INTRODUCTION*

The 1997 IAAE Conference in Sacramento, California, USA, was the 14th that included organized discussion groups. It was the third conference in which some groups were organized as mini-symposia rather than in the traditional format. At this conference, 75 per cent of the sessions were mini-symposia, while at the 1994 Harare Conference 50 per cent were mini-symposia. The leadership for the traditional format groups consisted of a chairperson, rapporteur, and one or more consultants. For the mini-symposia, the organizer made arrangements for a more formal set of presentations prior to the conference.

Attendance for the 24 topics conducted was very good, with more than 500 people participating in the sessions. Each group was scheduled for three sessions of 90 minutes each, on three separate days during the conference. The topics were selected from a list of suggestions obtained from membership responses to a request for topics and interest in leadership in the sessions. The topics selected were the following:

- Water Quality and Markets.
- Agricultural Scientists, Agricultural Economists: How Can They Cooperate?
- Is Agricultural Support Outmoded?
- Trade and Foreign Direct Investment in Food and Agriculture.
- Environmentally Beneficial Agriculture and Rural Revitalization: Perspectives from International Cooperative Studies.
- Global trends in Taste, Preferences and Composition of Food Baskets.
- Approaches to Understanding International Consumer Demand.
- Improving Food Security Through Household, School and Community Gardening.
- Sessions on Sustainable Nutritional Security for sub-Saharan Women Subsistence Farmers.
- What is the Potential for Sustainable Intensification of Fragile Lands? Empirical Evidence and Policy Implications.
- Spatial Economic Models of Land Use: Techniques for the Quantitative Assessment of Land Use Determinants and Environmental Consequences.
- Finance and Factor Market Development for the Rural Poor.
- Role of Rural Non-Farm Activities.
- Rural Financial Institutions for and with the Poor: Relating Access and Impact to Policy Design.

*Larry Sivers (United States Department of Agriculture) organized and reported the discussion groups and mini-symposia.

- The Missing Link Between Agricultural Technology Adoption and Rural Poverty Alleviation.
- Food Quality Regulation in International Markets.
- Agricultural Market Liberalization in Africa.
- Regional Agricultural Trade and Comparative Advantage in Southern and Eastern Africa.
- Improving Higher Education in Agricultural Economics in Transition Countries.
- Agricultural Transition in Central and East European Countries and the Former Soviet Union.
- Future Role of Development Assistance in Agriculture.
- Agricultural Productivity: Multilateral Comparisons.
- Political Economy Analysis in Agricultural Economics: Concepts and Experiences Among Countries.
- Quality and Environmental Management for Competitive Advantage in Agriculture and the Food Industry.

Participants were not asked to register for a session prior to the first meeting, a change from past conference procedures.

Those selected for leadership for the traditional format and the organizers for the mini-symposium were selected from a list of recommendations made by country representatives, the Executive Committee and proposals that came from people proposing mini-symposia. This process resulted in a wide geographical representation in the leadership roles.

Summary reports for each of the topics are contained in the following pages. For the convenience of those who attended meetings the group numbers are taken from the list as originally advertised. Two groups from the latter (2 and 24) were cancelled.

GROUP 1

WATER QUALITY AND MARKETS

ORGANIZERS MAUREEN R. KILKENNY (USA), ROBERT INNES (USA)

RAPPORTEUR MAUREEN R. KILKENNY (USA)

'The defining issue of the twenty-first century may well be the control of water resources. In the next 30 years, it is likely that water shortages will increase dramatically. While water supplies are dwindling because of groundwater depletion, waste and pollution, demand is rising fast. Currently, 338 million people are subject to sometimes severe water shortages, and by 2025 this number is projected to about 3 billion. The worsening scarcity of water threatens agricultural growth and industrial production and is likely to increase water-related health problems and degrade the environment. Policies must treat water, not as a free good, as they often do now, but rather as a scarce commodity that comes at a price' (Pinstrup-Anderson, 'Foreword', to Mark Rosegrant, *Water Resources in the Twenty-first Century: Challenges and Implications for Action*, IFPRI Discussion Paper 20, 1997).

This mini-symposium devoted one meeting to recent research, one to a round table discussion, and one to an experimental market.

Recent research

Mateen Thobani presented 'Formal Water Markets: Why, When and How to Introduce Tradeable Water Rights' (1997), *The World Bank Research Observer*, **12** (2): 161–79. In contrast to the claim that 'water is too precious to be left to markets to allocate it', he contended that marketable water rights increase the efficiency of water use, allow rapid changes in allocation in response to changing demands and can stimulate investment (as in Chile). He insisted that water rights must be separate from land rights. Also the most pragmatic initial allocation is based on existing water use – no matter how unfair or inequitable those patterns may be.

Marca Weinberg extended 'Uncoordinated Agricultural and Environmental Policy Making: An Application to Irrigated Agriculture in the West' (1996), *American Journal of Agricultural Economics*, **78** (1): 65–78. Subsidized (or relatively underpriced) water for agriculture and underpriced effluent both create incentives to overuse water. To correct these two distortions, two

instruments are required: markets to price water correctly and markets correctly to price discharge. Water markets provide economic incentives to conserve water and may thus reduce agricultural effluent externalities.

Reduced drainage in conjunction with unchanged chemical use, however, can lead to increased pollutant concentrations. Jeffrey Connor's model indicates that, although perfectly competitive trade in water allocates water efficiently, the pollutant concentration associated with that allocation may worsen if (1) the value of water in alternative uses is low; (2) small reductions in water use are *not* accompanied by relatively larger reductions in pollutant loading; and (3) small reductions in water use cause large reductions in dilution capacity.

Since geology differs across locations and watersheds, the same farming practices will cause different levels of non-point pollution. Jun Jie Wu described the Regional Agricultural Policy Simulation (RAPS) model: (http://www.ag.iastate.edu/card/divisions/rep/RAPS). The RAPS model uses the United States Department of Agriculture's (USDA) National Resources Inventory detailed information in a geographic information system (GIS) database about land characteristics and farming practices at thousands of points of private land in the United States. A multinominal logit model predicts the allocation of land across crops and chemical use, with respect to government policies and market prices. A region-specific environmental simulation model estimates the environmental consequences of those predicted practices. Jun Jie showed the region-specific changes in cropping patterns and nitrogen run-off across the Midwest due to the changes in US agricultural policies.

Round table

What are the serious water problems? What are the minimum legal or social institutions (or physical systems) needed to support water markets? What are the externalities associated with water use?

David Zilberman argued that the diversion of water to low-value uses is the most serious problem. Agricultural chemical pollution, contamination of water by livestock wastes and waterlogging of soils are secondary problems. Simple solutions are preferable to sophisticated and complex government regulations, which we know always provide opportunities for corruption. He also argued that, if water rights are defined with respect to consumption, externalities associated with return flows are most often positive.

Richard Howitt distinguished rights to water *stocks* from rights to water *flows*. The first is an asset which is very difficult to price and market. Use (flow) rights are easy to price in spot or option markets. Transaction costs for trade in water use rights, however, are difficult to measure. Also there are three categories of externalities: pecuniary, technical and environmental. Citing a recent dispute between water distributors in Southern California, he noted that the ability to convey water is much more valuable than the water itself.

Bill Easter spoke of the key role of water user groups in managing the links between water providers and consumers. On the basis of their survey of water systems around the world, he argued that informal markets (supported by

custom and reputation constraints) are working well. Alternatively, formal markets (supported by legal and government institutions) do not solve corruption problems. Governments still own water; tradable permits only guarantee the rights to use it. He argued that legalizing existing informal markets (for example, in India) may be more effective than imposing formal regulations.

Dr Vaidyanathan, who is sceptical about markets, expressed concern about contingent rights, 'fuzzy' water rights, lack of credible enforcement and the limitations of the conveyance system. Bill Easter noted that, particularly as a result of conveyance limitations one should expect a limited amount of trading in use rights.

Participants provided this list of 'the most serious water problem(s),' by region:

Africa rural access, risk, drinking water quality, ecology, equity;
Armenia scarcity, competing users, transition issues;
Australia rising consumption/declining environment, poorly defined property rights, (un)reliable endowments;
Canada aquatic ecology;
China urban shortage, drinking water quality;
India waste, fuzzy rights, inequities, income distribution;
Japan high cost, quality of drinking water;
South Africa equity/income distribution;
Taiwan scarcity, competing uses, decoupling water from land rights;
Thailand failure to exploit water endowments;
UK urban water shortage, public good aspects;
USA (west) (lack of) conveyance facilities, public good aspects;
(east coast) aquatic ecology;
(corn belt) livestock and agriculture chemical contamination.

Experimental market

Like crop field trials by agronomists, experimental markets are run by economists to investigate the behaviour of people in controlled situations. Maureen Kilkenny ran an experiment to test if/how a tradable pollution permit market (1) substitutes an excludable and rival piece of paper (permit) for a non-excludable, non-rival externality, and reveals the social value of the externality; (2) controls incidence more efficiently than an (ex-post revealed) optimal Pigouvian tax; and (3) allows for more local control of externalities, tailored to each individual producer's technological, cost, price and local citizens' preference structures, while supporting private incentives to adopt abatement technologies.

Each of the 15 participants in the experimental market assumed a well-defined role of a consumer, or one of three different types of producers of a private good. First, a double oral auction revealed the equilibrium market price (and quantity) of the private good; however, some producers generated negative externalities (in the form of paper bags over neighbour's heads). After a 'public choice' to constrain the allowable level of externalities to five (reduced

from eight) by endowing each producer with a permit for one 'unit' of pollution, another double oral auction revealed the value of the externality to be (approximately) the sum of producer and consumer surplus at the margin of five units (as theory predicts).

