate an Expert / Scientist on Polymer Science and Engineering to assist this committee. Vide letter dated 8.1.2008 the Director, IIT, Delhi nominated Prof. A.K. Ghosh, Head, Centre for Polymers Science and Engineering, IIT Delhi to assist this Committee. He was associated with the Committee and was requested to attend its meetings. He was kind enough to be present in some of the hearings. Prof. A.K. Ghosh gave his report vide a letter dated 17.3.2008, a copy of which is attached.

The petitioner, who was represented by Shri Arvind Shah, Advocate has strongly pleaded for a total ban on the use of plastic bags in Delhi on the ground that the plastic bags are environmental as well as health hazard. It was submitted that the plastic bags are choking drains and leading to collection of dirty water which is breeding mosquitoes. It is also submitted that the plastic bags filled with left over food at garbage dumps are eaten by grazing cattle with the result that their stomachs get

choked leading to their deaths. Referring to Delhi Degradable Plastic Bag (Manufacture, Sale and Usage) and Garbage (Control) Act, 2000 applicable to Delhi, it is submitted that although Section 3A of the Act prohibits manufacture, sale or use of plastic bags other than degradable plastic bags, no standard has been fixed regarding their degradability and there is no research even in regard to the time taken for degradation. The petitioner has quoted countries like Ireland, Germany, Singapore etc. which have imposed heavy taxes on the use of plastic bags to restrict its use. He has also referred to countries like Bangladesh and Zanzibar where plastic bags have been totally banned.

Central Pollution Control Board while highlighting issues / concerns arising out of the use of plastic bags, laminated pouches and non recyclable plastic litter in the city, has proposed that local bodies viz. MCD, NDMC, Delhi Cantonment Board should make arrangements to collect plastic waste and design appropriate recycling / processing facilities for the disposal of segregated plastic waste. It has also proposed that recycling units located in non-conforming areas should be shifted to the conforming areas.

CPCB has completed a study in collaboration with CIPET, Chennai on "Establishment and Impact of Biodegradable plastics on Environment/Food." Findings of the report are being finalized by CPCB.

It is suggested that the sale and use of sub-standard plastic bags should be checked and mass awareness programme should be launched to prevent littering of plastic bags.

D.P.C.C. while agreeing that the plastic bags waste blocks the drains and kills cattle who eat it with the garbage, has stated that plastic after its recycling, in accordance with IS:14534: 98 only is not dangerous to environment. DPCC has observed that best practices for the use and management of waste plastic bags like conversion of plastic waste into carbon nano particles, wax and utilization of plastic waste for road construction etc. may be adopted. It has emphasised that utilization of plastic waste as fuel in cement kilns or steel industry blast furnaces etc. should be adopted. It has also stated that the conversion of plastic waste into hard board which can be used for making doors, partition walls, furniture etc. is also feasible. It has suggested the alternatives of plastic like cloth bags, jute bags and paper bags and feels that the local bodies should be directed to establish

waste recovery centres in every zone so that the plastic waste is managed. It has also stated that Plastic Manufacturers' Association should be directed to exercise corporate social responsibility and set up state-of-art plastic recycling units. Public awareness is also emphasized.

The Intervener Shri O.P. Ratra has emphasized that neither plastic nor plastic bags are per-se dangerous to health or environmental hazard. He proposes effective collection of plastic bags waste and its re-use or recycling for various products, road construction material and material for power generation.

This Committee proposes to examine the following issues and find out the answers thereto: -

1. Whether plastic bags are per-se injurious to health or hazardous to environment?
2. Whether degradable/Biodegradable plastic bags are an alternative and can be introduced without any difficulty?
3. Whether bags made of other materials can substitute the plastic bags and meet the demand?
4. What are the existing laws to regulate the use of plastic bags in Delhi?

5. Whether recycling of the plastic bags waste is a health / environment hazard?
6. What are the major health or environmental hazards arising out of the use of plastic bags?
7. What steps can be taken to check the health and environment hazards arising out of use of plastic bags in Delhi?

After hearing the parties, examining the material on record, existing statutes on the subject and the ground realities, this Committee finds as under:-

1. Whether plastic bags are per-se injurious to health or hazardous to environment?

Upon consideration of the submissions made by the parties, material placed on record and the report submitted by Prof. A.K. Ghosh of IIT, Delhi, this Committee is of the considered view that finished virgin plastic products are not injurious to health. Plastic is a chemically inert substance and does not pose any health hazard. Plastic is used worldwide for packaging of medicines, life saving drugs, childcare products and a wide range of personal care products.

Plastic bags are used for packing as well as carrying various products. Plastic bags are required to conform to various standards if used for packing food. Recycled/coloured plastic bags contain certain chemical additives which are injurious to health and may leach to the ground and contaminate soil as well as sub-soil water. Therefore, it can be concluded that virgin plastic bags are not per-se injurious to health or hazardous to environment but recycled/ coloured bags are. It can therefore be concluded that a blanket ban on use of plastic bags is not called for.

