CHAPTER - II

REVIEW OF LITERATURE

CHAPTER - II

REVIEW OF LITERATURE

The literature and reports of researches relevant to the present investigation are presented in this chapter under the following heads :

1. Buyer Behaviour.
2. Consumption and Conservation of Resources.
3. Solid Waste : Classification, Quantity and Disposal.
4. Environmental Concern in Individuals.
5. Environmental Concern in Marketing : Its Changing Social/Environmental Role.
6. Eco-Labelling.
7. Conclusion.

1. Buyer Behaviour

Buyer behaviour or consumer behaviour, as some call it, is a comparatively new field of study. It is an attempt to understand and predict human actions in the buying role as a consumer. "Consumer behaviour" is defined by Runyon (1980, p.48) as "that behaviour exhibited by people in planning, purchasing and using economic goods and services". Frequently, the term "buyer behaviour" is also used to describe this process. But Runyoun (1980) draws a distinction between the two. He opines that buying behaviour focuses on the behaviour of the particular individual who purchases the product, if that person is not involved in

either planning the purchase or using it. Such as an individual who is requested to purchase a product that will be consumed by another member of the family. Hence, he recommends and prefers to use the term consumer behaviour which includes those "who may be consuming units, eventhough they did not actively participate in the buying activity". It is used to encompass the entire decision-making/buying/ consuming process regardless of who is involved.

> Buyer behaviour is defined by Sherlekar (1986, p.72) as
>
> all psychological, social and physical behaviour of potential customers as they become aware of, evaluate, purchase, consume and tell others about product.... It includes communication, purchasing and consumption behaviour.

He considers actual purchase as only one part of the decision process that precede and determine the acts of individual who obtains and uses economic goods and services. The terms "buyer behaviour" and "consumer behaviour" are used interchangeably. They cover the entire decision making, buying, consuming process, regardless of how many individuals are involved.

Viewing these, the terms "consumer behaviour" and "buyer behaviour" were used interchangeably in the present investigation also.

1.1 Types of Buying Behaviour

Consumer decision making varies with the type of buying decision. There are various products in the market ranging from a simple tooth brush to a car. The more complex and

expensive decisions are likely to involve more buyer deliberation and more buying participants. Kotler (1988) distinguished four types of consumer buying behaviour based on the degrees of buyer involvement in the purchase and the degree of differences among brands.

1.1.1 Complex buying behaviour: This occurs when consumers are highly involved in a purchase and are aware of significant differences existing among brands. Consumers high involvement in purchase occurs in expensive or rare purchases. for that product which is expensive, bought infrequently, risky and highly self-expressive. Here the buyer will pass through a cognitive learning process characterized by first developing belief about the product, then attitude followed by making a thoughtful purchase choice.

1.1.2 Dissonance - reducing buying behaviour : Sometimes, in the purchase of products which are expensive, infrequent and risky, the consumers are highly involved in a purchase but see little difference in brands. The buyer would shop around to learn what is available but will buy fairly quickly because brand differences are not pronounced. After the purchase the consumer might experience post-purchase dissonance because of some reasons. Then he/she starts learning more facts and seeks to justify his/her decision to reduce the dissonance.

1.1.3 Habitual buying behaviour : Many products are bought under conditions of low consumer involvement and the absence of significant brand differences. The consumer behaviour in these cases does not pass through the normal belief/attitude/ behaviour sequence. It would be Brand belief formed by passive learning, followed by purchase behaviour, which may/may not be followed by evaluation. Consumers do not really form an attitude towards a brand but select it simply because it is familiar.

1.1.4 Variety seeking behaviour : In some buying situations, there is low consumer involvement but significant brand differences. The consumers generally do a lot of brand switching for the sake of variety rather than due to any dissatisfaction.

1.2 Stages in the Buying Decision Process

In the complex buying behaviour, the buyer goes through a decision process which is considered as "Five-stage model of the Buying Process" (Kotler, 1988), consisting of problem recognition, information search, evaluation of alternatives, purchase decision and post purchase behaviour. It is emphasized that the buying process starts long before the actual purchase and has consequences long after the purchase.

1.3 Understanding Consumer Behaviour : Major Influential Variables

The consumer behaviour is complex as there are various invisible factors acting at the same time on the buying-consuming process. Various researchers have tried to explain the relationship of different variables with consumer behaviour through development of models. Generally they have explained buyer behaviour as "stimulus-response" behaviour or input-out model.

There are various stimuli (input) from which the buyer selects, to which, he/she responds (behaviour). According to Kotler (1988) the stimuli are of two types. Marketing stimuli consist of the Four P's : product, price, place and promotion. Environmental stimuli consist of major forces and events in the buyer's macro-environment : economic, technological, political and cultural. All of these stimuli pass through the buyer's "black box" and produce the buyer's purchase decisions : product choice, brand choice, dealer choice, purchase timing and purchase amount.

Buyer's purchase decisions are highly influenced by the buyer's unique set of cultural, social, personal and psychological factors.

(a) Cultural Factors : The culture, sub-culture (religious groups, racial groups, nationality groups) and social class exert the broadest and the deepest influence on consumer behaviour.

(b) Social Factors : Reference group, family, roles and status also influence consumer behaviour. The Family is the most important consumer buying organization in society and constitutes the most influential primary reference groups shaping a buyer's behaviour. In the purchase of large variety of goods and services the family members can assume the roles of the initiator, influencer, decider, buyer and user, depending upon the product.

(c) Personal Factors : A buyer's decisions are also influenced by his/her personal characteristics, notably, the buyer's age, occupation, economic circumstances (income/ credits) lifestyle, personality and self-concept and the stage of family life cycle.

(d) Psychological Factors : A person's buying choices are also influenced by four major psychological factors. They are - motivation, perception, learning beliefs and attitudes.

Runyon (1980) also opines that the individual (consumer) has certain needs and goals, and a history of past experiences, which have been internalized in the present personality structure of the individual. In addition, the person has hopes, expectations and fears. Thus, the past present and future exist simultaneously as forces influencing behaviour. The person acts in the context of his/her environment and which exerts forces that act upon him. These are physical, social and economic in nature.

Sherlekar (1986) emphasizes that consumer purchase decisions are influenced by various internal factors such as perception, attitude, learning, awareness and so on. The factors external to the individual are social, economic, cultural, familial and business influences.

1.4 Studies Concerned to with Consumer Behaviour

Some researches could be identified that study variables influencing and predicting buying behaviour. Fishbein (1966); Tuck (1793); Hanell and Bennett (1974) Douglas (1975) suggested that attitude towards a particular work/activity, role preference and role behaviour are better predictor of the buying behaviour.

Xavier (1991) after studying perceptual, motivational and personality variables as predictors of product purchase behaviour revealed that Likelihood measure (of purchase) tended to be a better measure in predicting the purchase of the various products under study than the Frequency (of purchase) measure.

Sweety (1979) concluded that the two selected groups based on residential area/city differed significantly with respect to the type of product attributes that were considered. Some emphasized physical attribute of the product whereas some emphasized economic aspect based on the product type.

Roberts and Wortzel (1979) concluded that food preparation styles contribute more to an explanation of general shopping patterns than role orientation. Their study found that neither employment status nor career orientations had much effect on food shopping behaviour.

Bawa and Shoemaker (1983) conducted a survey on the effect of a "Direct Mail Coupon" on brand choice behaviour and revealed positive effect of reduced `price' on buying. The coupons did produce a short-term increase in the brand's purchase among users as well as non-users.

Agarwal (1983) found that in case of rising price of Oil, Ghee and Butter, majority of the households did not stop the consumption of product, though some reduced the quantity of consumption and some substituted the products.

Ferber and Lee (1974) found that the person (husband or wife or both) holding the "Family Finance Officer" (FFO) role affects the form of savings and the major types of purchases. The decisions regarding buying various products in the households are generally either taken by the husband or the wife alone, or jointly. Agarwal (1983) revealed that in little more than half of the families the major buying decisions were taken by husbands and in rest of the families the decisions were taken either by wives or jointly by husband, wife and children.

Gifts are also one of the important purchases of the households. In an exploration of consumer choice and choice

process in gift selection, Horne (1993) found the impact of internal constraints such as motivation and recipient knowledge on both choice and choice processing Motivation was found to directly affect the gift relevant information recalled and considered. Recipient knowledge on the other hand was found to be directly related to information recalled and inversely related to information considered.

