

of fresh water on earth is frozen in the Antarctic ice cap and Greenland. The fresh water available for use is a mere 0.5% of the total quantity of water and is found in lakes, rivers and underground. About 20% of the water in rivers is withdrawn annually. Groundwater provides for the needs of 20% of the world's people. Today as much as 40% of the population lives in water scarce areas and this could increase to 48% by the year 2025. Plastics have come in numerous ways to conserve water resources both for potable water and irrigation water. For water supply, plastic pipes are the only sensible solution. Plastic piping systems are light, flexible and easy to carry. They offer durability and lifelong watertight joints. They are economical too.

Plastics can do a great deal of environmental good and help in conserving resources like water and land through their use in agriculture. Plastic-based irrigation systems such as greenhouses and mulch films have increased the agricultural and floricultural output worldwide manifolds and transformed the economics of many countries.

#### **Packaging for fruits:**



India has emerged as one of the largest producers of fruits in the world. Fresh fruits retain their orchard freshness longer when stored in Modified Atmospheric Packaging (MAP). The developments in packaging materials, particularly; the advent of selective

plastic films has widened the scope for developing MAP system for storage of fresh fruits.

Plastic technology has brought in a revolutionary change in the field of materials and helped to create many substitute products replacing the conventional wooden products, thereby contributing substantially in reducing deforestation. Almost 90% of wooden crates in soft drinks industry are being replaced by plastic crates. Wooden furniture is replaced by plastic furniture.

As per the latest report, the actual forest cover in India is 20.06% and this resource has to meet the demand of a population of 950 million people and around 450 million cattle. As such, the country has to meet the needs of 16% of the world population from 1% of the world forest resources. The national forest policy stipulates – forest cover should be 33% in plains and 66% in hilly and mountainous areas. Plastic technology brought in a revolutionary change in the field of basic materials and helped to create many substitute products replacing the conventional wooden products, thereby contributing substantially in reducing deforestation.

A life cycle study of table linen has revealed that paper tablecloths are worse concerning the environment in proportion to similar textile products. This is mainly due to energy consumption, more production of waste and higher emission of CO<sub>2</sub>. Choosing a textile product with high content of polyester ensures the use of product with less environmental effects.

In Western Europe, the automobile sector uses 1.7 billion tons of plastics per year, require equivalent of 3.25 billion tons of oil to make. However, it is estimated that 12 million tons of oil is saved each year through fuel efficiency from light

weight plastics vehicle components leading to a subsequent reduction in CO<sub>2</sub> emissions of 30 million tons a year.

Energy balance studies of the food energy chain show that using plastics for food packaging can lead to energy savings, which total well over twice the energy needed to produce, fill and transport the packaging in the first place. Because of their ability to pack more using less, the energy efficiency of plastics packaging is unrivalled compared to other materials.

From the above discussions, examples and the life cycle analysis sustainable supremacy of polymeric materials in comparison with paper, metal, glass and natural materials is established. The plastics are synthesized and processed by environmentally benign synthetic techniques. Traditional materials like glass, metal, jute and paper consume high energy and water than plastic, thereby imparting more burdens on environment. At no stage of processing plastics pose a burden on environment. There is need for further research and development, awareness that plastics can conserve land, water, forests and energy resources. It has been abundantly exemplified on novel uses of plastics in agriculture. Plastics can be used in increasing the shelf-life of fruits and vegetables during transport and storage in our country. Many such novel applications can be for conservation of resources. Polymers such as polymeric flocculants are capable of purifying the undesirable industrial effluents and recycling such water for irrigation and domestic use. Plastics are part and parcel of sustainable development and will usher in the era of food, energy and environment security in our country where the use of plastics is increasing by every passing day.