

INVOLVEMENT OF INFORMAL SECTOR IN PLASTIC AND PAPER RECYCLING IN PAKISTAN

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ABSTRACT

The estimated figures of plastic and paper wastes generation across the country is about 1.32 million tonnes and 0.51 million tonnes per annum respectively. In Pakistan the history of informal sector is as old as recycling itself. The main reason for the development of informal sector is increase in demand for plastic and paper products, more market of recycled products and economically viable recycling process. In Pakistan recycling is not for the sake of reduction of the pollution and landfills over utilization but is the result of economic return from it. The waste management system is unable to adequately deal with the increasing burden of plastic and paper wastes despite the substantial collection by scavengers. These problems highlight the urgent need for the establishment of organized recycling system in Pakistan supported by strict legislation. This paper briefly addressed the issues and trends in the plastic and paper recycling industry, conclusion and recommendations. Various stages of collection, sorting, processing, disposal and reuse of plastic and paper wastes will be shown through photographs in the poster session.

INTRODUCTION

Recycling may generally be considered as a key strategy for alleviating the pressures of society on the environment. A variety of environmental justifications for recycling exist: recycling processes reduce demand for energy and finite resources, result in less water pollution and air emissions and mitigate the problem of solid waste disposal. In particular, recycling paper reduces the pressure on natural resources such as forests. Moreover, recycling may be considered economically beneficial in developing countries. First, it provides significant employment opportunities to a large informal sector. The high degree of labour intensity of certain reclamation processes enables numerous people to accrue some kind of income. Second, recycling can reduce the costs for raw materials in the production process and thereby may result in an increase in the supply of cheaper products. Third, it can reduce dependence on foreign resources and thereby saves on expenditure on imports in developing countries. Finally, in Asia particularly, the anticipated high growth in GDP will significantly increase the waste disposal burden in most metropolitan areas. Besides generating negative impacts on the environment, the increasing economic costs of solid waste disposal will absorb a substantial amount of the municipal budget. Recycling will reduce the quantity of solid waste.

PLASTIC WASTE RECYCLING

Plastic of one kind or another now pervades everyday life more thoroughly than almost any other material. Plastic goods have found wide application in various sectors such as industry, agriculture, construction, health care, packaging and household necessities. From 1990 onward the use of plastic goods has increased manifold. Increase in per head income, strong substitution effect of plastics, less energy consumption and low cost linked with production of plastics are some of the reasons linked with increasing trends of plastic consumption. Their energy and resource cost is high. Management of plastic wastes is one of the great challenges of Pakistan. In general, the term recycling is used for all activities related to reclamation of waste. Municipal solid waste is primarily composed of vegetables, and organic matter paper, glass, metals and plastics. Although there is no adequate regulations for recycling, yet the informal sector is engaged in waste collection for the reasons that:

- i) The people engaged in this business earn money.
- ii) People get self-employed.
- iii) Recovery of recyclable products.
- iv) No huge investment involved.

Recovery and recycling of plastic in Pakistan is mainly a market driven phenomenon with a comprehensive domestic trade market system. Recycling of plastics in Pakistan primarily depends on hundreds of thousands of scavengers or pickers who pick at garbage bags, on the curb or in the dumps. This situation is no model for managing waste and is often unhygienic but is itself a result of the lack of formal treatment and disposal facilities in the country. The recycling activities are expanding and developing rapidly without any government support. In contrast, recovery in the industrialised world is mainly environmentally motivated and public participation and government's involvement play a much more important role (Beukering 1994).

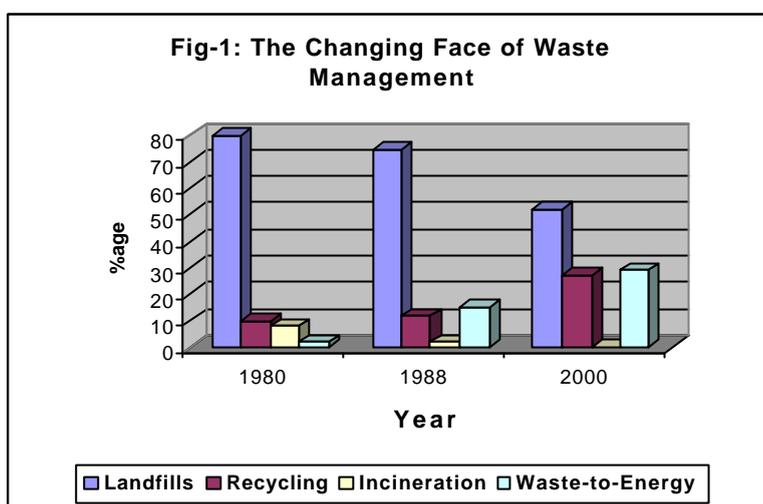
PLASTIC AND WASTE PAPER RECYCLING

In a broad sense, recycling includes both reuse and reclamation. Initially recycling was considered as an alternative solid-waste management technique and concentrated on diversion of wastepaper from landfills. There was an explosive growth in recycling world wide because of rising social and environmental concerns. This resulted in an effective infrastructure for waste collection at least in the developed countries. Today, recycling has emerged as a serious concern as the quantity of recyclable has increased considerably over the years.