Agarwal (1983) found demographic factors such as age and income affecting the quality of buying practices. She found that older consumers were better buyers and richer consumers were careless buyers.

Thus, on the whole, it was observed that various personality variables, motivational variables, product attributes, attitudes, life-style, price and the demographic variables influenced buying behaviour by and large.

A special mention needs to be made about the analysis of types of consumer done by Stampfl (1978). According to him there are (1) Industrial-age consumer (2) Transitional consumers, and (3) Post Industrial consumer. Characterizing each, he said, Industrial age consumers reached their adulthood between 1920 and 1960 and stressed ownership of material possessions, had underlying philosophy of "more is better" because resources were thought to be unlimited. They think little of the impact of their own consumption on society or environment. The transitional consumers reached adulthood between 1960 and 1990. They find old values in

conflict with societal imperatives and have ambivalent feelings regarding the proper consumption decisions. They are torn between the wants stimulated by industrial-age marketing mechanisms and the "oughts" supportive of societal/environmental concerns. He projected that post Industrial age consumer would reach adulthood after 1990. Their primary concern will be with efficient, thoughtful and responsible consumption and will insist upon buying only those products supportive of the ecosystem in which they live. Disposable packaging, industrial pollution of lakes and rivers, cars consuming more fuel will be considered inappropriate by them. They will consume only as much as they need as this would be economic and environmentally sensible.

Regarding values for disposability vs. recycling, he analysed that, industrial age consumers use no-return beverage containers, disposable diapers, throw-away cans and plastic and paper packaging. The post industrial-age consumer, on the other hand will regard recycling as normal behaviour and waste creation as abnormal. They would be fully aware of social and environmental costs of production and consumption and consider themselves as part of nature and not its master.

As this was projected in 1978, there is a need to examine the consumption behaviour and underlying values in the post-industrial consumer maturing after 1990, in the

present perspective. The present investigation was an attempt to find out environmental concern of homemakers of "post-industrial age", in Stampfl's terms.

1.5 Sources of Information

"Information Search" is one of the stages of "Five Stage Model of Buying Process" (Kotler, 1988). After recognizing the problem/need, the consumer may undertake no search or some search or very active search for information bearing on the need.

The consumer Information Sources fall in to four groups (Kotler, 1988; Sherlekar, 1986).

1.	Personal Sources	:	Family, friends, neighbours, acquaintances.
2.	Commercial Sources	:	Advertising, sales person, dealers, packaging, displays, sales promotion.
3.	Public Sources	:	Mass media (like radio, tele-vision, newspaper), Consumer rating organization.
4.	Experiential Sources:		Handling, examining, using the product.

According to the product category and the buyer's characteristics, the relative amount and influence of these information sources would vary. Generally, the consumer receives the maximum information exposures about a product

from commercial sources but the most effective exposure comes from personal sources (Kotler, 1988). Commercial sources normally perform an informing function whereas the personal sources perform a legitimizing and/or evaluation function. Thus, each type of source may perform somewhat different function in influencing the buying decision.

Agarwal (1983) found 77% of respondents sought information before going for shopping, because people can not know anything first-hand for themselves, so they must, in practice, depend on the knowledge of others ("Second hand knowledge"). People are influenced in their decisions by peers, friends, family, acquaintances (Benider, 1991). The personal sources (word of mouth) or the information given by friends, family members was the most common way of obtaining information as found by O'Brien (1971); Day et al (1979); Agarwal (1983) and Judd (1993).

Advertisements were referred to always by about one-fifth of respondents in Agarwal's study. O'Berin (1971) interestingly found that informative advertising had no direct influence on ultimate purchase for the product studied. But the advertisement which stimulated word-of-mouth was likely to be more successful than the simply informative communications.

1.5.1 Views Towards Advertising : In Western countries has been focused on the incidence of misleading (deceptive or untruthful) advertising in various media. Schutz and

Casey (1981) study revealed that misleading advertising was seen by all the respondents, irrespective of their demographic variations, as a serious problems. Mail and telephone advertising had the poorest perception with newspaper advertising being perceived as the most "honest" by the respondents. But Bhatia (1977) found majority of the homemakers having positive attitude towards advertising and perceived advertisement as useful guide for selection of products and providing information about quality, price and availability of products. Moschis and Churchill (1979) found that younger, lower-class adolescents held more favourable attitudes towards advertising than their middle class counter-parts. Unwin (1974) found that Latin American University Students were more responsive and more favourable to advertising in consumer magazines than Americans. Male and female responses within the cultural groups also differed with regards to favourableness for advertisements.

Memory plays a major role in consumer choice. The specific inferences drawn by consumers for the product stimuli, advertising, word-of-mouth, and other sources of product-related information are heavily dependent upon what data are in memory and how they are organized (Bettman, 1979). Though consumers are exposed to numerous advertisements everyday, how much information the consumers receive from them depends on the memory of individual consumer. Females had better ability to cognitively discriminate and retain advertising information than male as

revealed by Moschis and Churchill (1979). The middle-class females were better able to cognitively differentiate and retain information from television commercials than their lower-class counterparts. Gardner (1994) found that consumers paid attention to fashion advertising. The subjects indicated that fashion advertisements were good sources of information. They agreed that there was too much use of sex appeal in fashion advertising. Thus various views regarding usefulness of commercial source mainly advertisement were obtained.

1.6 **Conclusion**

The review regarding consumer behaviour revealed that various authors have pointed out that consumers are influenced by mainly economic aspects, socio-cultural considerations and psychological attribes as well as some other factors. The economic aspects may cover buying power in terms of income, saving, loan/credits. It also covers product criteria or attributes such as product range, quality, availability, colour, performance and so on. Socio-cultural considerations include family, social class, culture, and other groups. Psychological attributes are those which exert an influence on the consumer as individual's predispositions. They are motivations (needs), perceptions, learning, attitudes, values, beliefs and personality traits. Other factors such as fashion trend, life-style, technological advances, inflations or deflation may also influence buyers behaviour. But no author

emphasized concern for the environment as a factor which may influence buyer behaviour. Also none of the author emphasized the environmental impact on buying behaviour and vis-a-vis. Hence, there is a need to study the concern for the environment in buying behaviour of consumers, especially when at the global level the world is facing environmental crisis.

2. Consumption and Conservation of Resources

Personal consumption has important ecological implications hence its role in the deterioration of the environment is of growing concern.

Numerous consumer products, such as automobiles, laundry detergents, glass and aluminum containers, pesticides and fertilizers have been identified as significant contributors to environmental deterioration (Kinnear et al, 1974). Automobile exhaust accounts for a significant proportion of air pollution. Phosphate in laundry detergents has been identified as a significant source of water pollution. Glass bottles and aluminum cans present special disposal problems because they do not deteriorate under normal disposal methods.

Domestic Pesticides and fertilizers also contribute to the problem of pollution of water resources. The wisdom the buyers exercise in their purchase decisions with regard to these types of products can either help to maintain the environment or contribute to its deterioration (Kinnear and Taylor, 1973).

2.1 Consumption of Resources

During recent years, it has become very clear that the resources of the world are indeed finite. In order to maintain a stable economic growth and a standard of living in the future, it is very necessary that the consumption of resources is done very carefully.

The functioning of ecosystem involves a continuous flow and consumption of resources. According to Saxena (1990) the sum of all physical, chemical, biological and social factors which compose the surroundings of man is referred to as "environment". Each element of these surroundings constitutes a "resource" on which man draws in order to develop a better life.

Resource is a "form of energy and/or matter which is essential for the functioning of organisms, populations, and ecosystems". (Ramade, 1984). In the case of humans, a resource , is any form of energy or matter essential for the fulfillment of physiological, socio-economic and cultural needs, both at the individual and at the community level.

The classic subdivisions of resources include renewable and non-renewable resources. Renewable being those which are reproducible or replenished through relatively rapid natural cycles such as trees and fish (Sarabhai, et al. 1990; Saxena,1990) Resources which are not reproducible and are obtained from the finite non-living reserves are called non-renewable resources (Ssaxena, 1990). Whereas

according Sarabhai et al (1990) non-renewable resources are those which are replenished through extremely slow natural cycles such as fossil fuels or which are not recycled at all such as mineral deposits. Some authors classify resources in to biotic (living)/abiotic (non-living); inexhaustible/ exhaustible; conventional/non conventional; immutable/ mutable; maintainable/ non-maintainable; reusable/ non-reusable (Owen, 1971; Odum,1971; Saxena, 1990).

