United Nations has its branches such as UNESCO and United Nations Environmental Programme (UNEP), United Nations International Children's Emergency Fund (UNICEF), Food and Agriculture Organization (FAO), World Health Organization (WHO), United Nations Development Programme (UNDP), International Bank for Reconstruction and Development (IBRD) which are directly or indirectly working on environmental education and protection. Among the Non-Governmental Organizations (NGOs) contributing effectively on international scale are the International Union for Conservation of Nature and Natural Resources, renamed as World Conservation Union (formerly IUCN) and its different commissions, World Natures Conservation Fund (WNCF), International Council of Scientific Unions (ICSU), International Youth Federation for Environmental studies and Conservation (IYE), International Society for Tropical Ecology (ISTE), International Environmental Protection Centre, etc. There are major regional organizations such as in USA and Europe the Union for Environmental Educations, the National Associations for Environmental Education, in the middle east the Arab Educational, Cultural and Scientific Organization (ALECOSO), in the South East Asia the South-East Asian Ministers of Education Organization (SEMEO). From the view point of natural resources and human impact on environment and biota the UNESCO's International Biological Programme (IBP 1964–1974) Man and the Biosphere (MAB 1975 continued) are most noteworthy. Reports on environmental education and selected aspects are regularly published by UNESCO–UNEP in their newsletter *CONNECT* as a part of International Environmental Education Programme (IEEP). Environmental education has to be regarded as a lifelong phenomenon rather than a school or college curriculum alone. On proper education and practice only, we shall be able to maintain the future quality supply line of our natural resources including forests, mineral resources, air, soil, water and wild life. It has to be field oriented and practical rather than only through books. It should help in solving environmental problems through proper appreciation of values, moulding of an ecological attitude of individuals towards nature, developing proper skills and participation in environmental quality maintenance.

i. Rivers receive more water
ii. Their beds get upwelled due to siltation
iii. The water carrying capacity of river is reduced
iv. The result is overflow or flood in the river and
v. Soil erosion in the watershed land.

If the watershed is hilly or of undulating topography, vegetation destruction results into rapid disappearance of top soil due to greater force of stream flow on sloping gradient. This leads to desertification of watershed lands on one hand and more frequent and severe flooding of rivers on the other. Ambasht and Misra (1980) have found that the infiltration is about 70% of the precipitation and runoff is about 68%. The soil loss rises from less than 2 t/ha/yr in vegetated condition to over 60 t/ha/yr from bare land. For flood control, there must be adequate and effective maintenance of plant cover in the watershed areas. In fact there is the need of some thing like a *"Wetland, Watershed and Riparian Protection and Revegetation Board"* for major wetlands and river systems. In India it is of most urgent necessity as our rivers are under severe strain of upwelling, pollution and floods. For some snow fed rivers, there has to be adequate monitoring of snow packs on mountains and possible quantum of melting under the expected summer temperature. In the USA such studies have been effectively used in precisely predicting floods in snow fed rivers.

There are quite a few other flood control methods: construction of *levees*, which are dikes constructed of earth or stone or cement and mortar, along river banks to protect residential property. The river beds need periodical dredging of silt in order to maximise their carrying capacity. Construction of dams is the commonest method of utilizing river water for multiple purposes such as generating hydroelectricity, fish culture and irrigation through canals. Direct lift canal from rivers are also commonly used. These reduce the quantum of water in the river and chance of flood is reduced. In India, there is the need of connecting important rivers with in-flow out-flow controls so as to direct flood water of one river to drought stricken another river system and avoid wasteful discharge of excessive freshwaters in the oceans. Water management is most important for increasing crop production, industrial growth and human health aspects.