2. Whether degradable/Biodegradable plastic bags are an alternative and can be introduced without any difficulty?

Degradable plastics are those which undergo significant changes in their chemical structure in specific environmental conditions. They are broadly categorized as under: -

- i) **Biodegradable Plastics:** A degradable plastic in which the degradation results from the action of naturally occurring micro organisms such as bacteria, fungi and algae leading to significant changes in the chemical structure;
- ii) **Photo-biodegradable:** A degradable plastic in which the degradation results from the action of natural daylight.

- iii) Thermal Degradable Plastic: A degradable plastic in which the degradation results from the action of heat.
- iv) Compostable Plastic: A plastic that undergoes degradation by biological processes during composting to yield carbon dioxide, water, inorganic compounds and biomass, compostable materials and leaves no disintegrable or toxic residue.

The information collected by Central Pollution Control Board indicates that the cost of biodegradable plastic is 4 to 7 times higher than non-degradable plastic and as such most of the plastic bag manufacturers are using non-degradable plastics. It is also to be added that even biodegradable plastics are in its nascent stage and research work is on for the development of appropriate types of biodegradable plastics. Bureau of Indian Standards is reported to be preparing Indian standards on specification of degradable plastics including biodegradable plastics. It appears that the authorities have not been able to define and prescribe standards for the degradable and biodegradable plastics in India. In the course of discussions, this Committee also found that there was an International trend to discourage use of Oxo or photo degradable plastics for the reason

that these have their own harmful effects due to fragment / break down contents of the additives based degradable materials.

Therefore, it cannot be said that degradable plastics pose no health or environmental hazard. These do not decompose naturally on account of action of microorganism. Mere disintegration of molecular structure cannot be taken as degradation. Biodegradable plastics however, are made of natural substances and decompose through microbial action. Therefore biodegradable plastics should be encouraged for manufacture/use of plastic bags.

3. Whether bags made of other materials can substitute the plastic bags and meet the demand in Delhi?

Before delving into this issue, this Committee would like to make it clear that plastic bags are quite an economical and convenient mode of carrying various articles / commodities. Considering the high demand of carry bags in the city of Delhi and the types of articles carried by the consumers from the point of purchase to the point of user, alternatives like paper bags, jute bags or the bags made of cloth are only a limited alternative and can be a supplement to biodegradable plastic bags so that the use

of plastic bags gets reduced. Problems arising on account of waste generated by plastic bags can get reduced to a great extent if bags made of paper, jute or cotton are also popularised and put to use by people.

If paper bags alone are mandated as a substitute these would have the difficulty of holding weight or wet articles. Paper production also involves green house gas emissions and consumes abundant water as well as energy in the manufacturing process. If paper bags are introduced as an alternative to plastic bags, it would ultimately result in manufacturing of more paper resulting in cutting of more trees for manufacturing paper and consequently disturbing the ecological balance.

Jute bags appear to be environment friendly but the production of jute also needs a lot of water and creates pollution during retting process. Jute bags can therefore be a viable supplement for heavier goods with the advantage of repeated reuse, thereby curtailing the use of plastic bags substantially.

Cotton bags are also a good alternative and may be encouraged to be used and reused for daily and regular shoppings.

Thus, this Committee is of the considered view that plastic bags which are economical, efficient and a popular mode in use by the citizens of Delhi cannot be withdrawn/banned completely but other alternatives can be encouraged and propagated which may result in reducing the demand/use of plastic bags. The chaos and problems created by the use of plastic bags in the city of Delhi are primarily on account of waste generated by plastic bags which needs efficient handling by the authorities as well as Plastic Manufacturers Association.

4. What are the existing laws to regulate the use of plastic bags in Delhi?

The Plastic Manufacture, Sale and Usage Rules, 1999 as amended in 2003 prohibit the use of recycled plastic bags for storing, carrying, dispensing or packaging foodstuff. Coloured recycled bags contain some metallic additives which have harmful affects and leach and contaminate soil as well as sub-soil water. Multi layered and metalized pouches used for Gutkha and Pan

Masala are not recyclable at all due to their composition and as such they remain as solid waste indefinitely causing serious damage to the environment.

The aforesaid Act also provides that virgin as well as recycled plastic bags should not be of thickness less than 20 microns and of the size less than 8" x 12". It also prescribes colourants and pigments for recycled plastic bags. These rules prescribe that recycling of plastics shall be in accordance with IS:14534:1998. It also prescribes that all manufacturers of plastic bags shall be registered. These provisions do not appear to be followed by the manufacturers as well as suppliers of plastic bags and as such an effective and vigorous campaign is required for enforcing these provisions. It would reduce the menace of non recyclable plastic waste polluting the earth, subsoil water and atmosphere.