The third auction (of private goods) showed that, even given the costs of permits, the market price of the private good increased by 13 per cent, compared to the 18 per cent increase under the optimal Pigouvian tax (based on the social value revealed in the second market). Furthermore, only one unit, rather than the permitted five units, of externality was ultimately generated, since many permits were retired by consumers, and less of the private good was sold, reflecting local preferences and income (as well as the effects of too few units of observation in the experiment). Also producers who abated expanded their market share.

GROUP 3

AGRICULTURAL SCIENTISTS, AGRICULTURAL ECONOMISTS: HOW CAN THEY COOPERATE?

ORGANIZER JEAN-MARC BOUSSARD (FRANCE)

RAPPORTEUR SLIM ZEKRI (TUNISIA)

The mini-symposium was organized in two sessions with five interventions. John Dixon from FAO addressed the broad issue of 'Managing Interdisciplinarity in the Public Sector.' He stressed that there are currently a great number of professionals working in the agricultural sector. These professionals are mainly working in commodity or disciplinary organizations, which leads to more specialization of task and methods. On the other hand, he remarked that there are few multidisciplinary rewards to provide incentive for building multidisciplinary teams. The factors enhancing multidisciplinarity are decentralization, strong leadership, proximity to field, ease of communication, clarity of roles and small, long-term teams. Multidisciplinarity should be considered as a complement to disciplinary work. In order to reduce the transaction costs arising from multidisciplinary work, there is a need for common framework, modelling and electronic communications.

C.A.J. Botha, from the University of Pretoria, South Africa, stressed the need of multidisciplinarity for extension service in South Africa. The transition from large-scale farms to small family farms created new challenges. For the most part, the experienced white staff left the extension service and new black people came in with no experience. Scientists are not working together, thus not enough research results are obtained. Money put into the extension system is not adequate and small farmers are not contributing financially. Currently, closing the public extension service is being considered as an option.

Guy Trébuil from CIRAD, France, presented a study of 'Cooperation Between Agronomists and Agricultural Economists to Improve Southeast Asian Agrarian Systems: the DORAS Model in Thailand.' First, he provided a definition of agricultural production systems which he considered as the basis of development-oriented research. The study begins with a preliminary diagnostic stage leading to the planning, division of labour and explanation of the appropriate criteria. The linkages between the institutions, agrarian structures, ecosystem and available technologies are then addressed. Two case studies were later presented. These concerned the coastal rainfed alluvial plain in Southern Thailand and subsistence small farmers in an area of steep land in the upper northern part of Thailand. He concluded that this kind of interdisciplinary

investigation has the potential to generate a specific field of study. The integration of modelling and simulation approaches will be necessary to improve the rapidity of answering farmers' needs under a dramatically changing world.

Guillermo Flichman from CIHEAM, France, presented a methodology based on the use of EPIC as an agronomic model coupled with a mathematical programming model (GAMS). The objectives of this methodology are the study of agricultural and environmental policies in the European Union (EU). This kind of methodology allows the simultaneous tackling of economic aspects and environmental impacts of the changing EU policy. The EPIC model determines engineering production functions as well as potential pollution from agricultural chemicals. The economic and pollution data are later introduced into a mathematical multicriteria model. Results obtained were satisfactory for both France and Spain. The model also included the management of water as a scarce resource.

Finally, Paul Dyke from Texas A&M University presented the integration of agronomic models and mathematical programming at regional or watershed levels. He stressed the fact that it takes years to build a team. He said that integrated natural modelling is a multidisciplinary approach where a great number of disciplines are needed, such as geomorphology, topography, geology, soils, vegetation, land resources, weather, wildlife, reservoirs and ponds. He remarked that in the future the integration of these different disciplines should be done in an additive way. That is, a mathematical model should be designed which would incorporate different models such as salinity, nitrate pollution, pesticides, water shortages and prices. As different periods of time are used in each process of modelling, these models could be simply added to the mathematical model.

GROUP 4

IS AGRICULTURAL SUPPORT OUTMODED?

ORGANIZER JOHN S. MARSH (UK)

RAPPORTEUR JOHN S. MARSH (UK)

Summary

This mini-symposium focused on agricultural policy in developed countries. Its principal conclusions were that:

- traditional arguments for agricultural support are now less valid, and they did not justify intervention in the shape of price policy;
- increased concerns about the environmental impact of agriculture, animal welfare and the quality and safety of food had combined with far-reaching geopolitical changes to change the focus of agricultural policy;
- direct payments to farmers raised questions of legitimacy. The political system had to establish accepted priorities for policy and to ensure that it was delivered efficiently. Agricultural economists had an important role in both areas.

Past reasons for support

These included food security, market stability, improving farmers' bargaining power, counteracting the impact of protectionist trade policies, shielding vulnerable farmers from market pressures and, especially, raising farmers' incomes. The weight attached to these goals had changed but it was strongly argued that, even where they remained important, price policy had shown itself to be incapable of delivering satisfactory solutions. The desirability and feasibility of stabilization was carefully explored. The jury remained out on whether US policy stabilized markets. In the EU, the CAP had stabilized prices to EU farmers but at the expense of increased instability in world markets. The rationality of stability as a goal was questioned. Stabilization at prices which raised farm revenues had increased investment and stimulated surplus production in Europe. The visibility of such surpluses and the cost of dealing with them, together with declining confidence in the ability of governments to manage economies, had undermined the consensus in favour of protection. The status quo was no longer accepted.

Agricultural policy faces new social priorities within a changed economic context

The end of the Cold War, rising income levels in many Asian economies and commitments made as part of the GATT Uruguay Round settlement had resulted in a new global market. Past policy had centred on food production, but now issues relating to public goods and externalities had come to the fore. These included climate change, biodiversity, landscape, wildlife, animal welfare and food safety. Agriculture was no longer the sole motor of the rural economy, and policy had to assist the movement of resources to these new uses. Although, in the mind of many farm lobbyists, market prices remained the most important issue, policy makers faced a new agenda. Evaluating its goals, assessing the cost effectiveness of specific policies and seeking to identify those instruments which were 'least trade distorting' represented a contemporary challenge to agricultural economists. It might be appropriate to abandon a sectoral approach, replacing agricultural policy with policies designed to cope with each type of market failure. The days when ministries of agriculture dominated rural policy may be numbered. There were no obvious or easy ways of directing resources to those uses which were most highly valued. Problems could arise in seeking to encourage the production of public goods. Farmers might perceive an incentive to farm badly if this qualified them for subsidies to change to approved farming systems. The application of the 'polluter pays principle' was impossible where the identity of polluters could not be established or where pollution was the result of the farming activity of past generations. Payments for environmental outputs could not replace revenue lost as a result of lower prices. Farmers' abilities to provide such goods did not match their past levels of production. There was a danger that lobby groups would capture such payments for sectional interests.

New policies had to be politically feasible and economically efficient

Politicians have to consider the cost to them of time spent in promoting policies, the durability of commitment to any new policy, and the extent to which policies would command the continued support of constituents. Market failure was a necessary but not sufficient basis for government intervention. There had to be a clear assurance that the benefits of policies exceeded their cost, including the cost of raising taxes for their finance. Only one voice was raised arguing that past EU policy had been a success. Within the EU there had already been a major switch to direct income payments. These now accounted for two-thirds of the disposable income of French farms. Such support needed to be decoupled. If linked to the provision of environmental goods, long-term contracts would need to be negotiated between farmers' organizations and their governments. The extent to which governments could justify direct payments was questioned. One idea was that they might be made via NGOs, proportionately to money they raised voluntarily. Some politicians might welcome the transparency of such payments. Others would see it as a vice. Farmers, such as those in New Zealand, who saw themselves as part of a commercial economy,

might not welcome such payments. For some participants the question was not how to provide support but how to remove it. The possibility that some semi-public goods could be produced by the private sector was explored and attention was drawn to the relevance of the theory of clubs.[1] Regulations to protect the environment could impair the ability of farmers to compete in world markets. Payments for environmental goods, however, raised difficult trade policy issues. For some they seemed to be the thin end of a new wedge of protection; for others, an essential tool if resources were to be used in a way which reflected social as well as market values. A strongly expressed view was that policies needed to facilitate the provision of public goods but not to 'subsidize' them. Subsidies would result in an excess supply. Agricultural economists face challenges both in valuing public goods and in assessing the efficiency of environmental policies.

[1]See, for example, T.G. MacAulay, 'Games, Clubs and Models; The Economics of an Agricultural Economics Society' (1995), *The Australian Journal of Agricultural Economics*, **39** (1), April.

GROUP 5

TRADE AND FOREIGN DIRECT INVESTMENT IN FOOD AND AGRICULTURE

ORGANIZER STEVE NEFF (USA)

RAPPORTEUR STEVE NEFF (USA)

International food commerce is more than imports and exports. It consists also of foreign direct investment (FDI), licensing of foreign production and other arrangements. Trade and foreign direct investment have both grown faster than GDP for many countries and for the world . This is true for food and agriculture as well as for the general economy. The mini-symposium brought forth a range of perspectives on the globalization of the food economy. What are the sources of globalization: for example, liberalization of trade, deregulation of domestic markets, developments in transport and communication, and the evolution of market capitalism brought about through developments in firm structures and strategies? What are the effects of FDI on home and host countries in terms of domestic resource utilization? The range of issues presented and discussed spanned firm-level decisions to export or invest in production abroad, the role of economies of scale in industries as firms make these decisions, the influence of intellectual property protections and other international trade rules, international investment as a transforming influence in Central European food industries, and the impact of regional integration on food trade and FDI. The first two sessions each had two speakers, while the third had one presentation, allowing ample time for discussion of issues raised by audience members as well as those introduced by the speakers.