It has been estimated that the world is capable of supporting only 100 crore people at the living standards currently enjoyed by the most developed nations. Various countries of the world consume disproportionate amounts of the earth's resources due to population size and inequitable geographic and economic distribution of resources. The United States with less people has a much higher consumption of resources than India with many people (Sarabhai et al.,1990). The population growth in America is one per cent per year where as the exploitation and consumption of mineral resources is increasing at the rate of 10% per year (Saxena, 1990).

It is, now very clear that population growth has increased the per capita consumption of resources, leading to their depletion. Estimates have shown that the consumption of minerals like aluminum,copper,iron,lead,zinc, has been on the increase (Karpagam, 1991), as also that of energy like coal, crude petroleum and natural gas.

The resources, attention of the world was drawn in early seventies towards the situation of energy resource especially after Arab oil embargo of 1973-74, probably because "energy is necessary for daily survival" (Brundtland Commission, 1990). With the growing requirements of industrialization, urbanization, the transport sector and of rural commercial energy requirements, energy is intricately linked to the development of the country (Khoshoo,1986 p.XIV, UNCED Report, 1992). In fact, there is a correlation between level of development and amount of energy used by a country. Energy is very critical to development aimed at human welfare covering household, agriculture, transport and industrial sector. More than 80% of total world consumption of energy is by developed world which accounts for only 30% of the population, whereas 20% of the energy is consumed by 70% of the world population in developing and socialist countries (El - Hinnawi and Biswas,1981).

The energy resources can be classified in to categories as (1) commercial (2) non-commercial . The chief sources of commercial energy are coal,oil,lignite, natural gas,hydro-electricity and to some extent atomic energy. The non commercial has two categories. (1) renewable sources like solar,wind,geothermal, microhydel and so on. (2) Non-renewable which include all bio-mass based systems like agricultural residue, biogas, fire-wood, animal dung besides drought-animal and humanpower (Khoshoo 1986,pp.144-45).

Commercial energy constitutes roughly one half of the energy utilized in India. While total commercial energy consumption has gone up from 1400 mega watts in 1947 to 64000 M.W. in 1990, the per capita consumption is only one-eighth of the global average (India, 1990, A Reference Annual p.483). On an average, each person in India uses the equivalent of about 1 kg. of fuel per day (Parvati et al, 1995).

Of various sectors of energy demand and consumption in India, the household sector is an important one. It consumes nearly half of the nation's total energy (State of India's Environment, 1982; Sixth Five Year Plan, 1980-85), and 13.7% of total commercial energy consumption (ABE, 1985). In household sector 680 K cal per person per day is consumed and of which 620 K Cal is used for cooking, 30 K Cal for space heating and 30 K Cal for lighting. The fuel consumption for lighting and cooking show that 53% of lighting in urban areas is from electricity and 45.2% is from kerosene (ABE, 1985). It was observed that the importance of coal for cooking energy in India has been steadily decreasing and that of oil products like kerosene and L.P.G. has been increasing (A Citizen's Report, 1982). The household sector accounts for about 20% of the total oil used in India. The kerosene consumption in 1992 was about 4 million tonnes per year. Whereas according to Parvati et al (1995) India consumes six million tonnes of kerosene every year and it is anticipated to increase. For domestic energy liquified petroleum gas (L.P.G.) is fast becoming the most

popular cooking fuel especially in Urban areas. It is cleaner, more convenient, more efficient and less polluting than traditional cooking fuels. The production of LPG shot up from 6,71,000 tonnes in 1985 to 27,64,000 tonnes in 1990 (National Report to UNCED, 1992). Substitution of L.P.G. for oil, coal and even electricity is recommended by Flavin (1992) as it represents one quarter of world fossil fuel use but accounts for only 17% of carbon emission due to its lower carbon content. In some places Natural gas is supplied through pipe-lines till the point of use. It yields about 1000 B.T.U. per cubic foot (Ruth and Boxali, 1948).

The most common sources of energy used by most of the families living in Urban areas of Gujarat and Haryana were Natural gas (pine-line), L.P.G., electricity, kerosene, coal and petrol, of which electricity was used by all families for lighting home and some families used it for operating electrical appliances. Petrol was used for transportation (Gandotra, 1983; George 1983; George and Ogale, 1983; Kaul, 1984; Chaturvedi, 1984; Goel, 1986). Family income was found to be the best indirect predictor of residential energy consumption.

In America as family income increased, the increase in consumption of gas was gradual, the increase in electricity was intermediate and the increase in gasoline was sharp (Newman and Daywachetel et al, 1975). There was an increase in the amount of various sources of energy utilized as

family income increased. (Gladhart, 1975; Morrison et al, 1978; Yao, 1980). Socio-economic status was another variable which influenced energy consumption among the variables such as family income, stage of family life cycle, socio-economic status, size of the family and family values. High socio-economic status was closely related to high energy consumption (Baker, 1979; Bailey, 1980; Uusitalo, 1983; Goel, 1986). Among the personal characteristics of the homemaker, a positive correlation was found between the energy consumption behaviour and their education (Morrison et al 1978; Ayotoallahi, 1980; Uusitalo, 1983; Kaul, 1984). A positive relationship between education level of homemaker and perception of energy crisis as well as coping measures adopted during crisis was found by Goel (1986).

One of the important factor which determines the households energy use is the number of appliances used in home. Morrison and Gladhart (1976) and George (1983) concluded that the number and kind of major appliances owned by a family were closely related to family's income level. More the number of electric appliances and greater the intensity of their use, higher was the energy consumption. (Mc New, 1980; Uusitalo, 1983). George (1983) revealed that almost all families expressed the desire to reduce energy consumption as well as avoid wastage of energy, but at the same time, they were desirous of owning big household and recreational equipment, which would consume large quantities of electricity.

Uusitalo (1983) and Giles (1980) revealed that life-style factor may even prove to be more efficient explanatory variable than socio-economic or demographic variables for determining energy consumption. Life style modifications could promote energy conservation (Giles 1981).

2.2 Conservation of Resources

There is no doubt that the rapidly growing world population is strains the earth's carrying capacity today. The world is not only running out of non-renewable resources but also facing the destruction of renewable resource system's capacity to regenerate. Mr. Kamalnath, Minister of Environment and Forest, India, pointed out in UNCED conference (The Earth Summit) at Brazil in 1992 :

> "The long term impact of past industrialization, exploitation and environmental damage can not be wished away. It is only right that development in the remaining part of this century and in the next be more conscious of its long-term impact. Our common future can only be achieved with a better understanding of our shared responsibility. Shared responsibility for the present and past.
>
> At a global level, the common future depends on sustainable use of natural resources. The current pattern of development based on high resource consumption, high waste and low recycling is not sustainable".

If the future generations should inherit a rich resource base, people must conserve the earth's resources. Limited resources of the world are indeed a sacred trust of the present generation which it owes to the generations that will follow (Khoshoo 1986).

Some consider "conservation" as total restriction on consumption of resources. To some, it means "hoarding" or to control supply of goods in such a way that some part is left for the future. Dictionary defines it as "an act of preservation". The term was proposed by Gifford Pinchol in 1908 and was defined as" use of natural resources for the greatest good of the greatest number for the longest time". (Saxena, 1990; Karpagam, 1991). World conservation strategy defines conservation as,

> "the management of human use of the biosphere so that it may yield the greatest sustainable benefits to present generation while maintaining its potential to meet the needs and aspirations of future generations."
>
> - Khushoo, (1986)

Resources conservation simply means less consuming of virgin natural resources than one otherwise would. Conservation is the process of prolonging the useful life of resources, either by preserving or by reusing and recyling (Karpagam,1991). "Effective ways to conserve both renewable and non renewable resources include reducing wasteful consumption and by recycling whenever possible" (Sarabhai et al 1990).

2.2.1 Methods of Conservation

Several methods/strategies have been suggested by conservationists. The first and the most important one is waste reduction. Resource conservation basically means reduction of the amounts of solid waste that are generated besides reduction of overall resource consumption and

utilisation of recovered resources. Waste reduction implied more economical and efficient use of resources, reducing environmental impacts mainly in terms of pollution and energy demands.