In case the thickness of plastic bags is increased to 40 microns in Delhi also, as has been done in some other States, the inflow of the plastic bags waste into solid waste would get substantially reduced as the rag pickers would be keen to segregate the same for recycling purposes.

Section 3 (A) of Delhi Degradable Plastic Bag (Manufacture, Sale and Usage) and Garbage (Control) Act 2000 as amended in 2005 and notifications thereunder prohibit the use of plastic bags other than degradable plastic bags in 4/5 Star Hotels, Hospitals with 100 beds or more, Restaurants with 100 or more seating capacity, Mother Dairy outlets, liquor vends and shopping malls but this provision does not appear to be effectively enforced. The ban imposed on hotels, hospitals, malls etc. takes care of a small percentage of plastic bags only in as much as maximum consumption thereof is through the main markets, local shopping centres, small shopkeepers and street vendors.

5. Whether recycling of the plastic bags waste is a health / environment hazard?

Recycling of plastic, if carried out as per approved procedures and guidelines, may not be environmental or health hazard but in case it is carried out, and in fact it is being carried out in Delhi, in unlicensed units in non-conforming areas, it results in emission of toxic gases which are a health hazard. According to Plastic Manufacture, Sale and Usage Rules, 1999 as

amended in 2003, the recycling of plastic waste is required to be undertaken by registered units only. In Delhi however there are fairly large number of unauthorised recycling units in operation in non conforming areas using crude methods which are health / environmental hazard. Unlicensed recycling units operating from non-conforming areas are using various methods of heating plastic bags waste, which emit toxic gases posing a serious environmental/ health hazard. The doctrine of sustainable development heavily leans on precautionary principles and as such it is the duty of the State to ensure that such unauthorized units are immediately shut down or are made to shift to conforming areas where they are duly licensed and recycle the plastic waste as per guidelines with the help of modern plants and machinery. This Committee, therefore, has no hesitation in holding that unsound recycling practices are a serious health / environmental hazard. Those who violate the provisions / norms should be dealt with very strictly as per law.

6. What are the major health or environmental hazards created by the use of plastic bags?

It is a ground reality that used plastic bags find their way into garbage dumps and go into the drains and nallahs choking the drainage system. Some of the plastic bags which contain left over food or which get mixed up with other garbage are eaten by

cows and other animals resulting in their deaths. Therefore, it can be said that indiscriminate littering of used plastic bags and their mingling with solid waste poses a serious health and environment hazard. Thick plastics are seldom left in the solid waste for the reason that such plastic waste is picked up by the rag pickers for monetary reasons but thin plastic bags which have little or no value and whose segregation is difficult also find their way into the drains, nallahs and landfills along with solid waste and result in environmental as well as health hazard.

The Govt. has already prohibited the Manufacture, Use and Sale of plastic bags of less than 20 micron thickness and less than 8" x 12" in size. Some of the States have increased the thickness Rule of the plastic carry bags to the higher limit of 40, 50 or 70 microns. In Delhi, however, it continues to be 20 microns. If the thickness of the plastic carry bags is increased, it would improve the situation immediately to a great extent for two reasons. Firstly, the plastic carry bags would become more costly and as such indiscriminate use of plastic bags for carrying anything and everything will stop. Even a pack of tea or sugar or a strip of medicinal tablets, which can be easily carried by hand, are put by the sellers in plastic bags as the cost of thin plastic

bags is very low. If the cost goes up, the tendency would be to avoid using plastic bags for such unnecessary items. Secondly, because of higher thickness, used plastic bags would be monetarily more attractive for the rag pickers for recycling and easy to pick also from the dumping sites, resulting in its curtailment from going into drains or lying at landfills for a long period.

This Committee, is of the view that if virgin plastic bags only, which are translucent and of more than 40 microns thickness are used for carry bags, most of the health hazards arising out of use thereof and waste management shall be taken care, of for the reason that these have no harmful additives and would be readily collected by rag pickers for recycling because of their value.

7. What steps can be taken to check the health and environment hazards arising out of use of plastic bags in Delhi?

**Recommendations of the Committee: -**

- i) Thickness of the plastic bags for manufacture, sale and use in Delhi may be increased to 40 microns, as has been done in some other States, so that the plastic bags are more costly and its indiscriminate use by the vendors of

various products is discouraged. It would also improve retrieval and recycling of the waste of such plastic bags as rag pickers would find it more remunerative as well as convenient to pick up waste of such bags.

