

## Summary of Session 2: CONCEPTS, NEEDS, AND APPROACHES FOR AGRO-ECOLOGICAL SUSTAINABILITY

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Session 2 consisted of three presentations and mostly dealt with the needs, concepts and approaches for sustainability in agriculture and fisheries.

In the fisheries area, capture areas were mentioned. The world capture fisheries resources have been exploited to the limit since the late 1980s. Over-exploitation is due to failure in fisheries management and the dismal status of fisheries resources due to open access policies and subsidy-driven over-capitalization. In contrast to capture fisheries, we have another type of fisheries: aquaculture. The only growth sector in fisheries production is aquaculture and it accounts for about 25% of all the fish consumed by humans. There are many similarities between aquaculture and agriculture, because the same concepts of agriculture can be applied to aquaculture for sustainable development. The importance of aquaculture is in the increase in access of the rural poor to productive resources and also the diversification and expansion of the economic base of the local communities. Aquaculture can play a role in two ways, so it can be considered as one of the tools of sustainable development for rural communities. The resources priority of aquaculture should be emphasized, including the integration of aquaculture and agriculture systems, to make fish more widely available to consumers. Here even in aquaculture, small-scale cooperation was indicated as the mainstream. The same is true of agriculture, as noted in another session.

In the agriculture area, the subjects can be divided roughly into two parts; intensive cropping and low potential cropping. In relation to water management, the focus was placed on the intensive cropping areas. The key to sustainable intensive crop production is adequate nutrient management to prevent the depletion of soil reserves of primary and secondary nutrients. Soil conservation through composting and green manuring is very important. There is also the issue of water management, especially important in irrigation management. Water scarcity that is a problem now, will become a larger problem in the future. Irrigation water management was discussed, mostly tackled from the non-technical constraint viewpoint, such as the socio-economic constraints. One of the issues among them is land fragmentation: the inheritance of land from one generation to another, hence leading to the fragmentation. Another is land tenure based on the sharecropping contract and the leasing contract, which tends to lessen the incentive for water management. There are two different types of water markets. One is the tube water market and the other is the channel water market. Another type of constraints is the institutional constraint, a major issue in financial difficulty, inadequate financing, and education for the management system. A drastic change is necessary, though it is hard to increase the finances. However we can think about how to manage the irrigation system. We need a people-oriented approach emphasizing people management of irrigation. The whole system should be managed not only by the government, but also by the people.

To sum up the resources management issues discussed in this session, I will refer to the paper of Dr. Craswell. IBSRAM developed the framework for evaluating sustainable land management, called SLM. This

just covers general points, but it can be expanded to very wide aspects. Dr. Craswell outlined the five pillars to achieve SLM. One is productivity, enhancing and maintaining service; the second is security, reducing the level of production risk; the third is protection, protecting the resource base and capital; the fourth one is viability, being economically viable; and the last one is acceptability, being socially acceptable. The conditions for these five pillars must be satisfied to achieve the sustainability of the system.

The new research paradigm in this area is to link increased productivity with natural resources conservation. Two kinds of knowledge are needed for this, indigenous knowledge and scientific knowledge. Not only the land and water, but also the people should be included in the landscape. These three components should be integrated at every level. In sustainable resources management, the user's orientation is also a very important aspect; participatory- and community-based approaches at all stages from planning to implementation. We must also focus on policy and the institutional issues that influence farmer and community decisions.