Following an introduction of the topic by the chairman, each member of the group gave a brief personal self-introduction including a comment, question or statement of interest in the topic of trade and foreign direct investment. Interests expressed by group members included, among other topics, technology transfer through FDI, effects of outward FDI on the home country's economy, risks associated with FDI (especially from changes in economic policies in the host country), the effects of host country trade restrictions on FDI and the effects of FDI on trade.

Regional integration session

Topic: Food Trade and FDI in Eastern Europe and the European Union
Tim Josling, Stanford University

Regional integration can be accomplished through trade, policy or investment. In the case of the integration of Western Europe with Central and Eastern European countries in transition from state planning, investment appear as the leading force. The presentation focused on three different business strategies for outbound FDI from Western Europe to Eastern Europe: (1) to jump over trade barriers at Eastern European borders and sell food products in the FDI host countries; (2) to invest in Eastern Europe to make food products to sell back on Western Europe markets; and (3) to make products in Eastern Europe for sale in the former Soviet Union. After a review of the data, the third strategy was deemed most important and the second strategy least significant in terms of sales value.

Topic: International Trade and FDI: A CUSTA Case Study
Mary Marchant, University of Kentucky

The speaker presented an empirical study of the relationship between trade and FDI in food industries before and after the Canada–United States Trade Agreement (CUSTA). Econometric evidence favoured a complementary relationship between trade and FDI. In discussion, group members suggested that Canadian supply management policies, such as for eggs, poultry and milk, distort firms' decisions and reduce confidence in results for those industries. A symposium participant emphasized that a change in Canadian investment laws in 1986 may have dampened responses to CUSTA.

Economics of FDI and business strategy session

Topic: Trade Impacts of Economies of Scale in the Pork and Poultry Industries
Maury Bredahl, University of Missouri

There are apparent differences in economies of scale at different stages of the vertical chain of food production. As trade becomes freer, economies of scale effects may become more prominent. Economies of scale at several levels of processing may have different trade implications across countries, depending on the relationship of firm or plant size and the size of the national market. In discussion, group members were curious about whether information on optimal plant size could be inferred from available data, and the speaker was confident that enough information would be available.

Topic: Business Strategies and FDI in the Food Industry
Dennis Henderson, Ohio State University (emeritus)

The presentation centred around nine points related to firm strategies in international commerce, among which were proprietary assets (such as brands), headquarter services such as research and development, early perception of consumer trends, and intra-industry firm rivalry. In discussion, a member of the symposium asked which of the nine points is the most important. The speaker's opinion was that proprietary assets are essential to innovation.

Regional trade and FDI session

Topic: Japanese Outbound FDI in the Food Industry
Mike Reed, University of Kentucky

The presentation focused on patterns of outward investment in the food industry. Some data on total food industry FDI were available since 1970, while other data were available in detail only for 1993. The data tended to confirm that Japanese companies invest abroad with a greater tendency to ship products back to the home market, while US and European firms tend to sell a larger share of products in the host country.

General discussion for the mini-symposium suggested that FDI data are problematical owing to different means of collection, different purposes for data collection, different definitions across countries, short time-series and non-disclosure by governments or companies of data in some cases for confidentiality or other reasons.

GROUP 6

ENVIRONMENTALLY BENEFICIAL AGRICULTURE AND RURAL REVITALIZATION: PERSPECTIVES FROM INTERNATIONAL COOPERATIVE STUDIES

ORGANIZER SHIGEKI YOKOYAMA (JAPAN)

RAPPORTEUR SHIGEKI YOKOYAMA (JAPAN)

Establishing environmentally beneficial agriculture is a global issue. Effective and acceptable policies for less favoured areas is a common concern in developed countries. This symposium incorporated the two issues. Case studies from EU, United States and Japan were presented. Half of them were two-country comparative studies of Japan and another country. Employing similar methodology, these studies showed areas of commonality and differences. The remaining studies reported country-specific cases. The topics covered included farm structure, technology choice, regional resource management, consumer behaviour, marketing and public policies. By exchanging reports on the experience of various countries attempting to develop environmentally beneficial agriculture for rural revitalization, a forum for cooperative research was established.

Session 1

Establishing environmentally friendly dairy farming: Japanese and US perspectives. (Chaired by Al E. Luloff.)

Topic: The Unique Potential for International Cooperation in Grazing Research
Al E. Luloff, Gregory D. Hanson, Penn State, and Shigeki Yokoyama

Family-owned dairy systems in Japan and the United States face similar economic, environmental, and social pressures that threaten their future existence. The common problems, as well as similar topography, climate and dairy production technology, permit a unique international comparison between grazing-based dairy systems in both countries. The economic returns, environmental impacts and sociodemographic characteristics provide similar implications for both countries.

Topic: Towards Differentiating Dairy Grazing Systems in the Northeastern United States
J.R. Winsten, Gregory D. Hanson, Robert L. Parsons, and Al E. Luloff, Penn State

The survey on dairy production practices focusing on grazing intensity was conducted in early 1997 in Pennsylvania, Vermont and Virginia. The intensive grazers were younger, better educated, heavier computer users, were more likely to have written farm plans, and were more satisfied with economic performance and quality of life than others. Use of intensive grazing was the most significant determinant of increasing future reliance on grazing.

Topic: Development of Hokkaido Dairy Farming and Environmental Problems
Hiroki Ukawa, Hokkaido National Agricultural Experiment Station, Japan

Hokkaido dairy farming has long been based on self-supplied feed, while the Japanese livestock industry as a whole depends heavily on imported feed. Enlarging herd size to reduce costs along with increasing dependence on imported feed has led to environmental problems in Hokkaido.

Topic: The Determinant Factors in Adoption of Manure Management among Hokkaido Dairy Farmers: Covariance Structure Analysis
Shigeki Yokoyama, Hiroki Ukawa, Al E. Luloff

Casual relationships among subjective and objective factors on adoption of manure management were examined using covariance structure analysis with data from a survey of Hokkaido dairy farms. Determinant factors in adoption of new manure management included attitude and perception of environmental problems which, in turn, was influenced by source of information and communication. The number of cows per worker and the socioeconomic context of farm location influenced farmers' attitudes.

Topic: Profitability and Expansion of Low-input Dairying in the 'My-pace Dairying' Movement of Northeastern Japan
Yoshihiko Yoshino, Rakunogakuen University, Japan

'My-pace Dairying' is a farmer group aiming at enhancing cow health and farmers' quality of life through reducing farm size. Unique features of their practices are small herd size, low use of concentrates and other purchased feeds, fewer labour hours, more grazing and better manure treatment. Though gross production and yield per cow are lower than among conventional farmers, net income is higher owing to much lower cash expenses. Their commitment to communities and environmental concerns are also high.

Session 2

Regional resource management and environmental policies towards rural revitalization. (Chaired by Gregory D. Hanson.)

Topic: Agritourism as Regional Resource Management in Less Favoured Areas: Japan–Italy Comparison
Yasuo Ohe, Chugoku National Agricultural Experiment Station, Japan; Adriano Ciani, University of Perugia, Italy

Italian and Japanese agritourism were compared. Based on high profitability, Italian agritourism was more likely to be operated on a full-time basis providing year round and diverse services. The potential of indigenous rural development is higher in Italy, reflecting the fact that Japanese rural communities are more stable due to their strong farm background. To respond to increasing and divergent demands for agritourism in Japan, more entrepreneurship is required.

Topic: Environmental Accounting: The Result of Biennial Research and Experience in Italy
Adriano Ciani, Stephan Coocco, University of Perugia

This paper reported on an approach which modified the traditional balance sheet of farming production by considering negative and positive effects on the environment and natural resources. This was illustrated with empirical results from Umbria.

Topic: A Multi-use Sustainable Water Management: Central Italy Irrigation Plan
Antonio Boggia and Gaetano Martino, University of Perugia

This paper examined the various systems of sustainable water use by focusing on irrigation projects which cover Umbria and Tuscany.

Topic: Mineral Surplus in EU Agriculture and Environmental Policies: an Approach at the Farm, Regional and National Levels
Floor M. Brouwer, LEI-DLO, The Netherlands

Mineral balances are important tools for investigating the efficiency of input use and to increase farmers' understanding of management options to reduce nitrogen surpluses. This knowledge can contribute to monitoring progress achieved in agrienvironmental policy and also for monitoring actions to meet the requirements of the EU Nitrates Directive. Two approaches, farm gate balance and surface balance, were presented.

Topic: A Comparison of Less Favoured Area Policies in the EU and Japan
Jaap Post, LEI-DLO, The Netherlands; Yoichi Matsuki, Nippon Veterinary and Animal Science University

Both the EU and Japan have many regions with a long agricultural history of production under unfavourable natural conditions. The necessity of a policy to sustain agriculture in less favoured areas increases with further trade liberalization. The main objective of the less favoured area (LFA) policy in the EU is a continuation of farming in LFA, thereby maintaining a minimum level of population and conserving the countryside. Japanese LFA policy tends to promote agroforestry. In both regions, future LFA subsidies will be more tied to the environment and landscape and less to agricultural production, implying a stronger relation between the approach to production and the level of compensation.