2.2.1.1 Ways of Waste Reduction

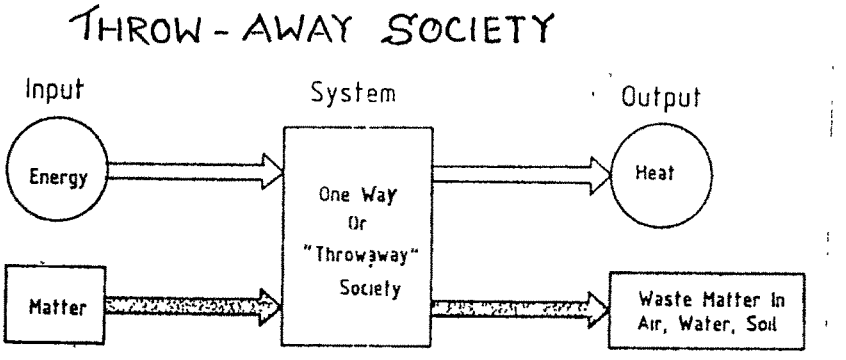
Karpagam (1991) suggests 4 ways for waste reduction.

(a) Increasing durability of products (Product life expansion) means designing products for longer use, and for easy as well as economical repair or manufacture. The replacement of unbreakable containers in place of brittle/breakable containers is an example. It means either better materials or easily replacable parts or both. So that it would reduce the waste generation and promote preservation of the natural resources.

(b) The process of material substitution would lead to more efficient energy use, will promote conservation of energy depending on technology. Aluminum is being substituted for tin in the production of metal cans and containers, plastics are used for insulation and anti-corrosive purpose where lead and zinc were originally used. Substitution of resources does not necessarily result in their conservation. True conservation requires a decrease in their use (Sarabhai et al, 1990). Thqugh material substitution is an effective technique for resource conservation, it is limited by pollution impacts, time lag and by the ability to manage the substitution process.

(c) Recycling is the most popular and practical method today for conserving resources. It means extending the life of a resource. It is both-ecological and (usually) economical (Makower, 1993). Ecological, because it reduces pollution impact, reduces land dumping, and conserves scarce resources. Economical, because it saves cost of extraction of virgin resources, and saves energy when recycled. It is estimated that a tonne of steel from scrap iron costs 15 to 20 times cheaper than extracting it from the ore. The pollution of air decreases by 86% while the pollution of water by 76%. The energy saving in recycling aluminum is 96% in comparison to bauxite extraction which is the original ore for obtaining aluminum. By recycling paper there is reduction of pressure on forest. A tonne of recycled paper saves 4 m^3 of timber, 900 m^3 of water and reduces the consumption of electricity by 50 to 64 per cent (Saxena, 1990, Makower,1993). This needs 58% less water, results in 74 percent less air pollution and 35% less water pollution, reduces solid waste going to land fills and at the same time creates five times more jobs compared to producing a ton of paper from virgin pulp (Makower, 1993). A tonne of recycled news paper saves a tonne of wood, that is, 12 to 17 trees (Brown and Shaw, 1982; Makower,1993). Glass, when recycled saves 8% energy but re-use of glass containers saves far more. Commonly recycled products and materials are aluminum, glass, paper, plastic, corrugated card boards, tires, steel cans, yard wastes, oil, clothing, batteries (Makower, 1993).

Thus, there is a global realisation of the fact that single use of some of the important materials like metals, glass and paper would lead to scarcity of these materials because their feed stocks would get exhausted. Hence a nation that does not recycle the used materials will not be able to sustain itself (Khoshoo, 1986). The option before the world is either a Throw-away/one-way society or a sustainable/Earth-manship society (Miller, 1974).



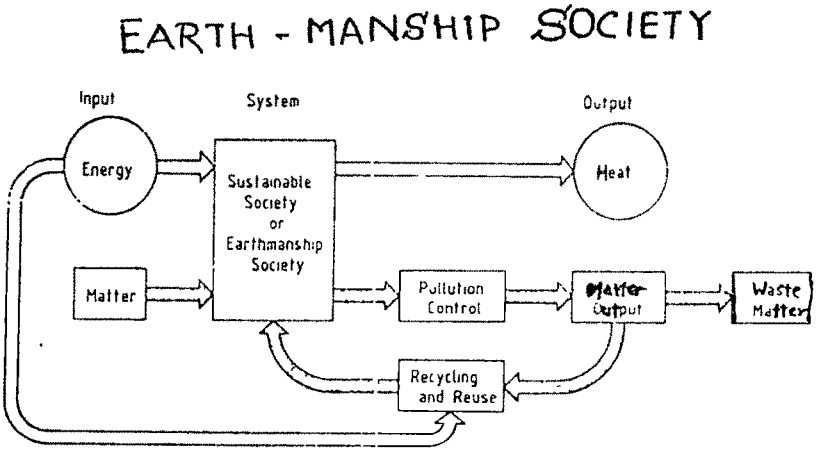


Fig.1. THROW-AWAY OR EARTHMANSHIP SOCIETY

> "The world evolved towards a "Throw-away" society when population was less, energy was inexpensive and raw materials were abundant and recycling of the used materials was not feasible."
>
> - Brown and Shaw, (1982)

Now the shape of the things is different. The "Throw away society" or one way society of the present time can become sustainable only if there is infinite supply of materials, energy and similar resources.

> "It presupposes that the environment has equally infinite ability of absorption and resilience to return to its original condition, after unlimited quantities of waste and heat are generated. Experience has shown that this is no longer tenable particularly on account of escalating ever increasing population and shrinking resources base."
>
> - Khushoo, (1986), XIX

The sustainable or Earthmanship society aims at recycling and reusing materials, and lowering the rate of consumption of materials including forests. It also aims at conserving energy and controlling pollution, by deliberate choice. This is done so that the resources are not depleted and environment does not degrade.

But recycling is not very common. Americans in 1993 recycled only about 10 to 14 per cent of their household trash (Simmons and Widmar, 1989; Makower, 1993). The amount of waste materials recycled in Japan was 16% in 1974 and went up to 48% in 1978 (Khoshoo 1986). Probably because recycling was expensive at that time but it may be less expensive and become more of a routine in future (Carpenter, 1973). India makes three major uses of waste, namely, composting, energy generation and sanitary land fill.

Resource-recovery is a high technology area in developed countries where as in developing countries like India, garbage is sorted out by hand. The materials such as tin, glass, paper plastic and rags are reused. These waste generate employment besides generating new materials. Rag-pickers, in India can earn around Rs.20 to Rs.30 every day by working for 10 to 15 hours. In fact, India, has had a market for , waste paper, rags, empty bottles, plastic items and milk bags for a long time. "Recycling psychology" is already built in the Indian population (Khoshoo, 1986). The objective behind this may the economic gains. Nambiar (1995) in a study revealed that 80 to 90 percent of the homemakers adopted various common recycling techniques regarding kitchen and other waste generated in the household. "No recycling" was considered as one of the major factor contributing to resource scarcity as opined by the homemakers of her study. All of the respondents were of the view that resources must be recycled and must be used sparingly.

Studies suggest many reasons why people may choose to participate in recycling programme. Some people participate in resource conservation activities because of basic underlying values toward the consumption and use of things (Simmons and Widmar, 1989), whereas some do so due to the sense of responsibility towards future and the environment (Webster, 1975; Arbuthnot, 1977; De Young, 1984). As a part of recycling effort many respondents in Simmons and Widmar's

study (1989) "did not mind rinsing out bottles and removing caps before recycling". Overall recycling behaviour mean was found to be 4.51 out of 5.00 which provided a measure of the degree to which individuals participated in recycling on day-to-day basis. A conservation ethic was reflected in saying one must make wise use of natural resources.

(d) Marketability of industrial wastes is also suggested as an alternative for recycling. The waste of one industry can become an input for other industry.

2.2.1.2 The Three R's

Apart from industry, the family is a logical place to practice the conservation of resources and to form and develop the conservation ethic that is so essential in present times (Paolucci, 1976; Naffalin, 1976). The real power for constructive change lies at the individual level and the level of the family (Meadows 1976). "Social and economic change always starts with individuals..... Some of the conditions of sustainability can be satisfied by individual life-style decisions....." (Brown, 1991).

As families and individuals make dozens of decisions that directly affect the environment of the Earth, it is advocated to make "green choices" and to become a "Green consumer". By `choosing carefully, one can have a positive impact on the environment without significantly compromising one's way of life' (Makower, 1993). It was said that if one cares for the environment, one has to drastically reduce

one's purchase of every thing, such as food, clothing and other "life-style" items-to a bare minimum. That approach simply does not work in today's increasingly convenience and consumption oriented society. No one wants to go back to a less comfortable, less convenient way of life. At its core, Green consumerism has to do with cutting waste and making the most of one's resources. Hence, the Green consumer movement suggests to remember "The Three R's : **Reduce, Reuse and Recycle**". They are in descending order of preference.

