

Summary of Session 2 : Agriculture and Environment in Asia

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This session produced some lively discussions and a good exchange of views. The first paper presented an overview of the environmental issues, and related them to sustainability. The difficulty in defining sustainable agriculture is readily apparent. The concept of sustainable agriculture has so many dimensions, ranging from the time scale to the economic performance of agriculture. And it is tied in to the local, regional and global demands for food and fiber. Agriculture, as the keeper of the environment, has many demands placed on it in addition to food and fiber production. These include assimilation of wastes, providing clean water and air, protection against floods, maintaining wildlife and biodiversity, and providing a living for rural communities as well as farmers. These many demands can only be met if the environment and the soil resource are maintained as resilient agroecosystems.

A key concept is the maintenance and improvement of soil quality. This means providing for a healthy soil within a healthy agroecosystem. The concept of soil quality can apply to any agroecosystem. It is a soil that performs the functions needed to maintain sustainability. In the case of paddy soils, which were the object of two papers, it was shown that paddy rice agriculture will protect the environment by acting as buffers to water flow, preventing floods and conserving soil. These soils also remove nitrate from the leaching waters, and when properly managed, supply nutrients such as phosphorus in an available state while fixing atmospheric nitrogen. They also provide scenery and support wildlife. As such they are truly a sustainable agricultural ecosystem.

But they also are an important source of atmospheric methane which is a major component of global warming. Research has shown that the rice soils can be managed to lower very much the emissions of methane while maintaining productivity. This is a true case of handshake between agricultural production and the environment.

Intensive agriculture on the highly sloping erosive lands of China and Korea leads to a high degree of soil erosion and thus greatly lowers soil quality. To solve these problems requires not only a knowledge of how much soil is being eroded, but also ways to provide for healthy development while continuing production of food. In China, it was demonstrated that soil loss equations are suitable for this purpose. The computer simulation of soil and water resources in a basin was investigated in S. China. While preliminary, it was giving promising results. Cesium-137 also was a good indicator of loss of soil. When engineering and biological approaches were combined at the Red Soil Ecological Experiment Station, soil loss was greatly reduced. Permanent income producing vegetation such as herbs, tea, fruits, and pastures in combination with fishery and livestock on level lands gave high quality soil and low soil loss combined with strong rural development.

Korea also faces the problem of agricultural production on very steep mountain slopes. The approach, similar to that used in China, involved reclamation of the land with terraces, contours, and proper crops. Engineering and technical solutions were also applied to control serious problems in an alpine vegetable cultivation area.

Finally, we need to have some way of evaluating the public's willingness to pay for the added environmental and social benefits of agriculture. In Japan, this was done by questioning the public through a survey that asked for the monetary evaluation of non-market goods and services. This is needed to raise public awareness and get political support to halt the decline in farmland and abandonment of farms. These external or public goods were found to be valued by the public even though they could not be traded in the market place. The contingency Valuation Method (CVM) specified the roles for agriculture that were mentioned in the overview talk almost precisely. The public valued stabilization of water flow and prevention of flood and drought and preservation of wildlife and ecosystems the highest, followed by cleansing of the air and water, and prevention of soil erosion and landslides. It is important that we continue to work on ways to evaluate the public desire for an agriculture that is not only sustainable but also provides the goods and services that are so important.

Overall, this session showed the wide diversity in what sustainable agriculture means in Asia. The discussion in many ways is just beginning, and will be of major importance to agriculture as pressures to increase production keep increasing.