Session 3

Influence of consumer behavior on promotion of environmentally friendly farming. (Chaired by Shigeki Yokoyama.)

Topic: Development of the Organic Fresh Produce Market in Japan
Kazunori Sato, National Agriculture Research Center, Japan

Organic fresh produce marketing emerged during the early 1970s in Japan, responding to increased concern over food safety and farmer health. Currently, marketing channels are divided into the following four types: (1) consumer organizations which have been the major channel from the beginning; (2) supermarkets and department stores, the second largest channel, increasing rapidly; (3) specialist stores, with a small but stable share; and (4) farmers' direct marketing, which is prominent in the suburbs of large cities.

Topic: Issues of Organic Farming Standards in Japan
Taichi Takahaski, National Agriculture Research Center, Japan

There are no standards with legal force on organic farm products in Japan. Currently, the ministry prescribes complicated cultivation guidelines. Moreover, in the stores, many kinds of certificates are used arbitrarily. To avoid this confusion, there is a need for a unified certification system.

Topic: Consumers' Consciousness about Quality of Vegetables and Fruits in Japan
Yuji Oura, Kazunori Sato, National Agriculture Research Center, Japan

The relationship between recognition of environmental problems and purchase behaviour was analysed using a laddering method. The tomato was the crop studied. Consumers recognized 'growing area' and 'cultivation technique' as indices of product safeness.

GROUP 7

GLOBAL TRENDS IN TASTE, PREFERENCES AND COMPOSITION OF FOOD BASKETS

ORGANIZER **BHUBAN C. BARAH (INDIA)**

RAPPORTEUR **BHUBAN C. BARAH (INDIA)**

A group of specialist researchers from 11 countries who have been working in the area of food consumption behaviour participated in this symposium where 18 contributed papers were presented. The symposium was divided into three sections: (1) new frontiers of studies on food consumers' behaviour and conceptualization, (2) case studies, and (3) country experiences and status papers.

The emerging scenario in food consumption has generated global interest. It has also evoked serious interest among scholars for further studies of food consumption trend changes and the various implications for personal, social and global welfare. Income expenditure patterns, poverty and inequality, and the effect of agricultural diversification in the wake of diversification of food baskets are also of interest. The establishment of a global network on food consumption trends is a significant decision.

The pattern of food consumption has been drastically changing globally in recent years. The changes have multiple dimensions and varied implications. Such changes are taking place across social classes, different age groups and over all countries of the world. Older people are happy with social food while the young are fast shifting to modern and varied food. Women and working families have stronger preferences for convenience food, including processed food. Following the basic Engel's Law, the percentage of food expenditure is decreasing and the high-income societies spend a high proportion of their family income on luxury food. This has led to a rapidly rising degree of overconsumption in these nations. In contrast, the low-income countries frequently confront several issues related to deprivation and inaccessibility of food and problems of poverty and inequality loom large. The important paradox is that, while the consumption of cereals in preference to luxury food is declining for the wealthy, the same situation is occurring faster for the poor because of non-availability, lack of purchasing power and entitlement. The problem is so serious that even the consumption of coarse cereals and semi-processed food is affected.

Changes in consumption patterns have brought about interesting questions regarding, for example, what we eat, why we eat, whether all spending on

food is beneficial, how to educate to eat well, the social cost of overconsumption, and the relationship between diversification of food baskets and agricultural diversification. Several methodological questions also arise in this context. There is near-unanimity on issues wherein the role of the economic variable such as income, prices and food availability becomes marginal in the conventional consumption models. In their place, a number of non-economic factors tend to occupy a dominant role. Gender, age structure of population, literacy, knowledge, class composition, food decision makers, quality and method of food production (organic versus chemical, processed or irradiated food), food marketing and advertising are some of important factors affecting food consumption behaviour. Also, in the face of widespread economic reforms, liberalization and international trade, studies on structural changes in the demand–supply scenario for food and feed warrant careful research efforts.

The impact of changes in food consumption behaviour raises several diverse and relevant issues which are regionally crucial and globally significant.

(1) With technological advancement, demand for more caloric energy declines, which reduces the amount of cereal intake, particularly coarse cereal. For example, as the spade is replaced by the mechanical drill for digging a hole, a substantial amount of human body energy is saved and the demand for calorie-rich food is reduced.
(2) Decline in cereal use is compensated for by a variety of non-cereals such as fruits and vegetables, milk and milk products, meat and fish. Thus a new pattern of agricultural diversification may emerge.
(3) Diversification of the food basket leads to agricultural diversification. Grains may shift from human food to animal food. Prime agricultural land is converted to fish ponds, poultry farms, cattle ranching and other livestock activities.
(4) Preferences for processed food derivatives and animal product-based items are increasing significantly. Processed and transformed cereals such as cake and flakes are of lesser nutritional value because vital micronutrients are destroyed in processing and the diet becomes nutritionally inadequate.
(5) Meals eaten away from the home and processed foods are expensive and nutritionally poor.
(6) Younger sections of the population prefer processed variety foods; older people stick to conventional food and less variety. With modern food intake increasing, the market for fast food outlets is spreading aggressively.
(7) Women have a strong preference for convenience food and cooked food. Changing family status (working status) has reduced the liking for home-prepared food, and eating out is becoming popular.
(8) The relationship between overconsumption and a balanced diet is inverse in nature. Overconsumption and variety of food affect health and the increasing diet-related health care cost has tremendous implications for social welfare.
(9) Demand for food is competing hard with demand for feed.

(10) Home-produced food as a social entity is losing ground to the upcoming strong preference for food eaten away from home.
(11) Income/expenditure and price as determinants of food consumption have lost importance, with the non-economic items emerging as major determining factors.
(12) Innovative advertising strategies influence the food consumption pattern, in particular that of the younger consumers.
(13) The issues on poverty (food entitlement versus availability), inequality, deprivation and malnutrition re-emerge and re-enforce the academic debate on calorie versus protein, in more generalized form. The social dimension of food consumption and conflict resolution may gain further importance.
(14) Internationalism and liberalization of food trade warrant more careful examination.
(15) Due consideration to the high social cost of changing food habits and its influence on economic sustainability should be a part of food planning.
(16) The challenging food-related environmental issues require urgent attention.

Regional issues in relation to some of the above are addressed in various degrees, but the global ones are rarely debated. The symposium covered in some detail the issues of various regions and countries.

Conclusion

The problem of food is global in nature, affecting all mankind. Change in taste and preference of the consumers is distinctly visible, not only in the cross-country (horizontal movement) comparison but also in the intra-country experience (vertical movement). The pace of change in the food consumption pattern in recent years is very fast compared to the historical pace, which has puzzled researchers. The implication of these dynamic changes are more perplexing than ever. The wealthy nations face problems of overeating and diet-related health problems, and the other nations confront problems of poverty, inequality and social justice. The variation of food consumption patterns over age group, gender and other characteristics of the population is also observed simultaneously. The problems of food availability, distributional equity, acute malnutrition and deprivation are the typical problems of a large number of poor countries. On calorie intake, the average person in the developed world consumes two-thirds more calories (about 3700 cal per day in 1990 in the United States, up from 3300 cal in 1970) than the average person in the developing world. For example, in sub-Saharan Africa, the total number of people consuming fewer than 2200 calories per day (the poverty line) has increased from 38 per cent in the 1970s to 43 per cent in the early 1990s. The paradox of food consumption is a widespread phenomenon, as seen in a food-surplus rich nation or a food-deficit poor nation. There are approximately 800 million people in the developing world who do not have adequate quantities of food available to them, another quarter of a billion suffer periodically from

inaccessibility to food and, by the year 2025, the number of malnourished people will rise to over a billion. Can such development embrace social justice and the welfare of mankind?

This symposium tried to highlight the importance of regional food issues and touched upon a few international experiences. The academic enthusiasm of the participants on the matters of security of food was extremely high and encouraging. International experiences on food security are illuminating but need more research to understand the dynamics of the modern changes. The participation of highly motivated, committed and very experienced researchers in the symposium contributed greatly to the value of the sessions.

GROUP 8

APPROACHES TO UNDERSTANDING CONSUMER DEMAND

ORGANIZER **DOROTHY PRICE (USA)**

RAPPORTEUR **DOROTHY PRICE (USA)**

Six papers were presented and discussed during the three sessions. The first paper estimated the increases in consumer welfare in Taiwan resulting from a reduction in tariffs in six categories of meat and seafood. Hicksian compensating variation was used to measure the benefits to consumers. Derived compensated demand elasticities were estimated. The effects of various tariff reductions were estimated using a simulation procedure. The estimates accounted for the complementarity and the substitutability among the six commodities, but did not measure the effects of tariff reductions on producers. If tariffs on all meat products were reduced by 10 per cent, the prices on all meat categories would decrease by 7 to 9 per cent, depending on the type of meat. The demand for meats would increase by 4 to 14 per cent. Consumer meat expenditure would decrease by 8.22 per cent. If all tariffs were reduced, consumer meat expenditure would decrease by 18.11 per cent.

The second paper estimated the demand for surirni-based fish products in Japan. Surirni is an intermediate product which is used to make several consumer goods. The primary tool of analysis is the AIDS model, but other methods have been used where appropriate. The results are as yet preliminary, but several hypotheses have been generated: (1) prices of surirni-based products move together because of supply; (2) the demand for kamaboko is high in December because it is used as a gift; (3) the demand for chikuwa and satsumaage is sensitive to weather; (4) food items which have a complementary relationship in Japan are considered substitutes in the United States; (5) substitute and complementary relationships differ among surirni-based products; and (6) income is an important determinant for most surirni-based products. Fish sausage appears to be a Giffen good.