(1) **Reduce** : This recommends avoiding buying wasteful and polluting products. These products can be those that are - (i) Single-use items and other products which have a short life before they must be thrown away. (ii) Wrapped in many layers of packaging. (iii) Packaged in unrecycled or unrecyclable materials. (iv) Not energy efficient. (v) Made by companies with poor environmental records.

Reduce is also known as "pre cycling" that is eliminating wasteful products before one purchases them, rather than having to reuse, recycle or otherwise dispose of them later.

(2) **Reuse** : It is important to buy products that have longer life and hence can be reused over and over to conserve resources. Things that may only be used once before being thrown away are an inefficient use of the precious resources. Today, market is flooded with single-use, throw-away products. Here the Green consumer has to make real

choice. For example buying rechargable battery than throw-away one. Though it would cost a little more initially but it would recover the cost of equipment and electricity bill for recharging it. It is recommended to look for products made from or packaged in recycled material. By doing so a consumer is supporting the reuse of resources.

(3) **Recycle** : It is important that after considering refuse and reuse of product as much as possible, whatever left, is recycled to get the most use out of all the resources which have been used by consumer and the producer. Out of three R's, in hierarchy, recycling is the third choice which is done after avoiding wasteful purchases altogether and reusing things as much as possible.

Women's Environmental Network (May, 1992) suggests to reduce, reuse and recycle packaging to conserve energy, reduce emissions from power stations, to help reduce global warming, and cut down toxic by products of packaging materials.

2.2.2 Energy Conservation

A considerable attention has been paid for energy conservation. Meadows (1976) suggested that for conserving energy one should give up television set, become vegetarian, buy food in bulk, shop in one trip, buy a small car, reduce family size, recycle cans and bottles, refuse buying things whose packaging is a major component of their cost, pay

attention to electric meter, support environment organizations and try to use solar energy.

Petroleum Conservation Research Association (PCRA, India) has given 12 fuel saving hints for house wives to make the gas or kerosene last longer every month such as reduce the flame when oiling starts and the smaller burner saves fuel every time. They claimed that 30% of the fuel could be saved by following good fuel efficient cooking methods as revealed after the researches.

Over and above supporting the suggestions listed here, use of solar cooker as a measure to conserve energy is advocated by GEDA (Urja Patra, 1994). Fuchs (1974) suggested twelve methods for conserving lighting energy without reducing quality of lighting design.

Home heating and cooking require considerable quantities of energy. Three appliances use high energy, viz. refrigerator, television and air-conditioners. These have undergone major and minor change in design for energy efficiency since the energy "Crunch" began (Butel 1975). Other biggest energy users excluding central heating system are water heaters, freezers, cooking ranges, clothes washers, clothes dryers, dishwashers, portable space heaters and lighting devices (Makower, 1993).

A careful selection of energy efficient equipment and there after proper maintenance of them also conserves energy (Berg,1974; Makower,1993). Better insulation, helps to cut

down energy consumption (Berg, 1974; Gaskell and Ellis, 1982) According to Grasso and Buchman (1982), thicker, heavier window shades mounted close to the window are most effective in reducing energy flow through windows by conduction. Light and opaque shades are most effective in reducing energy flow by solar radiation. During cooling season, a light opaque shade can reduce energy costs by 60% and about 40% during the winter.

Many studies revealed that families followed energy conservation practices. Ayotollahi (1980) found majority of the car-owner practicing more conservation in the use of gasoline recently than before. Wilhelm (1982) reported that a reduction of 1.8 percent in direct household energy consumption was observed between 1977-78 and 1979-80.

George and Ogale (1983) revealed that the households exercised conservation in their energy use to some extent with reference to home lighting, comfort in living, use of small appliances, food preparation and refrigeration. Gandotra (1983) found that families were careful in saving fuel on transportation and refrigeration. Kaul (1984) found that majority of the households followed conservation practices in relation to home lighting, use of fans, equipment and transport. They did so for "keeping energy bill down" and "to save money" but not "to solve energy problem" or "to avoid future crisis". Chaturvedi (1984) concluded that majority of the household had low or just average fuel management practices. These included the fuel

conservation practices as well as those practices which helped to increase the equipment efficiency. Goel (1986) found that conservation measures were generally adopted by households irrespective of any energy crisis situation. Substitution/supplementation and adjustments were generally made during shortage of energy form than during their price rise. Homemakers showed concern for conservation of energy only to the extent of reducing expenditure on fuel by different ways without sacrificing their comforts and convenience associated with energy use. At the end of Home Energy Conservations Workshop organised by GEDA, attended by about 200 participants, ranging from school children to retired professionals, it was revealed that they were also wise "energy-shoppers" and wanted to know more about fuel conservation practices (Urja Patra, 1994).

George (1986) reported that the households were energy intensive and were not cognizant of the severity of the energy issue. They did not value conservation ethics, but were more concerned to raise the level of living than conserve fuel forms. They checked fuel use behaviour to control fuel bill and never for collective good. They failed to respond to renewable energy technologies like solar cooker as it calls for changes in habits. Gada (1982) concluded that solar cooker was, then, yet to make an impact in the households of beneficiaries of the subsidy scheme so that remarkable reduction in the consumption of non-renewable energy forms could take place.

On the basis of review of relevant literature it can be concluded that there is an increasing rate of consumption of resources, especially energy. Though families try to conserve resources to some extent, there is still a need to increase the extent of conservation. Families are potential agents for conservation of resources. Hence they should be made aware that conservation would not lower their standard of living but increase efficient use of things. It would ultimately enhance not only their quality of life but also that of future generations.

3. Solid Waste : Classification, Quantity and Disposal

3.1 Meaning of Waste

A waste is essentially a resource, although out of place. Being not available at its right place, such a resource, would create economic problems, while its being available at some wrong place would give rise to ecological problems (Saxena, 1990). Junk (junk cars, scrap, metal or lumber), trash (paper, fibers, glass) garbage (raw garbage) and even industrial sludges are grouped together as solid waste. This comprises refuse excepting sewage or materials ground up, as by garbage disposal units, to be flushed into sewage system (Simonds, 1978, Botkin and Keller, 1979). Refuse is a term generally used for all solid waste (Karpagam, 1991).

3.2 Classification of Solid Waste

Solid wastes consist of discards of households, dead animals, industrial and agricultural waste and other large wastes like debris from construction site, automobile, furniture etc (Karpagam, 1991). Solid waste is classified as follows by Karapagam (1991) :

1) Garbage : Decomposable wastes from food, slaughter houses, canning and freezing industries and market refuse.
2) Rubbish : Non-putrescible waste like paper, wood, cloth, rubber, leather etc. which are all combustible. It also includes non-combustible like metals, glass ceramics etc.
3) Ashes : Like fly ash, residues of comubstion of fossil fuels.
4) Hospital refuse : Cotton, plaster, needles, operation theatre waste, ampules.
5) Large wastes : Debris from construction site, old furniture, automobiles.
6) Dead animals : Household, Veterinary hospital.
7) Sewage treatment process : solid or sludge
8) Industrial solid waste : chemicals, paints, sand.
9) Mining waste : Tailing, slag heaps.
10) Agricultural waste : Farm animal manure, crop residue

Khoshoo (1986) groups the wastes as follows depending on their origin, namely, (1) Agricultural (2) Fruit and

vegetable processing industry (3) Animal waste (4) Aquatic weeds (5) Community waste (6) Industrial waste (7) Construction materials.

Encyclopedia of Environmental Science (1974) classifies solid wastes into (1) Municipal wastes (2) Agricultural wastes (3) Mineral and Fossil-fuel waste. Pramod Singh (1985) divides city refuse as : (1) Garbage waste from handling, storage, sale, preparation and consumption of food, (2) Rubbish - any dry, non-putrescible material (3) Ashes - waste left after burning of fuel.

