

INTRODUCTION

Land is the mother of all natural resources. It provides the life support system for all living beings. Water resources — streams, lakes and ground water — are products of the land. Land and water together support plant and animal life. Conservation of these basic resources is the key to food security, fuel and fodder supply, a healthy environment, and social and economic stability. The demands on the limited amount of land we have for agriculture, forestry, industrialization, housing and transportation systems are steadily increasing with the burgeoning human population. At the same time, the productivity of the land — due to over exploitation — is gradually decreasing, leading to its physical, chemical and biological degradation. Nearly 50% of our land is waste or degraded land, and nearly 40% of our people live below the poverty line. The per capita availability of land in India has come down from 0.48 ha in 1952, to 0.15 ha today, and is posing a threat to the food chain and people's livelihoods. A vast amount of forest land has been denuded for agricultural use; and for greater exploitation of water, mineral and forest products. The result is the destruction of the earth's green canopy and an inadequate supply of fuel, fodder and timber. The impact of the green cover depletion can be seen in places devoid of trees and vegetal cover during the rainy season, with rainfall causing erosion and water runoffs.

Erosion is another serious problem that causes soil loss and reduces soil fertility, and reduces the area of cultivable land and food grain production. Dhruva Narayana and Ram Babu in the *Indian Journal of Irrigation and Drainage Engineering*, 1983, reported that “5334 million tonnes of top fertile soil is being eroded annually due to water erosion. The loss of plant nutrients through water erosion is estimated to be 5.4 to 8.4 million tonnes per year.”

There are wide variations in rainfall. An undependable and erratic monsoon introduces an element of risk, uncertainty and instability in crop production. About 80% of total rainwater is lost within 75-80 days, with the rain causing an excess of soil moisture and water run-