Recycling infrastructure is facing a problem of effective handling of collected waste. Some recycling units have rapidly expanded their operations and invested in new technologies to handle the influx of material. The importance of wastepaper as a secondary raw material has been realised. The recycling industry is developing rapidly as material generated by it is much more economical and environment-friendly. These advantages may result in an increase in the trade of recyclable paper.

In future, recycling markets are expected to grow substantially as a result of public participation and economic, social and environmental concerns. Green Peace movements in most of the developed countries especially in Germany, the EU and

Japan will have an impact on recycling. Use of wastepaper will increase and virgin pulp is expected to play a declining role in the 21st century. A 15 year outlook published by the Resource Information system Inc., USA has projected that by 2009, recovered paper is expected to account for 42 percent of the world's furnish mix compared to 32 percent in 1993 (RPN, 1994c). Waterpaper recovery rate for almost all countries of the world is increasing which would change the pattern of waste management, and recycling might play an important role as shown in Figure-1.



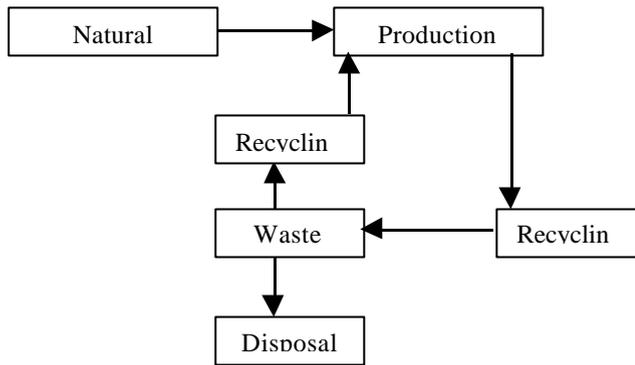
The plastic waste stream emerges from three main sources: agriculture, industrial and municipal solid waste, which account for 63, 16 and 21 percent respectively (Beukering, 1997). This ratio may be slightly different for Pakistan, but it is felt that the trend would be the same. The composition of municipal solid waste varies greatly from city to city. Table-1 gives plastic and paper waste generation in different cities of Pakistan. The estimated figure of plastic waste generation across the country is 1.240 million tonnes per annum.

Table-1: Plastic and Paper Waste Generation in Different Cities of Pakistan

Sr. No.	Cities	No. of Scavenges	Plastic Waste (Tons)		Paper Waste (Tons)	
			Per Day	Per Year	Per Day	Per Year
1.	Faisalabad	1500	44.4	13320	19.4	5820
2.	Gujranwala	1200	41.2	12360	20.6	6180
3.	Karachi	7000	412.8	123840	264.5	79350
4.	Hyderabad	1200	35.1	10530	23.4	7220
5.	Peshawar	800	29.9	8970	17.0	5100
6.	Quetta	600	31.0	9300	27.9	2490

As a proportion of total municipal waste stream, the share of plastic is more or less equal to the figure of some developed countries (Fig-2). However, it is important to note that the ratio of plastic in municipal solid waste decrease to less than 1% as the informal collectors pick up plastic, paper and metallic waste to sell them for their economic returns.

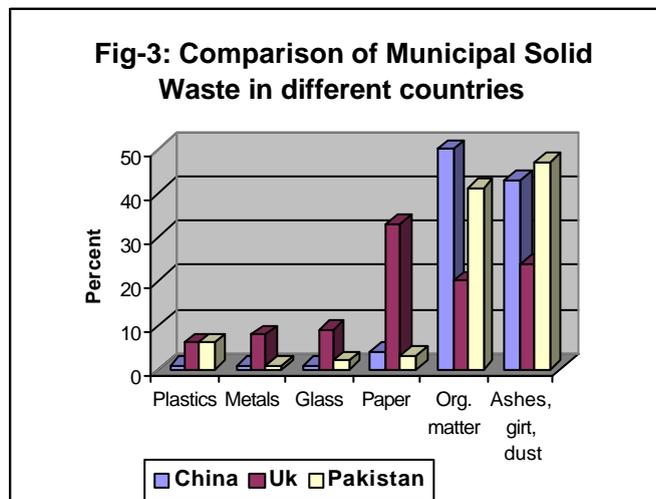
Figure-2: **Recycling reduces resource consumption and waste generation**



INFORMAL SECTOR AND RECYCLING OF PLASTIC AND PAPER WASTE

In all communities it has always been common practice to recover valuable materials from waste, such as plastic and metals. Recycling is often based on a simple principle: waste should be treated as a resource, thus reducing demand for natural resources and the amount of waste required for final disposal (Fig-3).