The third paper estimated the effect of habit among five major food categories and among nine fresh fruit products using an annual Japanese retail level time-series data set. Habit is expected in food purchasing behaviour since such behaviour is a low cognitive process, and food is inherently tied to culture. The paper compared results using the State Adjustment Model, the Koyck lag model and the Almon lag model. Habit was significant for meat and cereal products, but non-significant for fruits and vegetables with all models. The Almon model and the State Adjustment Model also estimated a small habit

effect for seafood. Habit was significant for some fresh fruits but not others; structural breaks were a problem with the fresh fruits. Some fruits showed declining popularity over time while others did not.

The fourth paper compared meat safety attitudes and expected meat purchases between US and Japanese consumers. A tri-component attitude model was used to construct the questionnaire. The three components of attitude are: affective (feeling), conative (behavioural) and cognitive (knowledge). The surveys were conducted in Seattle and Kansas City for the United States ($n = 1217$) and in Osaka and Tokyo for Japan ($n = 1149$). The dependent variables are behavioural attitudes measured by categorical responses to the question, 'How do you think your household's consumption of the following foods will change in the future?' The explanatory variables are cognitive and affective attitudes about meat safety, processing food safety, production food safety and regulation of food safety. The affective attitudes include consumer meat preferences and household demographics. An ordered logit model was used for estimation. In general, consumer preferences are important in explaining expected meat consumption. Expected increases in US chicken and fish consumption are driven by concern over the safety of pork. Future Japanese fish consumers feel that fish has a relative safety advantage over beef. Japanese consumers who expect to increase beef and pork purchase also believe that fish is a safe product. *The role of government in ensuring a safe food supply was not significant in any of the models.*

The fifth paper examined the role of Guanxi in doing business in China. Guanxi is a type of social relationship, linking two individuals to enable a social interaction and exchange. Guanxi is egocentric; it is situation-specific and there is no membership or beginning or ending date. Guanxi is different from the social networking in Western society. Social interaction in the West is based on equality, freedom and social interests, while social interaction in China is limited by the hierarchical social structure. In order to do business successfully in China, Guanxi must be built and maintained. Three strategies are suggested: (1) defining what resources one has that can be used to attract others, (2) cultivating personal relationships, and (3) developing mutual trust. All of these strategies must be used with a knowledge of Chinese culture and social interaction.

The last paper presented an overall model for understanding consumers in various societies. The model illustrates factors that affect individuals, families and larger social units in various cultures. Three major environments affect any organizational unit: the macro, the intermediate and the micro. The macro consists of the cultural, the political and the economic environments. Individuals are acted on by these external forces and react to them. In the cultural environment, people learn appropriate behaviour and general attitudinal patterns. The political system makes demands on and regulates individuals, but also benefits them. The economic system determines what and how much will be produced, and how, when and where goods and services will be exchanged. The intermediate environment is a network that links individuals and their families to the elements of the macro environment. One's goals and behaviour are affected by the elements within this environment: roles, resources, needs, values and motivation. The micro environment stems from the intermediate

environment. It includes interrelated linking systems that form behaviour boundaries for individuals or social units. It includes structure, decision making and communication. The use of this model can provide an effective base for working with parties involved in international marketing. It can help in reconciling needs and welfare of importing countries with the profits of exporters. It can help delineate marketing strategies that are universal from those that are regional and/or country-specific.

The overall contribution of this symposium was to provide a broader perspective on consumer demand than is evident in the work done by much of the economics profession. Some of the contributions of other disciplines such as social psychology and sociology were elaborated.

GROUP 9

IMPROVING FOOD SECURITY THROUGH HOUSEHOLD, SCHOOL AND COMMUNITY GARDENING

ORGANIZER ROBIN MARSH (USA)

RAPPORTEUR ANGELA MOSKOW (USA)

Introduction

The panel presented evidence on the costs and benefits of gardening from case studies of community entrepreneurial gardening projects in the United States and home and community gardens in developing countries. A key issue discussed was the financial viability and sustainability of garden projects, as compared with other types of community development initiatives; and the appropriate role of subsidies in supporting garden projects.

The panel addressed the role of gardens in achieving food security goals and touched on criteria for designing sustainable garden projects and programmes, given a variety of objectives (nutrition, income generation, employment, education, empowerment of women).

Laura Lawson, Berkeley Youth Alternatives (BYA)
BYA works with at-risk youth and their families running a landscape crew and the Garden Patch Program. The landscaping work provides employment and on-the-job training for at-risk youth. The Garden Patch Program, started in 1993, includes a children's garden, a demonstration garden, an outdoor classroom, a compost area, an entrepreneurial youth garden and a tree-planting project. Young people who are successful on the landscaping crew have the opportunity to work in the Garden Patch Program to enhance their gardening and leadership skills.

Elizabeth Tan, San Francisco League of Urban Gardeners (SLUG)
Slug employs at-risk youth and young adult interns in a number of community greening and beautification projects on public lands. Additionally, SLUG interns participate in a youth leadership programme on environmental justice issues, create lead-safe gardens, and produce and market Urban Herbals, a line of vinegars and jams made with garden products.

Gail Feenstra, Sustainable Agriculture Research and Education Program (SAREP), University of California, Davis (UC Davis)
Feenstra presented the preliminary results from a nationwide study, conducted in 1996 and 1997 by SAREP, to assess the economic development potential of 28 entrepreneurial community gardens. Gardens were described as entrepreneurial if gardeners sold some of their produce or if the garden employed community residents. The study quantifies the costs and benefits of entrepreneurial garden projects that have pursued economic development strategies, and describes the conditions under which they thrive and fail. Most programmes included in the study were not able to cover all of their costs through the product sales. Nonetheless, they generated significant social and economic benefits for their communities.

Preliminary findings indicate that the most successful gardens have built continuing alliances with local businesses and community organizations. The more stable projects also developed business plans, devoted resources to developing a market plan and focused on high-value crops.

Robin Marsh, United Nations Food and Agriculture Organizations (FAO), Rural Development Division, Rome, Italy
Marsh presented findings from 'Household Gardening and Food Security: A Critical Review of the Literature', a paper prepared for the FAO in 1996. Marsh identified the following food security benefits of home gardening: (1) production of fresh, diverse foods seasonally or year-round; (2) production of nutrient-rich foods otherwise not consumed, or consumed in smaller quantities; (3) income earned from garden sales and/or savings on purchased foods increase cash available for buying staple foods for the family; (4) garden production may become the dominant food source in times of failed harvest or off-farm unemployment; and (5) gardening provides an opportunity for continuing 'hands-on' nutrition education. Additionally, gardening is typically a woman's activity. Gardening enhances women's control over food production and sales, and thus increases the likelihood that household nutrition will improve.

The following guidelines are important in gardens designed to meet food security goals: foremost is building on traditional gardening practices and varieties; work in areas with adequate access to water and family labour for year-round gardening; begin with community organization and nutrition education; involve and train local people to be promoters; be flexible with respect to choice of species and cropping patterns, encouraging diversity and cultivation of indigenous varieties; encourage reliance on local materials for soil and pest management as well as household/community seed production; minimize 'give aways'; and conduct regular monitoring for feedbacks and fine-tuning of project activities.

Angela Moskow, International Agricultural Development Graduate Group, UC Davis
Moskow reported on her master's thesis research conducted in Havana, Cuba, in 1995. Urban agriculture has been promoted in Havana since 1991 as a means of addressing the acute food scarcity problems which developed when

Soviet aid and trade were drastically curtailed. An important component of the government's programme is self-provision gardens, which are cultivated either on private land or on state land which the gardeners are able to use at no cost. It is estimated that Havana now has over 26 000 self-provision gardens.

Moskow determined that the quantity and quality of the food available to households was significantly incremented through garden production of plant and animal products. Furthermore, the gardens had a profound impact on household budgets, through the reduction in weekly food bills and money earned from sales of garden products, with average savings from the garden representing an impressive 40 per cent of the average household income. The study also identified five community benefits: greater food supply, food contributions to community facilities (hospitals, retirement homes), neighbourhood beautification, improved safety and enhanced urban ecology.

Desmond Jolly, Small Farm Center Director, UC Davis

In his paper, 'The Dialectics of Urban Agriculture in the Context of Hunger and Food Access Constraints,' Jolly argued that we need to address aggregate food availability and access for the poor, and the structural issues which bring about food insecurity. Gardening cannot substitute for deficiencies in earning power or the market. Urban agriculture, for the poor, is a defensive option and a 'second-best' policy. And we need to further concern ourselves with whether the role of urban agriculture and local food systems in overall food access matrices can be politically manipulated to mask a net decline in food access brought about by changes in public policies.

Discussion

Subsidy of garden projects Gardening projects, especially entrepreneurial gardens, enable community development and training in a wide range of skills. However, it may not be feasible for market gardens to achieve social goals without consistent and sufficient external support. The evidence suggests that business and market planning are important variables in enhancing market garden economic sustainability. More research is needed to quantify the social contributions and costs associated with market gardens. In the developing country context, often only a small amount of subsidy is necessary to support garden programmes, primarily for initial technical assistance, and gardening offers clear benefits for resource-poor urban and rural families.