3.3 Quantity of Waste

It is impossible to quantify the amount of waste produced world wide. But according to Ramarao (1976), every year man produces 9 to 10 billion tonnes of solid waste. Majority of this waste is generated in the industrial countries (Dela Court, 1990) U.S.A.'s contribution alone is about 4.4. billion tons a year. Of this 360 million tonnes are household, municipal and industrial waste. In addition there are 2.4 billion tonnes of agricultural and 1.8 billion tonnes of mineral waste (Simonds 1978). In the U.S.A. alone, urban areas produce about 640 million kg. of solid waste each day. This amount is sufficient to cover more than 1.6 square kilometers every day to a depth of 3 metres (Schneider 1970). According to the Encyclopedia of Environmental sciences, (1974), the total solid waste generated from municipal and industrial sources in the

United States in 1973 amounted to more than $326x10^6$ metric tonnes annually. Considering the quantity of various constituents of the solid waste, the studies show that in the United States 55 billion cans, 26 billion bottles, 65 billion metal and plastic bottle caps and 7 million automobile are thrown away each year indestructible (Southwick 1976). Also they throw away 16 billion disposable diapers, 1.6 billion pens, 2 billion razors and blades and 220 million tyres. The discarded aluminum from U.S. can rebuild the U.S. commercial airline fleet every three months! In a typical year Americans discard over $27.2x10^6$ metric tonnes of paper, $3.6x10^6$ metric tons of plastics, $48x10^9$ cans and $26x10^9$ bottles. (Encyclopedia of Environmental Science, 1974). Simmons and Widmar (1989) estimate that a typical American generates 25 pounds of solid waste each week, 570 disposable diapers are thrown away each second, family of five uses 1000 glass bottles and jars each year, along with 2000 metal cans. Only 10% of the solid waste is recycled.

According to a survey by NEERI, Nagpur (1984), the total refuse generated in 174 class -I cities (whose population is above 1,00,000) was 32,400 tonnes per day which was estimated to rise upto 60,000 tons per day in 1991. In Bombay alone 3200 tons of garbage was produced per day in 1984 marking an increase of 42% from 1974 figure.

On an average an Indian generates 0.5 to 0.7 Kilograms of waste (Khoshoo, 1986, p.175). Maximum per capita refuse

in Indian cities were recorded as 0.50 kg/day and lowest as 0.066 kg/day (Bhide et al 1975). For Varanasi per capita per day refuse was 0.5 kg and the average was 350 tonnes per day. In Lucknow it was 450 tonnes and in Allahbad it was 750 tonnes per day in 1975-76 (Singh 1985). Per capita consumption of plastic in India is about 1.2 kg, whereas in the West is is 16 kg (Nidamboor, 1995).

3.4 Constituents of Solid Waste

Various authors have given various estimates of the constituents of solid waste (Kut and Hare, 1981; Singh, 1985; Canddian Environmental Protection Act, 1990; Women's Environmental Network, 1991; Mackower, 1993). A summary is presented in table 1.

The sources of these constituents can be non-returnable glass bottles, tins, aluminum, cans, metal objects, dead animals, food wastes, (peels and stalks of vegetable and fruits, plate left overs), leaves and lawn clippings, magazines and old news papers, wrappings, old clothes, disposable cups, plates, razor blades, and diapers, broken and small appliances and toys, cosmetic containers, tubes, broken china and glass ware, plastic shopping bags and milk bags, broken articles of plastic, vacuum cleaner or household sweepings, tufts of hair, and so on.

Table 1. Constituents of Solid Waste

Main Constituents of Solid Waste	Range of Estimate in Percentage (by volume)		
	America	India	Canada
1. Paper and Cardboard	30.0 - 37.5	4.68	35
2. Glass	6.7 - 10.0	0.44	-
3. Plastic	4.0 - 8.3	0.70	30
4. Metals	8.0 - 10.0	0.64	-
5. Textiles	2.0 - 4.0	-	-
6. Leather and Rubber	3.0 - -	0.65	-
7. Food and Wood	13.0 - 15.0	12.00	-
8. Yard Waste	16.0 - 18.0	15.67	-
9. Others	5.0 - 8.3	15.67	-

3.5 **Factors Influencing Waste Generation**

Wastes are produced as a result of human activities. Hence they vary with the type of human activities which in turn are affected by various factors such as climatic conditions, seasons, standard of living, location of the house, food habits, geographical locations and the like (Singh, 1985; Patil et al, 1985). Patil et al (1985) found maximum proportion of compostable matter in the samples of garbage collected from high income group areas in Pune city due to the existence of individual gardens. The proportion of paper and plastic was the highest in the middle and low

income group areas, and commercial areas mainly due to waste from packaging materials.

The results of analysis of 33 cities of India show that the plastic, glass and paper contents increase in the refuse with the growth of population and growing standard of living of urban dwellers. It was attributed to the use of commodities made of plastic, papers and others which were considered marks of sophistication (Singh, 1985).

Although there is some geographical variation in the characteristics of municipal solid waste, social, political and economic factors cause the major variation in physical and chemical composition of waste (Encylopedia of Environmental Science, 1974).

3.6 Disposal of Solid Waste

Nature has demonstrated its capacity to disperse, degrade, absorb or otherwise dispose of unwanted residues in the natural sink of the atmosphere, inland water ways, oceans, and the soil (Encyclopedia of Environmental Science, 1974). But the volume of waste generated by today's population is beyond the earth's natural capacity.

Generally the bulk of solid wastes are deposited on land, and the disposal tends to be a local problem. The local governing body primarily manages for collection and disposal of garbage

Ali (1992) after assessing the garbage collection systems in selected resettlement colonies of Delhi and identifying the major problems, revealed that, in addition to the garbage collected in the masonry "dalaas", dumper bins etc. 886.86 cft of garbage was found dumped along "nallas", parks, and road side. The people's preference for location of garbage bin had not been taken into consideration. On an average there was one garbage collection bin for every 500 plots which was found at a considerable distance from the houses. On account of the life style, literacy level, and perceptions of the people, they preferred to throw the garbage on the street or into the drains than to carry it all the way to the garbage bins. Most of the people felt that the job of keeping neighbourhood clean was that of Municipal Corporation and people did not have anything to do with that. The survey showed that the people did not wish to participate in keeping their neighbourhood clean. While studying the knowledge and practices of house wives in household sanitation in rural areas, Bhatnagar (1968) and Pendse (1969) found that majority of the respondents in rural areas used an uncovered garbage pit and many used front of the house as the place for garbage disposal.

3.7 Options for Waste Disposal

By tradition the refuse is carted off to dump it somewhere "out beyond" in rotting, rusting heaps (Simonds, 1978). As the population expanded, the diluge of urban

garbage first began to fill revines and then whole valleys - creating dismay, discomfort and health hazard to the communities in neighbouring. As an alternate solution, some coastal cities carelessly transported their mess out through their harbours and dumped it into the sea. The sea responded with decimated harvests of fishes and contaminated yields of seafoods of all types. The ocean rejected the waste material which was washed back on the shores to litter the beaches. Some cities in desperation, have turned to burying their refuse which creates problems of trailing and blowing litter, the spreading fowl odour. There is a possibility that subsurface water sources may become contaminated by burying the waste. Some countries incinerate the garbage under intensive heat. But these create the air of thermal pollution. Simonds questions,

> "If we can't hide it, burn it, sink it or bury it - what then can we do with our wastes?"
> And he himself answers - "Reuse or Recycle".

Kut and Hare (1981) give following options of disposal so as to make the saying "today's trash is tomorrow's cash" come true. The waste can be either disposed by the way of incineration/burial or sent for recovery of materials (glass, metals, paper, plastic) and energy (fuel, compost). The residue of recovery procedure can be used as sanitary land filling.

Integrated Solid Waste Management systems consist in order of their occurrence of (1) source reduction (2)

recycling (3) compositing (4) combustion (5) land filling (Yoon, 1994).

Recycling is the reutilization of expended man-made products and natural resources (Simmonds, 1978). It is considered as the stage with greatest potential for dealing with the problem of rapidly-growing solid wastes. The rate of recycling is largely dependent on local political, demographic, economic and technological conditions (Yoon, 1994).

Simmons and Widmar (1989) studied motivations and barriers to recycling with an aim to find out what influences individuals to reduce their own production of garbage and to participate in recycling programme. Attitude for the sense of responsible action and conservation ethics were found to be significant predictors of recycling behaviour.

Purchase behaviour related to the generation of waste was studied in households by Shanahan and Zetterstrand (1993) as a joint project with the waste Management Department, Municipality of Goteborg, Sweden. Results showed that the purchase behaviour changed when the households became engaged in the separation of waste material.