In Pakistan, municipal authorities collect only mixed waste. There is no concept of waste separation, and toxic and hazardous waste finds its way into the collected municipal waste. Sanitary landfill is not practiced and waste is thrown on open and uncontrolled dumping sites. Due to either absence of stringent laws and regulations or non-compliance, thereof waste is often dumped in unauthorized areas. A study conducted showed that the percentage of paper in municipal solid waste was 4.89, 3.18, 6.29 and 7.85 in Karachi, Lahore, Faisalabad and Rawalpindi respectively. More recent data (1984-85) indicated that paper content in solid waste in Karachi was 5.25% (MEIP, 1994). These figures are much lower than those for most of the developed countries as shown earlier. There are two reasons for this. First, overall consumption of paper in Pakistan is significantly lower. For example, in 1992 per capita consumption of P&B in Pakistan was only 2.7 kg as compared to 304.0 kg for the US, 227.5 for Japan and 204.0 kg for Canada (PPI, 1991 and 1993). Secondly, there is a substantial manual scavenging by rag pickers scavengers before waste is disposed of.



Recycling plays a vital role in protecting the environment and in providing the employment. Plastics are recovered by scavengers from waste streams for recycling. However, because of the informal activity it is not easy to assess the actual number of people involved in it. Table-1 indicates rough estimates of the number of scavengers, amount of plastic and paper waste collected and the income generated from their recovery. It is universally undesirable both environmentally and economically to send plastics can be successfully recycled. A number of factors make recycling of plastics relatively difficult. These are:

- i) Bulky nature of plastic wastes make their transportation difficult and expensive.
- ii) Plastic wastes are mixed with other wastes and their separation being a problem.
- iii) Different plastic polymers, with diverse physical and chemical characteristics, are often mixed.

The informal sector consists of self employed individual collectors or scavengers who are often Afghan children. According to rough estimates about 90,000 scavengers are involved in this sector in Pakistan. The informal sector is able to operate profitably because it uses an efficient house-to-house collection method within local districts, thus limiting transport costs. The scavengers sell recyclable materials for economic returns. Under the present system, the municipalities are not carrying out any type of recycling activity. Normally, the main recyclable items like plastic, paper, glass and metals are retained by the people themselves, which are later on sold to street hawkers/waste dealers for recycling. In the second stage the recycleables are picked up by municipal sanitary workers who make door to door collection. Whereas the recycleables mixed with discarded waste are picked up by the scavengers. As a routine the Afghan children in the age group of 10-25 make 2 to 3 trips of garbage dumps everyday and earn Rs 100 to 200/per days.

The plastic is one of the useful items in the solid waste and is used to make plastic pellets for recycling. These pellets are used up for the manufacture of toys, household items and the things for use in industrial activities. Plastic are becoming increasingly important in various industrial sectors. Major industrial sectors using virgin and recycled plastic in Pakistan are textile, construction, machinery and electrical goods. Household plastics, comprising PVC, PP, PE, and PET, are mainly used in packaging and utensils. PET is generally used for making mineral water and soft drink bottles, which are easy to recover. One other use of plastics is shopping bags, which is posing major threat to the environment today in Pakistan. Thus plastics for household use constitute the principal source of waste plastics in the country as well as the main input for recycling industry.

A thriving recycling industry has taken roots at the non-formal level, which is responsible for collecting and then recycling of about 30 - 40 percent of the plastic waste generated in the country. The products made from recyclable plastics can roughly be divided into two categories. One is made by the mixture of virgin and secondary material, with the later constituting less than 20 percent to ensure appropriate quality of en-product. Finished products of this kind are largely those used in household such as buckets, tubs, furniture and goods for industrial use. The other kind of secondary products are made totally from recyclable material with no virgin material added.

Finished products of this kind include low-price toys low-grade household utensils, soles for shoes, plastic bags. These of secondary plastics will expand with the advancement of processing technology.

CONCLUSION

An invaluable contribution is being made by the informal sector in the overall management of solid waste in Pakistan. Plastic and other recycleables mixed with municipal solid waste are being informally collected by scavengers. A large number of people are involved in this recycling activity from collection of plastic wastes to manufacture of a useful product. This activity not only employs a sizeable number of people but also has great environmental significance. The governmental authorities should formalise the entire process through registration of scavengers in the major cities. It is also felt imperative that community based NGOs should get involved in recycling activities with the help of local people. Establishment of small and medium enterprises using wastes as raw materials should be encouraged through tax incentives, credit loans, import facilities and provision of infrastructural facilities.

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