estimates that 10,000 deaths occur daily in the world from starvation. Furthermore, with continued growth of population the FAO says it will be necessary to double the world's supply of food by 1980 and treble it by the turn of the century, if even minimal standards are to be met. This is a depressing prediction, considering past production and the increase in population in certain food-deficient nations.

The increased production of world food in recent years has been most notable in calorie-rich crops. From the scientific standpoint, this means that man has constantly pushed the carbon-nitrogen ratio in his diet toward higher values for carbon and lower values for nitrogen. People in the Western nations have compensated for this by massive supplements of milk, meat, and eggs, whereas those of the Eastern countries and Oceania, have resorted to fish to restore a reasonable carbon-nitrogen ratio.

But if improvements and advances are not made soon the maintenance of agricultural productivity will be difficult. Furthermore there is some question whether the current rate of removal of protein foods from the oceans and lakes can be continued indefinitely without proper adjustments in the environment. Perhaps one of the most important contributions modern biology can make to relieve the world's food shortage is in the area of preventing destruction of crops and the deterioration of foodstuffs. Such important matters are under consideration in the International Biological Program.

The earth's total water supply remains relatively stable and the "water crisis" is perhaps more related to availability than to supply. About 93 to 98% of the water on earth is unfit for drinking or irrigation because it is too salty or is frozen in glaciers or icecaps. The usable 2 to 7% that remains is not only unevenly distributed, but man is rapidly depleting it and disturbing the normal distilling hydrological cycle. This is a result of urbanization and concentration of industries in our modern technical civilization. In doing this man has created deserts, waterlogged, or salinized areas larger than all the irrigated lands of the world.

The total available fresh water supply in the United States is estimated to be 700 billion gallons per day. In 1960 we used on the average 320 billion gallons a day, estimates for 1980 are 560 and for 2000 slightly under 900 billion gallons. Thus, it is imperative that something be done about water in this country, to say nothing about areas of the world where less water is available.

We are told that soon nearly 50% of our water needs can be filled by desalting the oceans. But if this procedure is to supply more than the fringes of the continents, tremendous technological developments and sources of power will be necessary to produce and to distribute the enormous quantities of water involved. For example, for each kilo of dry matter in green plants, some 150 to 225 kilo of fresh water is required. In manufacturing, one ton of newsprint paper requires 900 tons of water, and fabricating aluminum or steel demands large quantities of water. To make a ton of synthetic rubber 2500 tons of water are needed.

Studies indicate that man can exist on 5 to 6 gallons of water a day, but in all civilized areas much larger quantities are being used. Modern sewage disposal uses much water, and in the United States the average volume is over 100 gallons per capita per day for personal use. Add to this the other domestic and industrial demands in some areas and 200 to 1500 gallons per capita may be required (Chicago uses 256 gallons a day per person).

The idea of sewage plants and industrial wastes as an integral part of man's food-producing garden may seem obnoxious to many people. But the human race cannot afford to persist in practicing the present disposal system based on a maximum both of river and lake pollution and of water demands.

Intensive work is needed on the possibilities of improving varieties of plants and microorganisms that will grow in the brackish-water areas of the world. Many halophilic or salt tolerant bacteria are known. Some of these may fix nitrogen and alter the mineral and osmotic relationships of salt water so that a variety of plants can be cultivated in these regions.

Some people have advocated increased marine farming by utilizing the microflora of the oceans as a source of food. But Borgstrom and others have emphasized that the productive chains in marine environments are more lengthy than those of the land, and that the potentialities of the sea may be grossly overrated. More research is needed however, in biooceanography because data indicates that the fertility of ocean waters may be increased in some regions.

Man has many enemies in the world, and some agents such as those responsible for plague, enteric diseases, tuberculosis, smallpox, influenza, yellow fever, malaria, and schistosomiasis have been of great ecological importance in the past.