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## **Current Status and Future of Sustainable Agricultural Development**

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## **Abstract**

Sustainability is the prime requirement for agriculture, as it is an essential means for humankind to secure their food to survive. Until the dawn of the 20<sup>th</sup> century agriculture throughout the world had been basically sustainable. Animal-based mixed farming with crop rotational systems sustained the civilization of the western world. Thorough recycling of nutrient resources in rice-based crop production system in the East Asian countries was another example of sustainable agriculture. Even shifting cultivation was quite sustainable with a long natural fallow enough to replenish soil fertility. In this way agriculture did not disrupt the environment significantly and conformed to the order of the nature.

As crop yields increased, external inputs had to be introduced. Thus, besides manures some simple natural preparations like niter and guano began to be used in Europe already in the mid-19<sup>th</sup> century, but it was only after the middle of the 20<sup>th</sup> century, when a large amount of chemical fertilizers began to be used.

Introduction of powerful farm machinery in the turn of the 19<sup>th</sup> to 20<sup>th</sup> century was another momentum towards agricultural innovation in the United States. Draft animals lost their roles in a farm and fodder crops were eliminated from the crop rotation. Animal husbandry was separated from the farms specialized in food crop cultivation. Pursuit of efficiency and scale merits in the farm operation tended to force the farmers to take the path to monoculture. This tendency had become more and more prevalent in the latter half of the 20<sup>th</sup> century. All the agricultural technologies were mobilized to push up labor and land productivity in commercialized monoculture system. Ample use of chemical fertilizers and synthetic pesticides helped to suppress stresses caused by monoculture. Government farm policies and social as well as economic facilities were also geared to encourage monoculture system to attain high productivity. Agriculture in the EU countries followed almost the same path in the years after the World War II.

In Japan, the farm size was much smaller as compared to the U.S. and EU countries, but the general direction of changes after 1950 was similar and as a result use of chemical preparations became excessive and recycling of organic wastes was almost totally abolished.

In many developing countries it had been increasingly obvious towards the

end of the 20<sup>th</sup> century that the fallow period was shortened in the traditional shifting cultivation due to an increase in population pressure and legal controls imposed on the land use. In some cases shifting cultivation ceased to be the means of subsistence but became an operation for commercial crop production without an adequate means for nutrient replenishment, resulting in rapid deterioration of sustainability of the system.

All these changes that occurred in agriculture after 1950 have weakened intrinsic sustainability of agriculture and enhanced its negative impacts on the environment, such as soil erosion and degradation, water and soil pollution, and even health hazards to the people through the food and water. As such undesirable effects had become obvious, the people and the governments in developed countries gradually came to recognize the environmental hazards of the modern high-input agriculture.

In the U.S. and EU countries, the timing of recognition of the adverse effects induced by intensive agriculture coincided with that of the economic stress caused by the overproduction of cereals in the early 1980s. This became the opportunity to direct the public concerns to the restoration of sustainability in agriculture. The USDA's Program of Low Input Sustainable Agriculture (LISA) started in 1988 as an implementation of the 1985 Farm Bills. In EU (formerly EC), too, policies to encourage deliberate extensification or fallowing started in 1985 and later in 1990 regulations encouraging agricultural practices to conserve the environment and rural landscapes were enacted. Meanwhile, the Japanese Government officially announced its new agricultural policies in 1992 to promote the environment-conserving agriculture.

Under these programs in the developed countries a variety of agricultural practices, ranging from rigorous organic farming to alternative agriculture with low external input are being exercised. For the farmers practicing these environmentally sound farming a part of the reduction in their incomes due to reduced outputs may be compensated by the premium price paid by the health-conscious consumers. However, the majority of farmers in these countries are still adhering to the conventional agricultural practices with, at best, a little reduced use of chemical fertilizers and pesticides.

In most developing countries, agriculture has not yet undergone very drastic changes from its traditional form, but an increased pressure of population and cash economy begins to force farmers to intensify their farming practices, often accompanying the use of modern external inputs. Thus there is a worry that agriculture in all these developing countries might eventually follow the same track of diminishing sustainability as already trod by that in the developed countries in their course of agricultural intensification. People should realize that agriculture is in the pivotal point that governs the life and the environment and nothing is more precious than safe food and clean water that can be secured by sustainable agriculture.