Food Gardening is not a panacea for food insecurity, which stems from such factors as landlessness, underemployment, poverty and discriminating policies. However, gardening can be an integral part of a more defined food security strategy at the household, community and national policy levels. The potential is greatest in poor countries. The data from Central America and Asia show that vegetable gardening is strongly correlated with higher household consumption of vegetables, especially among young children who are most vulnerable to malnutrition.

The role of institutional catalyst In gardening projects, both in the United States and in developing countries, there seems to be a need for a strong institutional presence and committed leaders who can rally the community around the gardening efforts. Further, if a project is designed with consideration of the local context, and with substantive community input, its potential for success is greatest. The challenge for the support institution is to successfully transfer responsibility for garden management to the community.

The most successful garden projects rely primarily on local low-cost inputs, with consistent support confined to technical assistance and community capacity building. The utilization of local inputs reduces the dependency created through reliance on give-aways. A city government's stance on using vacant lands for gardening (positive or negative) can also strongly influence (enable or constrain) the potential success of a gardening programme project.

Conclusion

Gardening programmes can meet a number of social and food security needs. It is important, however, to be cognizant of the structural issues which bring about food insecurity when evaluating the benefits and costs of investing in garden projects; and to be realistic about the expected outcomes of gardening projects. Furthermore, the development of garden projects should include input from the target communities, a community capacity building component, technical transfer, business planning (when appropriate), project evaluation and continuing support for governments and private donors.

GROUP 10

SESSIONS ON SUSTAINABLE NUTRITIONAL SECURITY FOR SUB-SAHARAN WOMEN SUBSISTENCE FARMERS

ORGANIZERS SYLVIA LANE (USA), ELISABETH SADOULET (USA)

RAPPORTEURS AGNES R. QUISUMBING (USA), CHRISTINA GLADWIN (USA), ANNE THOMSON (UK)

The three sessions focused on different aspects of the general topic. The first session focused on women's roles as agricultural producers and income earners. Lawrence Haddad reviewed empirical studies which show that income controlled by women has a larger impact than men's income on household food security, child health, nutrition and education. However, Christina Gladwin and Anne Thomson argued that attempts to increase returns to women's resources are constrained by women's roles as food provisioners and preferences for growing subsistence crops. Since income diversification is only realizable in the long run, fertilizer safety nets provided for poor women and expanded efforts to increase women's access to farm and non-farm markets may be more feasible short- and medium-term policy measures.

Agnes Quisumbing reviewed empirical evidence that lower adoption rates of new technologies among female farmers may be due to lower levels of education and landholding sizes rather than to gender itself. However, since women farmers are more likely to copy from other female adopters, female extension agents and contact farmers may be more effective in reaching women. Asymmetric rights and responsibilities within the household may also reduce women's incentives to adopt new technologies.

Michael Kevane presented the work of Tara Vishwanath and her colleagues, who investigated whether women's weaker land rights were related to lower productivity on women's plots in Burkina-Faso. Econometric analysis shows that gender differentials in output and manure use cannot be explained by differences in distance, intensity of prior land use, or inter-household insecurity. However, women in societies with higher divorce probabilities and women with lower status within the household have less productive plots. This suggests that differences in status and bargaining power within the household may have productivity effects.

Sara Tisch discussed the positive effects of a Winrock project involving 150 000 farmers in four countries, with 60 participating NGOs. While participatory approaches were slow to implement, they are responsible for the high

acceptability of the project among farmers and their high initial adoption of new rice technologies. However, the high initial adoption rates dropped after import liberalization led to the flood of cheaper Asian rice; farmers then moved into other crops.

Why was the Winrock project successful? While there was no specific gender focus, and project staff were mostly men, the emphasis on subsistence food crops meant that it was, in effect, aimed at women farmers. Subsequent discussion emphasized the need for anthropological work to inform economic analysis and project design. The discussion also highlighted the need to understand both men's and women's roles in African farming systems, given the diversity of cultures and agroecological conditions.

The second session revolved around nutrition and food programmes. Barbara Schneeman emphasized the need for food-based approaches to reducing malnutrition. Focusing on foods, not just nutrients, such recommendations recognize the complexity of situations in which foods are grown, prepared and consumed. Pre-harvest approaches include varietal selection, breeding and biotechnology, while post-harvest approaches consist of storage and handling, processing, fortification, dietary and lifestyle factors. Improving nutritional adequacy requires input from plant scientists, nutritionists and social scientists.

Charlotte Neumann's presentation dwelt on the nutritional status of rural African women. Lack of access to food, due to low agricultural production and vulnerability to weather risk, is a root cause of protein-energy malnutrition. Malnutrition is also exacerbated by heavy energy expenditures, high fertility, closely spaced pregnancies and infectious diseases. Reduced food intake during pregnancy leads to low birth-weight children, who face greater health risks in their childhood and adult life. Micronutrient deficiencies are also prevalent and may be linked with cultural factors which are biased against women.

Roberta van Haefton discussed US food programmes in Ethiopia, which emphasize supply-side solutions to chronic and transitory food insecurity. The short-term focus of the government is getting food to those who are in need through a grain reserve and food for work programmes. The medium-term goal to reduce the national food gap is being pursued through the promotion of improved seeds and fertilizer, as well as the liberalization of agricultural markets. Livestock income has a higher impact on women's nutritional status, but the link between agricultural production and child malnutrition is weak. Malnutrition is associated with delayed introduction of complementary feeding, morbidity and the absence of water and sanitation facilities.

The discussion focused on the need for a multisectoral approach to reducing malnutrition in sub-Saharan Africa. The expansion of the problem of food security to include nutritional security would not only improve cross-sectoral linkages but would also support food-based approaches. The discussion also highlighted the importance of livestock as a source of income for women as well as animal protein.

Two papers were presented at the third session panel. Barbara McNelly presented the results of an evaluation of Freedom from Hunger's 'Credit with Education Strategy for Improving Nutrition Security' in Ghana, based on its effect on the nutritional status of women, women's economic capacity, health

behaviour and women's status. Kristy Cook presented a paper, written with George Gardiner, on USAID's approaches to nutrition security for African women farmers. This paper discussed the availability of evidence of the impact of USAID's programmes on women, including income changes for male- and female-headed households and women's participation in these programmes. The authors presented the goals and objectives of USAID's programming, noting that a direct focus on rural women's nutritional status would change programme design.

There was considerable discussion of the Freedom from Hunger programme. The supportiveness of the woman's household could contribute to the wide range of observed returns to the credit component. Exploring the possible synergism between the credit component and the education component, as well as their independent effects, was suggested. While there is tension between taking a 'cookie cutter' approach and tailoring programmes to ease specific constraints in particular villages, Freedom From Hunger is constrained to develop programmes which are potentially replicable on a large scale.

While the progress of USAID's Women in Development efforts has been slow, it is heartening to note that indicators on women are now being used in project planning. However, the separation of the AID programme into separate sub-sectors makes progress difficult. A number of contributors pointed out the difficulty of integrating different elements such as nutrition, women and agriculture into one programme, given organizational constraints, exacerbated by recent downsizing in AID.

The session emphasized that farming is only one of the activities that rural women undertake. Programmes should, therefore, be designed and evaluated in terms of how they affect both men and women and the dynamics between them.

GROUP 11

WHAT IS THE POTENTIAL FOR SUSTAINABLE INTENSIFICATION OF FRAGILE LANDS? EMPIRICAL EVIDENCE AND POLICY IMPLICATIONS

ORGANIZERS **SARA SCHERR (USA), JOHN PENDER (USA)**

RAPPORTEURS **SARA SCHERR (USA), JOHN PENDER (USA)**

In recent decades, there have been major increases in rural population and production in developing countries in 'fragile' areas prone to rapid degradation upon disturbance of the vegetative cover. Rural poverty is increasingly concentrated in such areas. This mini-symposium discussed the results of recent empirical studies in fragile environments, addressing three key questions: (1) to what extent did land use intensification takes place over the study period, and to what extent was it associated with land degradation or improvement; (2) what key factors explain observed patterns of resource degradation or improvement; and (3) what are the main implications for agricultural, natural resource and development policy in the fragile lands?

John Sanders of Purdue University presented findings from research with J. Vitale, B. Shapiro and O. Coulibaly in Mali on the role of fertilizer in dryland intensification. He contrasted the Sudanian zones, which is more subsistence-oriented and faces serious challenges of intensification and nutrient depletion, and the Sudano-Guinean zone, where cash crop intensification is leading to organic matter depletion.

Tom Reardon of Michigan State University presented evidence on the determinants of sustainable intensification of agriculture on hillsides in Rwanda, Ethiopia and Tanzania, based on farm survey results from D. Clay, B. Gebremedhin, Z. Semgalawe, S. Swinton and F. Byiringiro.

Stefano Pagiola of the World Bank presented evidence from a nationwide cross-sectional survey with FUSADES of farmer perceptions of erosion and use of soil-conserving practices in El Salvador.

Sara Scherr of IFPRI presented preliminary findings from a survey of 48 communities in the hillsides of Central Honduras, undertaken with J. Pender, O. Neidecker-Gonzales, G. Duron and C. Duarte.

John Pender of IFPRI presented results from a community case study representing the vegetable intensification pathway in the Central Hillside Region.

Abelardo Rodriguez of ICARDA presented a new research project with IRA Medanine in Tunisia and with WRRI in Pakistan on management of flood-prone watersheds.

Bustanul Arifiin of the University of Lampung, Indonesia, presented a regional and national scale analysis of land degradation in upland Indonesia between 1980 and 1991.

Doyle Baker of IITA summarized village survey research on patterns of intensification in the forest margins of Nigeria and Cameroon.