1985 with a narrow seasonal oscillation every year (Fig. 10.2). From the isotopic carbon ratios, it is reported that the CO_2 content before the year 1850 was approximately 270 ppm or 0.027%. Since industrial and automobile consumption of fuel was negligible the CO_2 emitted by anthropogenic sources was easily balanced by CO_2 utilisation by green plants. The CO_2 cycle showed seasonal fluctuations as is also found even now but on overall annual and global basis it was balanced. In nature, the rise in CO_2 is necessarily accompanied with decrease in O_2 content which has harmful effects on human health. Thus CO_2 increase has severe adverse effects particularly on oxygen deficiency and greenhouse effect on global weather and climate. Besides the fixation of atmospheric carbon by photosynthetic plants and its release in the air in respiration and burning of organic matter, there are other natural pools of carbon that affect and regulate its content in the biosphere. Atmosphere is only a small reservoir of carbon but it plays a very significant role. There are a number of estimates on the quantities of carbon pool and transfer rates between them on global scale.

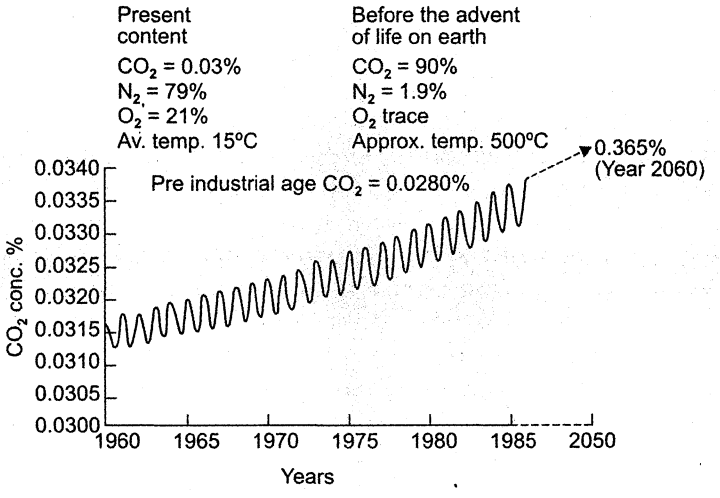

Fig. 10.2: The pattern of rise in CO_2 content on global basis between 1960–1985 and the changes that have occurred in the major gaseous content and average temperature before the advent of life on earth and to the present time.

climate. There are some other gaseous forms of compounds of nitrogen, sulphur, fluorine, bromine, iodine and the tropospheric ozone. Of course the total impact of these trace gases on the overall warming up is small as compared to the major sources listed above.

Greenhouse Effects

As already explained, the gaseous contents of the atmosphere allow most of the solar radiations in form of electromagnetic waves to pass through and reach earth's surface. Ozone layer prevents ultraviolet radiations, which are harmful and can cause cancerous growth in organisms, from passing down to earth. On hitting the earth's surface part of the solar radiation is reflected out in form of heat. This is held up by many gases much in the same way as in a greenhouse made up of glass top the sunlight enters but the reflected out heat is held up by the glass walls and glass roof and the greenhouse warms up. Hoffman and Wells (1987) have given the relative strength of different trace gases in terms of their ability to warm up the atmosphere. Among the sixteen trace gases that he has considered, methane has the maximum relative strength of warming followed by N_2O, CF_3Cl or (F 13). CF_3Br or (F 1381), CF_2Cl_2 or (F 12), and the least is of SO_2.

Hoffman and Wells (1987) have summarised data on the rate of increase of green house gases. It is projected that CO_2 content may double by the year 2056. Quinn, *et al.* (1985) quoted by Hoffman and Wells (1987) have shown that CFC 11 and CFC 12 from the 0.5 ppbv and 0.8 ppbv concentration expected for the year 2000 AD under slow growth rate may rise to 1.1 and 1.8 ppbv in the year 2030 and 1.8 and 3.0 ppbv, respectively in 2060. But if new market growth are taken into consideration the CFC 11 and CFC 12 projected concentrations range in the years 2000, 2030 and 2060 would be 0.6 and 0.9, 2.1 and 2.9 and 4.8 and 6.8 ppbv, respectively.

Thus it becomes clear that we are going to experience a general warming up of our atmosphere. Infact some warming up from 0.3 to 0.7°C has already taken place during the last one century. This is because the rate of breakdown of greenhouse gases by