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# SUSTAINABLE AGRICULTURAL DEVELOPMENT: THE ROLE OF INTERNATIONAL COOPERATION

PROCEEDINGS  
OF THE  
TWENTY-FIRST  
INTERNATIONAL CONFERENCE  
OF AGRICULTURAL ECONOMISTS

*Held at Tokyo, Japan*  
22–29 August 1991

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INTERNATIONAL ASSOCIATION OF  
AGRICULTURAL ECONOMISTS  
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1992

Dartmouth

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### *Section Summary*

Given the theme of this Conference, 'Sustainable Agricultural Development: The Role of International Cooperation', it is appropriate that the part of the programme dealing with environmental issues be focused, first of all, on the subject of sustainability. This topic has been given increasing attention during the past five years by professionals and the public in general. The plenary session was opened with a broad conceptual paper presented by Dr Sandra Batie, who reviewed the various schools of thought concerning sustainability. She contrasted the views of ecologists and economists, concluding that the policy positions associated with these various viewpoints differ greatly from one another. However, there appears to be concurrence among all of them to hold the values of a sustainable, humane, and just society as fundamental. Such a society has three pillars: economic stability, political stability and ecological stability. These goals are interdependent and can be in conflict with each other.

Dr Batie drew on the concept of 'adaptive management', a pragmatic, trial-and-error approach to environmental management. This approach focuses on the three pillars and provides continuous feedback on the economic, political and ecological costs associated with a given action. Instead of seeking a deterministic answer to the question of how much environmental protection is warranted, feed-back on the interaction of these goals calls for a continuous re-evaluation and respecification of the environmental protection strategy. Dr Batie does not find wide application of this approach at the current time. However, she sees it as holding promise for answering important questions of what to sustain and how to go about it.

The discussion opening by Richard Barichello expanded on many of the issues raised in the paper, mentioning in particular the need to combine scientific information, positive economic analysis and political economy in approaching sustainability issues. It was subsequently pointed out in floor discussion that environmental problems are so pervasive that they need to be considered in the formulation of what may appear to be 'higher-level' policies. For example, trade liberalization in grains and grain substitutes could lead to there being greater incentives in Third World countries to clear forests and strain water resources. Further, adaptive management requires more than a 'forward look' at new policy proposals, whatever they are; it needs to contain evaluation of the implementation of what has gone before. Analytic

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techniques for implementation studies are already well tested in the development literature and could be utilized within Dr Batie's framework.

The second plenary session paper by Dr Ram Yadav was directed at the question of agricultural sustainability in primarily mountainous areas. In the management of these resources, Dr Yadav suggested the adoption of a 'mountain perspective' which includes considerations of the inaccessibility, fragility, marginality and heterogeneity of these areas, as well as their special cooperative advantages and human adaptive mechanisms, the results of which are embedded in a region's physical resources or social institutions. Dr Yadav evaluated development experiences in China, India, Pakistan and Nepal from the standpoint of this mountain perspective. Dr Yadav was also concerned with increasing resource demands faced by such regions. These stem primarily from population growth, increases in tourism and exogenous demand changes for minerals, hydropower and commercial timber.

The focus of the first invited paper session was on the management of common property resources. The management of fisheries has long been analyzed using this framework and was the subject of the first paper presented by Dr Trond Bjørndal. He introduced the subject with a description of current developments in the production and consumption of international fisheries. Both have increased substantially during the past two decades.

He then turned to the development of the common property framework, pointing out how the optimal levels of stock size recommended by biologists and economists diverge from one another under all but the most trivial economic circumstances. Without regulation there will generally be over-exploitation of the resource. The paper concluded with an application of this framework to the current institutional setting in international fisheries. Recently, individual countries have assumed jurisdiction over their coastal waters within 200 miles of their borders, where it is possible to regulate the total catch. Some issued individually transferable quotas to their fishermen. These can lead in the long run to an efficient and sustainable level of fishing effort.

In the next paper, common property resource concepts were applied to forest management, although Dr Kramer and Dr Ballabh prefer the term 'common pool', to avoid confusion with the actual ownership arrangements under which forested properties are held. They applied the common pool concept in three settings.

First, there are the commonly used forest resources managed through the Van Panchayats in northern India. This is potentially a flexible system with local user participation in decision making and maximum information feedback (to use Batie's concepts). They see possibilities for applying this system in other areas in India or perhaps the world. Unfortunately, recent initiatives of the state government have reduced the effectiveness of the local institutions.

They then commented on current moves to establish a system of parks and reserves in Madagascar to manage common-pool resources. They are concerned about the administrative capacity of the government to manage this scheme. The authors are now trying to measure the value of one park to tourists and to local residents, and to estimate the health benefits from public management of this common-pool resource.

Finally, the authors discussed a proposal to establish a Global Nature Fund for Forest Management and Protection. This proposal follows from the recognition that tropical forests represent a global resource and are under-managed mainly because of funding constraints in the developing countries. Financial support for the fund would come from the rich countries and would be received by those now eligible for aid from the multilateral agencies. This proposal would be most productively applied in those circumstances where the public goods nature of the services from forest environments is most pronounced. As pointed out by the discussion opener, there may be formidable political difficulties with this approach.

More generally, there was considerable discussion of the assumptions and wider applicability of the particular illustrations of resource management schemes within the papers. It was also emphasized that distributional issues should not be ignored. Allocation of property rights, auctioning of quotas, and framing appropriate tax and compensation schemes were all mentioned as key issues for examination. The papers also provoked discussion of appraisal methods and of the value of the 'new institutional economics'.

The final invited paper session consisted of a review of information relating to climate change and its agricultural consequences, prepared by Richard Adams and presented by Timothy Mount, and another on air pollution, the most pervasive internationally linked environmental problem, by Sten Nilsson, in which the focus was on forestry in Europe. It was clear from both papers that we have only very incomplete information about the physical relationships between air pollution and climate changes and production in agriculture and forestry. If we could list standard errors with our economic estimates, they would be very large. Among the tentative conclusions one might list from these two papers are the following:

- (1) climate change is not likely to be a food security issue,
- (2) under some climate change forecasts, the net economic effect might actually be positive.
- (3) there are likely to be regional shifts in agricultural production patterns,
- (4) costs of mitigating pollution problems in agriculture are likely to be high,
- (5) there has been considerable progress in controlling air pollution in Europe,
- (6) impacts of air pollution on forestry production are considerable, and
- (7) much more air pollution control is possible, but using the best technology is expensive.

At this point, and in conclusion, it may be good to remind ourselves of Sandra Batie's proposal for an adaptive management approach. When so little is known about the physical-biological relationships with which we are concerned, when consequences of our actions may extend over many generations, and when we may have opportunities to adapt our technologies and social institutions in response to changing circumstances, we may be well advised to re-evaluate our environmental strategies on a continuing basis for their opportunity costs in terms of economic stability, political stability and ecological stability.

Chairpersons: Herbert Stoevener, Kenneth Farrell, Giuseppe Barbero.  
Rapporteurs: Francisco Amador, Kenneth Thomson, Ewa Rabinowicz.  
Floor discussion: P. Calkins, A. Dubgaard, D. Belshaw, A. Brun, B.J. Revell,  
L.D. Smith, M. Merlo, R. Tiffin, D.R. Shah, T. Engelhardt, G.T. Jones, F.G.  
Mack, H. Jensen, H. Alfons, M. Petit, L. Tweeten, L. Venzi, V. Zachariasse.