The general discussion raised several key issues.

(1) The dynamics of land degradation and improvement are complex, often occurring simultaneously in different spaces. Little land abandonment was reported for some high-intensity areas in Kenya and El Salvador. In Ethiopia, abandonment was more common, but typically land was brought back into production. The capacity for land recovery has been underestimated. The importance of soil erosion has been overestimated; soil nutrient depletion, compaction, organic matter loss, loss of vegetation and water constraints are usually more important causes of productivity and ecological loss.

(2) Farmers rarely pursue unsustainable pathways from failure to recognize degradation processes. Some farmers are simply too poor to invest or face binding capital or labour constraints. In many situations, land degradation is better thought of as a problem of poverty (reducing the value of the principal assets of the poor) rather than as a threat to agricultural supply. Under other conditions, incentives are insufficient. Research found that farmers did not intensify in Senegal until extensive technologies became unprofitable or in Rwanda until the alternative was abandonment. Opportunity costs of labour or capital may be higher than even well-performing conservation investments. Land-improving practices are more common for commercial, higher-value crops. Evidence on the importance of the farmers' time horizon is mixed.

(3) Policies should focus more on raising the value of farmers' production to encourage land improvement in areas where land use intensity is rising rapidly. Examples are contract farming, government provision of infrastructure, and market institutions to encourage commercialization, including new products. Extension programmes should promote production and conservation jointly, and concentrate on areas where land degradation is both documented and perceived by farmers as a challenge. Factor and product market development influence capacity to mobilize resources for land improvement.

Future research efforts should focus on the following:

- evaluation of development and conservation programmes, which have more impact on land management than most policy instruments;
- understanding how communities manage their local watershed, beyond the adoption of specific farm practices;
- understanding the actual limiting factors for land quality in different environments;
- monitoring soil nutrient changes over time at household and plot levels, with sampling across farm and microwatershed niches;

- documenting different pathways of development over time, for rural communities with different conditions, markets and institutions, and their association with land management practices and land quality outcomes;
- understanding the investment function, how conservation capital accumulates and in what sequence investments are made;
- cross-country research to capture effects of macroeconomic and other national policy variables on land management;
- assessing the 'building blocks' of sustainability, that is, what leads to increased resource use efficiency and reduced losses;
- potentials for rural non-farm opportunities to reduce land degradation pressures;
- documenting patterns and extent of land abandonment, recovery and reuse in intensively managed systems.

Methodology issues were raised. Participants emphasized the need to study the dynamics of land management processes over time, rather than depend only upon cross-sectional surveys. The definition of development pathways needs further resolution. There are measurement issues for land degradation and improvement. Farmers' own assessment of current, past and future land quality can be used in research. Multi-scale methods were used in all of the research presented. Researchers need to concern themselves more with issues of scale; what appears to be degradation on one scale may be neutral or positive on a larger scale. Village surveys offer a promising tool for analysis of intensification and degradation patterns which permit subsequent sampling for more in-depth analysis of priority issues.

GROUP 12

SPATIAL ECONOMIC MODELS OF LAND USE: TECHNIQUES FOR THE QUANTITATIVE ASSESSMENT OF LAND USE DETERMINANTS AND ENVIRONMENTAL CONSEQUENCES

ORGANIZERS GERALD NELSON (USA), KENNETH CHOMITZ (USA)

RAPPORTEURS GERALD NELSON (USA), KENNETH CHOMITZ (USA)

Scope and objectives of the symposium

For many years, quantitative economic analyses of the natural resource and environmental consequences of land use were hindered by lack of data. Since 1994, new data sets and new technologies to manipulate them have opened up new avenues for research. New data sets include land use data derived from satellite images for much of the surface of the earth and a wide variety of geographic information such as elevation, soil type, rainfall, locations of infrastructure such as roads, cities and ports. All of this newly available information is in digital form and amenable to manipulation with geographic information systems software. The use of these large data sets (80 megabytes is a typical file size) has become increasingly feasible as desktop computer capacity continues to double every 18 months. At the same time, land use models to exploit these data sets have been developed. Challenges include spatial autocorrelation, manipulating large files and differences in data availability (large data sets on geophysical parameters, small data sets on socioeconomic information).

This mini-symposium brought together leading researchers in this field and provided conference participants with the opportunity to see the breadth of research in this area. The following list provides titles, abstracts of presentations, where provided by the presenters, and contact information.

Roads, land, markets and deforestation: a spatial model of land use in Belize

Rural roads promote economic development, but they also facilitate deforestation. To explore this trade-off, this paper develops a spatially explicit model of land use and estimates probabilities of alternative land uses as a function of land characteristics and distance to market using a multinominal logit specification of this model. Controls are incorporated for the endogeneity of road placement.

The model is applied to data for southern Belize, an area experiencing rapid expansion of both subsistence and commercial agriculture, using geographic information system (GIS) techniques to select sample points at one kilometre intervals. Market access, land quality and tenure status affect the probability of land being agricultural, and the likelihood of its being used commercially or for subsistence. The results suggest that road building in areas with agriculturally poor soils and low population densities may be a 'lose–lose' proportion, causing habitat fragmentation and providing low economic returns. Contact: Kenneth Chomitz, kchomitz@worldbank.org.

Land use change in Jambi, Indonesia

Policy question: where is smallholder encroachment on logged-over forest most likely to be a problem? This spatial econometric analysis of land use change focuses on the peneplain and piedmont agroecological zones of Jambi province in Central Sumatra. A multivariate econometric model with a binary dependent variable (a probit) was used to control for site-specific biophysical features (fixed effects) and to estimate the effect of distance to rivers and main (asphalted) roads on the probability that logged forest would be converted to rubber agroforests and other land uses by smallholders.

The preliminary results indicate that there was substantial smallholder encroachment on logged natural forests in Jambi between the early 1980s and the early 1990s. The prototype model correctly predicts about 85 per cent of conversion of logged forests by smallholders and about 78 per cent of the cases where logged forest was not yet converted. Site-specific biophysical features are highly significant, indicating that smallholders are selective in their choices of sites for conversion. Smallholder conversion of logged forest is significantly more likely within 10km of main roads, which is consistent with a process driven by market opportunities for profitable tree crops. Contact: Tom Tomich, t.tomich@cgnet.com.

Spatial patterns of deforestation in Cameroon and Zaire

To help elucidate the causes and correlates of deforestation in tropical Africa, this paper undertakes an exploratory spatial analysis of land cover in Cameroon and Zaire. One-kilometre resolution data on land cover is merged in a geographic information system with spatial data on soils, climate, roads and rivers. A data set is generated by taking sample points at 5 km intervals within the area presumed originally to have been covered by rainforest. Using a probit model, the probability that a sample point has non-forest cover (that is, a mosaic of cultivation, secondary growth and forest, or savanna) is related to road and river accessibility, distance to major markets, soil characteristics and local climate. Controlling for agroclimatic conditions, non-forest cover is closely linked to transport access; this relationship is sharper in Cameroon than in Zaire. This may reflect the greater influence of market processes in Cameroon. In Zaire, there is an especially clear link between the presence of agriculturally

suitable soils and the absence of forest cover, suggesting an important link between agriculture and deforestation. Contact: Nlandu Mamingi, n.maming@uwichill.edu.bb.

Using GIS to model rural to urban land conversion: a case study in the Patuxent Watershed, MD

Change in land use patterns in many US regions is characterized by the expansion of a highly fragmented pattern of low-density development into rural areas. The primary features of this phenomenon, sometimes referred to as 'ex-urban sprawl,' are its fragmentation and relative remoteness from urban centres.

Traditional economic models, based on the assumption that employment is located in one or several urban centres, are insufficient in explaining these emerging patterns. Using land use and market transactions data at a highly disaggregated level from a central Maryland region, we estimate a simple alternative model of land use conversion. Results show that, in addition to economic factors, such as opportunity costs and costs of conversion, several landscape pattern and government policy variables are important determinants of land use change. Contact: Elena Irwin, eirwin@arec.umd.edu.

Do roads cause deforestation? Using satellite images in econometric analysis of land use

This presentation was based on a paper of the same title published in the *American Journal of Agricultural Economics*, February 1997. The paper demonstrates how satellite images and other geographic data can be used to predict land use. A cross-section model of land use is estimated with data for a region in Central Mexico. Parameters from the model are used to examine the effects of reduced human activity. If variables that proxy human influence are changed to reflect reduced impact, 'forest' area increases and 'irrigated crop' area is reduced. Additional information on using satellite data in land use models is available at http://www.uiuc.edu/ph/www/g-nelson. Contact: Gerald Nelson, g-nelson@uiuc.edu.

Causes and effects of agricultural intensification: evidence from a case study in Central Honduras

This study explores the dynamics, determinants and implications of agricultural intensification in a study community in Central Honduras using historical recall data collected at the plot, household and community level and secondary data on prices. The community represents a pattern of vegetable crop adoption and intensification common in areas close to urban markets in Central America. Over the past 20 years, production of perishable vegetable crops has grown substantially, as has use of irrigation and chemical inputs, while traditional

production of maize and beans has declined somewhat. Perceived problems of soil erosion have increased, while soil fertility is perceived to have stayed relatively constant. Based on econometric analysis of the historical data, we find that the main factors responsible for expanded horticultural production were road improvements and technical assistance. Population growth did not have a significant effect on the adoption of vegetables, irrigation or chemical inputs, although it was associated with soil erosion and lower soil fertility. Changes in national market prices did not have a measurable impact on adoption of vegetables but did affect irrigation, input use and land degradation.