- ii) Manufacture and use of biodegradable plastic bags may be given wide encouragement as their waste is consumed by micro-organisms. Such plastics are costly but Govt. may introduce incentives and tax/duty concessions to make these plastics affordable and an economically viable option for plastic bags manufacturers. Such indirect tax benefits may be provided separately on capital investments, raw materials and finished products for promoting biodegradable products.
- iii) MCD, NDMC and Delhi Cantonment Board which handle and manage the solid waste/garbage in the city of Delhi may be directed to encourage and support proper agencies for removal of plastic waste and if possible in every zonal office/Dhalao they should set up a plastic compaction unit where rag pickers/agencies may bring the plastic bags waste and get it compacted for sale to the

recyclers of plastic waste. Committee has been informed that such compaction machines are being manufactured in Delhi and one of such machines has been found working satisfactorily at Sreekot, Shrinagar, Pauri Garhwal.

Along with compaction units buy-back facilities can also be provided either by private entrepreneurs or by the State so that after compaction of plastic waste, the plastic waste may be sold there itself. Reasonable rates may be fixed for the plastic waste to encourage the rag pickers and others to collect and sell plastic bags waste. If this proposal is implemented even the domestic help may be prompted to segregate, store and then sell plastic bags waste at such centres, to earn some money.

- iv) Recycling of plastic waste should be regulated effectively so that there are no recycling units in non-conforming areas. Strict action should be taken against unlicensed recycling units. Supreme Court directions should be complied with to shut down recycling units in non-conforming areas. DPCC must be provided adequate staff

and powers for curbing this menace. The DPCC officers should have the powers of search, seizure as well as confiscation of plastic bags which are found to be in violation of the rules. They should also be empowered to search, seize and confiscate machines/material found for manufacturing plastic bags in violation of the rules or for recycling of plastic waste in unlicensed units.

- v) Environmentally sound and economically viable modern recycling units must be established by licensed plastic bags manufacturers or Plastic Manufacturers Associations on the basis of polluter pay principle. Directions may be issued by the Court in this regard.
- vi) Discouraging use of recycled plastic bags and encouraging usage of virgin plastic/biodegradable bags may also help. Coloured bags contain metallic additives which are injurious to health as well as the environment should be banned totally. Multilayered and metalized pouches also be banned totally.

- vii) The used/discarded plastic bags/packaging material should be encouraged for other segments like manufacturing of plastic furniture, non-critical household products like dustbins, mats, cloths hangers etc. It should be used in construction of roads since it blends with bitumen and has given encouraging results as pointed out by Shriram Institute of Industrial Research and CPCB.

The waste generated by plastic bags can also be used for making various items of daily use and handicraft items. It can also be used for manufacturing doors and windows. It can be used as partial fuel in cement kilns and blast furnaces of steel plants. Even railway sleepers can be manufactured by this waste.

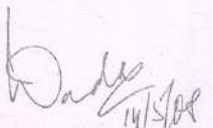
- viii) Plastic waste can also be used for generating power. This option may be addressed on priority for generating power through solid waste including plastic waste as is being experimented by local bodies in Delhi.

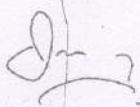
- ix) The proposal with DPCC for use of plastic waste for making nano particles be examined on priority basis. The experiment being carried out in Rajkot, Gujarat by M/s. Hanger Bio Engineers Pvt. Ltd. regarding segregation of plastic waste from solid waste and its use for power generation requires a closer examination and adoption if found feasible. In Delhi such projects are the need of the hour.
- x) The major contributors / generators of plastic bags waste like malls, airports, railways, fast food centres etc. should be asked to make arrangements for plastic waste collection. They should be made fully accountable for delivery of plastic bags waste to authorized recycling units. They may also be directed to use only bags made of biodegradable plastics.
- xi) Alternatives to bags of less than 8" x 12" made of paper/jute cloth should also be encouraged so that at least small sized plastic bags are not used. Paper, especially recycled paper, is an option for such smaller bags so that small size plastic bags do not form part of

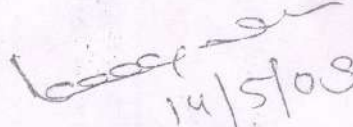
solid waste in Delhi. Bags made of recycled paper, jute or cotton may not totally replace plastic bags but their use in addition to plastic bags by vendors shopkeepers for certain items would solve the waste problem to a large extent.

- xii) Public awareness campaigns may be intensified so that the citizens also appreciate the health and environmental issues arising out of the use of plastic bags. They may be educated and motivated to adopt alternatives for making their daily purchases and avoid accepting plastic bags for each and every item. They be also motivated to store and dispose plastic waste separately.

Submitted for the kind consideration of Their Lordships.

  
(Shri J.K. Dadoo)  
Chairman  
Delhi Pollution  
Control Committee

  
(Shri J. M. Mauskar)  
Chairman  
Central Pollution  
Control Board

  
(Justice R.C. Chopra (Retd.))  
Former Judge  
Delhi High Court