Nambiar (1995) tried to find out kinds of practices followed in recycling of waste by urban population in India and reported that all the respondents opined that resources must be recycled. Several resource conservation and recycling measures were popularly practiced by a large

number of households, such as polythene bags used for storing vegetables in the refrigerator, one side used paper converted to scrap sheet for making notes, lists; empty tins used for potting plants and so on.

Thus, the review of literature on solid waste gave an insight into the meaning, classification, volume, constituents and the possible options for waste disposal. Very few research studies could be traced which investigated the waste disposal practices of the households and the views of people towards reuse and recycle. Also no study could be traced which focused its attention on the knowledge of people regarding recycling ability of various waste materials. Therefore environmental concern in waste disposal practices was studied in the present investigation.

4. Environmental Concern In Individuals

Environmental quality has been a major consumer movement issue. In response to a growing interest in this area, researchers have investigated the relationships between a number of demographic and socio-psychological variables and concern for the environment and tried to establish profiles of environmentally concerned individuals. In various studies environmental responsibility has been operationalized through a variety of attitudinal and behavioural measures. (Harry, Gale and Hendee, 1969; Anderson and Cunningham, 1972; Peters, 1973; Kinnear and Taylor, 1973; Heberlein et al, 1974; Kinnear, Taylor and

Ahmed, 1974; Dunlap and Hefferman, 1975; Dunlap and Van Liere, 1975; Koenig, 1975;; Webster, 1975; Tucker 1980).

The independent variables considered in these studies were demographic, socio psychological, socio-economic and personality variables (Harry, Gale and Hendee, 1969; Anderson and Cunnngham, 1972; Kinnear and Taylor, 1973; Dunlap and Hefferman, 1975; Dunlap and Van Liere, 1975; Webster 1975). Personality variables were found to be better predictor of ecologically concerned individuals than socio-economic variables (Kinnear, Taylor and Ahmed, 1974). Anderson and Cunningham (1972). found a number of demographic measures to be significantly related to Social Responsibility Scale (SRS). But Kinnear, Taylor and Ahmed, (1974) found no demographic variables statistically significant in relation to ecological concern index, although the income results formed an interesting pattern.

Anderson and Cunningham, (1972) found socio-psychological variables more effective in differentiating between the high and low socially responsible consumers than demographic variables. The attitude toward pollution abatement was found helpful in discriminating the degree of consumer concern over environmental pollution (Kassarjian, 1971).

Tucker (1980) considered social class, age, income and social responsibility in his attempt for identifying the Environmentally Responsible consumers and to study the role

of internal external control of reinforcement. His findings were not consistent with the results of previous studies that suggested environmentally responsible individuals tend to be younger, from high income group and from high occupational status as found by Anderson (1972).

Tucker (1980) collected data from females from the State college, Pennsylvania area in a two stage process in order to explore the relationship between the construct of internal-external control and multiple attitudinal and behavioural measures of environmental responsibility. The first stage involved administration of questionnaire containing personality and attitude scales and demographic and self-report behaviour items. In the second stage the subjects were asked to indicate their choice as a free gift from a list of available detergent brands and give the reasons for choice. These detergents varied in their phosphate content. Then they were asked to select six-packs of 12 ounce `Pepsi-Cola' in either return bottles or in cans. The environmental responsibility measures consisted of these two product selection decisions. The returnable bottles were categorized as the environmentally responsible alternatives. Secondly, the phosphate content of the selected brand of detergent indicated the extent to which subject's behaviour was environmentally responsible. Thus with observed behavioural measures the environmentally responsible behaviour was found out.

4.1 Meaning of Environmental Concern

The concept of ecological concern, according to Kinnear and Taylor (1973 and 1974) was composed of two dimensions : "a buyer's attitude must express concern for the ecology and he must indicate purchasing behaviour that is consistent with maintenance of the ecology." The level of ecological concern a person demonstrated was a function of both his attitude and his behaviour because it was considered that verbal expressions of concern were not enough. Likewise, it is possible for a consumer to purchase in an ecologically-concerned manner without being aware that he is doing so. Dunlap and Hefferman (1975) asked respondents to decide how much emphasis (via government funding) should be placed on environmental quality relative to other social goals and assign priorities to government expenditure areas. Rather than simply asking to indicate the degree of concern, they presumed that this should yield the indicator of "environmental concern". Similarly, Tucker (1980) operationalized environmental responsibility by attitudinal and behavioural variables.

Petkus (1994) stated that an "environmentally responsible consumer role-identity" construct, composed of self-oriented and other oriented factors in the investigation of social psychological process associated with environmentally responsible consumer behaviour.

4.2 Studies Based on the New Environmental Paradigm (NEP) Scale of Environmental Concern

In seventies, increased public concern for the environment led researchers to measure public concern for environmental quality. Rather than continuing to focus on narrowly defined studies of environmental attitudes toward pollution, land use, waste or energy, Dunlap (1978) and Van Liere et al (1981) studied the "new environmental paradigm" (NEP) which was emerging in society that challenged the older view of an anthropocentric, anti-ecological order. They reported that more general beliefs had emerged in society about "limits to growth, the balance of nature, and the rights of man to modify nature", and were associated with other similar anti-anthropocentric views such as the "space-ship Earth" image. A 12-item NEP scale was developed to test these opposing views of how mankind regards the natural environment. They concluded that the 12 items comprising the NEP scale form "an internally consistent and unidimensional scale" (Dunlap and Van Liere, 1978 p.14).

This scale was applied by various researchers in a variety of National Parks, as a part of large project. (Wellman et. al. 1979; Aveni, 1980; Noe et. al. 1981; Scott, 1981; Noe, 1987; Noe et. al. 1988; Cofer Shabica et.al. 1990). The findings of Noe and Snow (1992) confirmed the multi dimensionality of the NEP scale items and recommended to continue using the 12 item NEP scale or, not less than 9 scale items. This scale has been administered in ethnic and

cross-cultural studies seemingly without problems in translation (Pierce et al, 1987; Caron, 1983; Scott, 1982).

4.2 Environmentally Responsible Behaviour

Predictors of responsible environmental behaviour were studied by Beck and Jennings (1982), Borden (1984-85) Kronus and Van Es (1976). They focused on one of several variables (eg. Knowledge) and which have accounted for only a small percentage of variance. More comprehensive studies were conducted by Klingler, (1980), Ramsey, Hungerford and Tomera, (1981), Hungerford and Tomera (1986-87), Sivek and Hungerford (1991) and Trisler (1994). They conducted a meta-analysis of environmental behaviour research and were able to identify the variables strongly correlated with responsible environmental behaviour. The variables were verbal commitment, locus of control, attitude, personal responsibility, knowledge, incentives, appeals, information, feedback, perceived skill in using environmental action strategies and level of environmental sensitivity.

Sivek and Hungerford (1991) recommended that the variables such as knowledge, perceived skill in using environmental action strategies, level of environmental sensitivity and locus of control should be addressed in formal and non-formal environmental education programme. Real experience in solving environmental problems instead of using hypothetical examples must be offered (Hicks 1994).

Hungerford and Volk (1990) recommended that, issues must be the focus of instruction instead of creating just environmental sensitivity or issue awareness.

Taking these recommendation into consideration Hicks (1994) studied the effect of environmental action oriented lessons on environmental knowledge, attitude and behaviour of high school students who attended Penn State's Conservation Leadership Schools and suggested that locus of control contributed to environmental attitude and to environmental action behaviour.

Smith (1992) attempted to design, develop and validate an instrument to assess the relationship between locus-of-control of reinforcement and environmentally responsible behaviour in university under graduate students. As a result Environmental Action Internal Control Index (E.A.I.C.I.) was created, the scores of which served as predictor variables. A positive correlation was found between scores on EAICI and scores on self-report inventory of Environmentally responsible behaviour.

It was suggested that the emphasis on outdoor recreation in American society was an important factor in the emergence of the "Environmental Movement" and corollary rise of public concern with environmental quality (Davies, 1970; Gale, 1972; Schnaiberg, 1973; Albrecht, 1972). It was implied that involvement in outdoor recreational activities creates an awareness of environmental problems by exposing

people to instances of environmental deterioration. It also creates a commitment to the protection of valued recreation sites, cultivates an esthetic taste for a natural environment which fosters a generalized opposition to environmental degradation. Membership in outdoor recreational organization leads to active involvement in the environmental movements.

