CREATING A NUTRIENT CYCLE

Well-managed organic farms are easy to recognize. The soil looks soft and dark from the addition of compost. Often, there is mulch on the ground. Occasional weeds appear between the crop rows. Flowers and hedges are planted near or between the fields to encourage pollination and provide habitat for the helpful insects that feed on crop pests. The landscape is diversified because trees and animals are often integrated with the cropping system. In addition, in the fields, farmers and their neighbours work together. **Organic agriculture enhances people's ability to live in harmony with nature and to derive economic benefit from their land.**

Forty percent of the earth's land is agricultural cropland, managed forests or pasture, so it stands to reason that if agriculture does not exist in harmony with the rest of the earth's environment, the potential for widespread environmental degradation caused by loss of habitats and forests, and by pollution of air, soil and water from agricultural chemicals, looms quite large.

This enormous piece of the earth's real estate both affects, and is affected by, climate change and quality of soil, water and air. Inappropriate agricultural practices account for 28 percent of the soil erosion of the past 50 years. Scientists warn that as global warming becomes more and more of a recognizable reality, cultivation zones will shift, and pests and diseases will mutate and proliferate. Through intensification of livestock systems, nitrogen fertilization and irrigation, agriculture contributes to more than 20 percent of global anthropogenic greenhouse gas emissions.

Analysis of organic soil quality

Soil fertility is the cornerstone of organic management. Because organic farmers do not use synthetic nutrients to restore degraded soil, they must concentrate on building and maintaining soil fertility primarily through their basic farming practices. They depend on multicropping systems and crop rotations, cover crops, organic fertilizers and minimum tillage to maintain and improve soil quality. The natural fertilizers they use, such as green manure, farmyard manure, compost and plant residues, build organic content and increase the soil's capacity to circulate nutrients, air and water. As crops use soil nutrients, they can be replaced with natural rock

Compost application, Vuhan, China

Field of organic tea, Sechuan, China

minerals such as potassium, phosphate, calcium, magnesium and other trace elements from external sources. Organic agriculture stresses careful management to meet crop needs and avoid excess application of manure and other organic matter that could cause nitrate leaching.

In Europe, soils managed organically have 30 to 40 percent more biomass and 30 to 100 percent more microbial activity than soils managed conventionally. In some developed countries, government waterworks encourage conversion to organic agriculture to reduce the cost of purifying drinking water. In many developing countries, organically managed soils have substantially less erosion and better moisture holding capacity – an essential factor in rain-fed agriculture.

In organic agriculture, the restricted use of mineral fertilizers reduces the use of non-renewable energy (fossil fuels) and reduces the emissions of agricultural greenhouse gases (carbon dioxide, nitrous dioxide and methane). Moreover, mixed farming and soil building allow for increased biological activity by providing support for micro-organisms, earthworms, fungi and bacteria. Soils enriched with fauna and flora not only increase nutrient cycling and agricultural productivity but stabilize soils against erosion and floods, detoxify ecosystems and may even help counteract climate change by restoring "soil's capacity for carbon sequestration".

Coconut husks used as mulch in vanilla farm, Niue

The positive impact of organic agriculture practices on air, soil, water and biodiversity offers opportunities to implement international environmental agreements such as the Convention on Climate Change (the Kyoto Protocol), Convention on Biological Diversity (Decision III/11 on the conservation and use of agricultural biological diversity) and national strategies to implement the Convention to Combat Desertification.