In most of the studies on outdoor recreation, the involvement in such leisure activities is treated as a dependent variables to be explained by independent variables such as demographic characteristics (age, sex, socio-economic status) or social-psychological characteristics such as attitudes and values (Klausner, 1971; Burdge and Field, 1972). The bulk of social science literature treats attitudes and values as independent variables influencing human behaviour (Wicker, 1969; Rokeach, 1973). In contrast, Dunlap and Hefferman (1975) believe that behaviour (that is the participation in outdoor recreation activities) influenced attitudes and values (the environmental concern).

The review of literature regarding environmental concern in individuals gave an insight into the meaning and the variables affecting environmental concern. Various attitudinal behavioural measures were considered to study environmental concern, rather than asking the respondents directly to indicate the degree of concern they have.

5. Environmental Concern in Marketing : Its Changing Social/Environmental Role

Markets are currently segmented principally on the basis of demographic and behavioural variables (Kelley, 1971) and personality or socio-psychological attributes (Anderson and Cunningham 1972). With the growing consumer sensitivity to social and environmental problems, markets will be evaluated (increasingly) according to the degree to which consumers buy with a concern not only with personal satisfactions, but also or societal and environmental well-being.

Kinnear and Taylor (1973) studied the effect of ecological concern on brand perception of detergents and concluded that it was unlikely that the purchasing pattern of consumers would shift enough to non-polluting products to force those products that pollute, to go off the market. Large proportion of the sample was not motivated to perceive products on the basis of concern for the ecology, Other methods such as legislations and moral pressure on producers and distributors might be necessary to assure elimination of polluting products.

The sale of phosphate built detergent was banned or restricted from use in about a quarter of the country since 1970s in U.S.A. The laundry practices and satisfaction of consumers before and after phosphate detergent ban were studied (Woodard et al, 1990). The findings revealed that practices had not changed significantly. Olson (1978) and Purchase et al (1982) reported that practices had changed to

include greater use of bleach, hot water, fabric softeners and pre-soak products.

Thus, it is clear that manufacturer of goods must be concerned regarding environment if they want to be in the market and get the "Eco-label" for these products which are "Green" because consumer's awareness and search for such products is increasing.

6 Eco Labelling

Since '80s, the growth of interest in the endangered state of environment is quite rapid. The conscientious citizen is ready to buy an environmentally beneficial product in order to help the protection of the environment. Eighty seven percent of surveyed consumers in a poll in U.S.A. were ready to pay more for environmentally safe products or packaging (Salzman, 1991). The consumers are helped in their goal by the eco-label or environmental label provided by a recognized body.

6.1 Meaning of Eco-label

> The environmental label is an environment-related identification, which may be awarded to products which, in comparison with other products serving the same purposes, are particularly acceptable in terms of environmental protection.
>
> Troumbis (1991).

The particular environmental acceptability of a product may be due to various factors. Some important ones are -

* low noise or pollutant emission
* helpful in reducing waste generation andeffluent discharges.
* minimization of harmful ingredients or
* helpful in conducting towards recycling waste.

Entirely environmentally sound products do not exist. Each product has an impact on the environment. In fact, its very existence means it has had some environmental impact (Troumbis, 1991; Makower, 1993).

The product can be called environment friendly only in a relative sense. The goal is, then, to choose products that have minimal impact on the environment. Impact(s) on the environment may be generated during various phases in the life-cycle of a product.

(1) Manufacturing Stage - through emissions and wastes.
(2) Transportation and distribution stage - through packaging and fuel use;
(3) Utilization and Consumption stage - noise emissions; and
(4) Waste disposal stage - through harmful constituents in the waste material.

Life-cycle or "Cradle-to-grave" analysis is today a generally accepted and objective methodology for assessing the environmental performance of products (Troumbis, 1991; N. Suresh, 1992). In addition, in India the following criteria will be considered (Wagle, 1992).

(1) whether the product is recycled, recyclable or bio-degradable

(2) it makes significant contribution to resource conservation,

(3) it helps in reduction of factors having advance environmental impact associated with the use of the product.

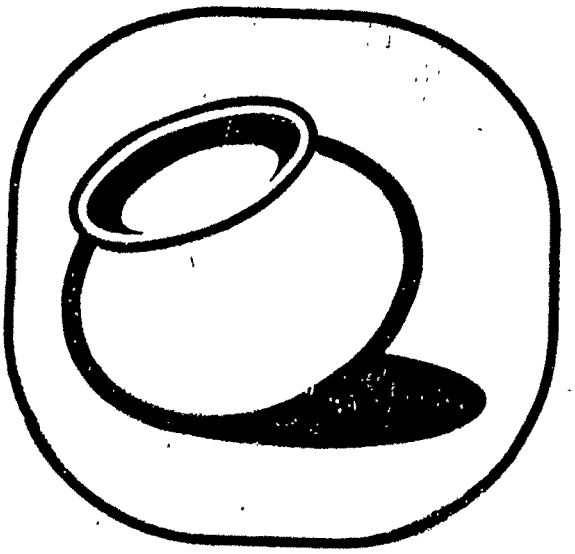
Thus, in brief,

> "any product which is made, used or disposed of in a way that significantly reduces the harm, it would otherwise cause the environment, could be considered a good environmental choice." Environmental choice, Canada, 1990)

6.2 Eco-labelling in Various Countries

In many of the foreign countries eco labelling programmes have been in operation. The examples are "Green Seal" and "Scientific Certification Systems" in U.S.A.; "Blue Angel" in Germany; "Environmental Choice" (Eco-Logo) in Canada; "Eco mark" in Japan and "White Swan" in Sweden. Such schemes operate in New Zealand and Australia too. The "Blue Angel", in Germany, was introduced in 1977 and the identification mark was given to about 3500 products by May, 1990. The purpose was to inform the consumer in a short and concise form of the essential positive environmental related properties of the relevant product compared to competitive products (Topfer,1991). The product with this mark enjoyed greater market shares by and large (Srinivasan 1992). In a survey conducted in 1990, on shelf-study, the "Blue Angel"

Fig.2. ECO-LABLES OF VARIOUS COUNTRIES

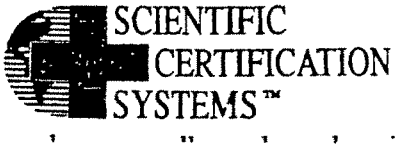


INDIA

CANADA

GERMANY

U.S.A.



U.S.A.

JAPAN

logo was recognised by 80% of the German consumers (King, 1990). In 1991 in U.S.A. Green products accounted for 7% of all household sales, 7% of all health and beauty aid products, 6% of total food sales and 3% of annual beverage sales (Green Market Alert, 1992,a,b). Sales of green products as a percent of the total were expected to increase to 10% or more in each of the four categories by 1996 (Green Market Alert, 1992, a and b).

6.3 Environment Labelling in India

The ministry of Environment and Forests, Government of India mooted the scheme of providing environmental label during the stewardship of Mrs. Maneka Gandhi in 1990 (The Illustrated Weekly of India, 1990; Suresh, 1992), which was finally signed by Mr. Kamalnath on 28th October, 1992.

The label would be provided to environment friendly products such as soaps and detergents, paper, paints, plastics, aerosols, packing material, wood substitutes, batteries, food items, lubricating oils, cosmetics, drugs, electrical and electronic goods, processed foods and pesticides. To begin with 16 items have been identified for which criteria are being set by the technical committee of the ministry (The Times of India, News service, 1992; N. Suresh, 1992; National Report of UNCED, 1992; Wagle, 1992).

The logo selected for the eco-mark is the familiar earthen pot which is used generally by village women all over India to carry water. It was selected because it represents one of the most eco friendly items of consumer

use as it is bio-degradable; can be used for storing one of our most valuable natural resources i.e. water; it symbolises water, air and the earth, and it is easily identifiable being in use throughout the country (Wagle, 1992; The Times of India, 1992). Soon, the Indian market will have soaps and detergents bearing Ecomark. Then the environment conscious consumers in the country will have environment friendly products to pick up from market shelves.

The review of literature showed a lack of information regarding this issue. The need was felt to find out the knowledge Indian people have about Ecomark. Hence, this aspect was also investigated in the present study.

7. Conclusion

The extensive review of relevant literature made clear that the resources of the earth are being excessively used. It was recognised that there is a need to conserve resources. The energy conservation has already received considerable attention. Efforts are being made to study the consumer behaviour and variables influencing it. The assessment of impact of personal consumption on environment is an emerging field of research. A few studies have been conducted in foreign countries. But it remains rather unexplored area in India. Therefore, a need was felt for finding out environmental concern in buying and consuming behaviour.