The empirical findings suggest that horticultural intensification is a mixed blessing for natural resource conditions. It helped to reduce pressure to cultivate marginal lands, but the increase in continuous cropping and use of irrigation appears to have increased soil erosion problems, and use of agricultural chemicals is causing concerns about water contamination downstream. The benefits for farm incomes are a stronger rationale to promote horticultural intensification, and the results suggest the importance of infrastructure development, technical assistance and education to achieve these benefits. Improvements in market prices resulting from structural adjustment policies were not sufficient to bring this about. We believe this study demonstrates the feasibility and utility of using historical recall data to address questions about the causes and effects of agricultural intensification, although some indicators (such as changes in soil fertility) were difficult to collect historically. Contact: John Pender, j-pender@cgnet.com.

Interdisciplinary systems-based analysis for quantitative regional land use evaluation: an application for the Atlantic Zone of Costa Rica

The main thrust of the programme is the development of a methodology for analysis and evaluation of alternative scenarios for profitable and sustainable land use at the farm, (sub-)regional and possibly national level. The farm level refers to a farm household and its resources. Contact: Hans G.P. Jansen, hjansen@sol.racsa.cor.cr.

GROUP 13

FINANCE AND FACTOR MARKET DEVELOPMENT FOR THE RURAL POOR

ORGANIZER RICHARD L. MEYER (USA)

RAPPORTEURS GERHARD COETZEE (SOUTH AFRICA), GABRIEL FUENTES (USA), DOUGLAS GRAHAM (USA)

This mini-symposium consisted of three sessions with two papers in each. The first session, chaired by Hans Binswanger, World Bank, with Gerhard Coetzee, Development Bank of Southern Africa as rapporteur, focused on land markets and financial services. Mark Darroch and Michael Lyne of the University of Natal-Pietermaritzburg, South Africa, explored 'Broadening Access to Land Markets: Financing Emerging Farmers in South Africa'. They sampled voluntary land sales made to disadvantaged people in Kwa Zulu Natal. Only 0.09 percent of the farmland available for redistribution from commercial farmers was transferred to disadvantaged people in 1995 owing to limitations on subdividing farmland and liquidity problems. Recently, mortgage loans with graduated repayment schedules eased this problem, but they are not widely available and their impact is constrained by restrictions on farmland subdivision in the Agricultural Land Act. In the discussion, a consensus emerged that this act must be changed to facilitate broader access to land for disadvantaged farmers.

The second paper, 'Level Playing Fields and Laissez Faire: Post Liberal Development Strategy in Inegalitarian Agrarian Economies', by Michael Carter and Bradford Barham, University of Wisconsin, explored the microdynamics of the export booms of Guatemala, Paraguay and Chile. These booms led to exclusive rather than inclusive growth, emphasizing that getting prices right and property rights well defined is not enough. Small farmers were unable to take advantage of the booms because they are asset poor and rationed out of credit markets. The authors argued that highly focused policy and institutional changes are required to reduce these patterns of inequalitarian growth. In the discussion, some participants argued that focusing only on small farmer land access to fruit farms in Chile is misleading because workers on these farms enjoy increasing real wages and are better off than the small farmers. Others argued that it is necessary also to analyse various paths in the modernization adjustment process and the degree of welfare gains and losses experienced by selected population groups.

The second session, chaired by Paulo Cidade de Araujo, University of São Paulo, Brazil, with Gabriel Fuentes, Loyola Marymount University, California,

as rapporteur, explored technological innovations for increasing access by the rural poor to financial services. Jonathan Conning, Williams College, reported on 'Joint Liability Loans and Innovative Private Sector Financial Technologies in Chile'. He compared the monitoring and transaction costs of joint liability loan contracts with the contracts of individual borrower–lenders and informal money-lenders who borrow to on-lend to other individual borrowers. He showed how joint liability can solve the problem derived from combining the 'monitored lending' and multi-task, principal–multi-agent problem with moral hazard and limited liability. The approach clarifies the conditions when a joint-liability contract will be preferred by borrowers to other contracts. It was agreed in the discussion that joint-liability contracts would be preferred by borrowers when the group monitoring technology offered a decided advantage over the relatively uninformed financial intermediary's monitoring technology. The case study of a Chilean sugar beet firm revealed that early in its history the firm offered joint-liability loans but later it gained monitoring experience and replaced them with other contractual forms. The discussion suggested that the study needed a longer historical record to determine how and when the contracts changed.

Claudio Gonzalez-Vega, Ohio State University, summarized best practice microfinance lending technologies and evaluated their prospects for use in lending to agricultural clienteles. These technologies, short-term loans, frequent repayment schedules, group lending, and graduated loan sizes and term maturities, do not lend themselves to agriculture because there is greater heterogeneity among farmers than among rural and urban non-farm micro entrepreneurs so that screening is more costly. Also there is a greater impact of exogenous events (bad weather, pests and so on) on farmer borrowers, so identifying moral hazard behaviour and monitoring are more expensive. Covariant income losses should also be larger, while the greater spatial dispersion of farmers increases screening and monitoring costs for lenders. The discussion highlighted the need for microfinance programmes serving agriculture to address overall household activities, not just farming; to rely on household income diversification strategies including non-farm and off-farm activities; and to incorporate more flexible repayment schedules. Still, it is likely that any microfinance programme incorporating a sizeable agricultural clientele base will face greater risks and higher costs than urban programmes.

The final session, chaired by Alberto Valdéz, World Bank, with Douglas Graham, Ohio State University, as rapporteur, explored the issue of poverty as a determinant of access to finance. Julie Stanton, Arizona State University, reported on wealth levels and access to finance among farmers in four provinces in Mexico. As expected, wealthier borrowers were heavily associated with private bank finance, but subsidized rate programmes which were specifically aimed to reach low-income, first-time borrowers with modest collateral were also exploited by all wealth levels. These two sources of finance, Banrural and Solidaridad, surprisingly recorded a significant number of borrowers from the two highest wealth quintiles. This finding highlighted the capability of wealthier rent-seeking constituencies to gain access to funding designed for poorer borrowers.

The second paper, by Richard Meyer *et al.*, Ohio State University, documented the degree to which five microfinance organizations in Bolivia reached

clients at or below the poverty line. New data were presented to show how far down the basic needs poverty indicator the new micro lending technologies can reach. The evidence underlined the following: few urban poor are reached by these technologies; these organizations reach clienteles clustered just above or just below the poverty line; and group lending programmes tend to reach a slightly poorer clientele than do those making individual loans. The discussion noted that the poorest of the poor cannot be successfully reached by microfinance programmes, so other policy instruments must be utilized to alleviate poverty.

GROUP 14

ROLE OF NON-FARM ACTIVITIES

ORGANIZER HARBINDERJIT SINGH DILLON (INDONESIA)

RAPPORTEUR BUSTANUL ARIFIN (INDONESIA)

In introducing the topic, the organizer noted that there were currently two schools of thought on the role of rural non-farm activities (RNFA) in agricultural development. The first one holds that the rapid change and the rise in non-farm employment during the 'green revolution' was due to the failure of the agricultural sector in channelling surplus, unbridled population growth and relatively constant real agricultural wages. This deterioration trajectory is often associated with the juxtaposition of high agrarian population growth and densities, stagnant agricultural productivity growth, skewed distribution of access to land and significant numbers of rural households, nevertheless dependent on agriculture. The other school interprets the same phenomena as an indicator of successful structural transformation. The development trajectory is characterized by a relatively egalitarian distribution of land and a low incidence of rural households without access to land but dependent on agricultural production for their livelihood. These two sharply divergent views provided the stage for a lively discussion on the role of technological change, investment in rural infrastructure and enhanced agricultural productivity in understanding the dynamics of RNFA. Presenters were Jung-Sup Choi, Korea Rural Economic Institute, Korea; Mangara Tambunan, Bogor Agricultural University; Ryohei Kada, Kyoto University, Japan.

The major issues surrounding the role of RNFA in agricultural development include promotion of agroindustry, manufacture of farm equipment and machinery, small-scale industries ranging from processing of farm produce to full-fledged textile plants, and agrotourism. The transformation is driven not only by the abundant supply of labour, seasonality and urbanization, but also by the availability and quality of infrastructure. Investment in infrastructure such as rural roads, irrigation systems, communication networks, power, farm-support services, education and health delivery systems has also contributed to the growth in RNFA.

Various forms of rural non-farm activities were highlighted in the course of the discussion. In countries with abundant rural labour, such as Indonesia, Bangladesh and African and Latin American countries, RNFA are often associated with the survival strategies of rural landless labourers. Although RNFA usually involve unskilled rural labourers, this does not necessarily imply a low

level of management capacity and enterpreneurship. The failure of the manufacturing and high-value service sectors to absorb excess labour from agriculture and the slow growth and low productivity of small and medium enterprises have all contributed to the growth of RNFA.

Nevertheless, it was felt that the dynamics and the full potentials of RNFA were not yet fully understood owing to a lack of rigorous research into this topic in most developing countries. The dearth of studies concentrating on migrant movement or the flow of resources from rural to urban areas, both interregional and intersectoral, and those studying consumption and investment in depth was lamented.

Existing statistics indicate that rural income in most developing countries does not originate solely from within agriculture. During the last decade, a higher proportion of rural income has been derived from the service sector, particularly remittances, trading and construction. The issues of non-farm activities in developing countries have moved beyond the labour seasonality towards the utilization and allocation of rural labour. Farm land has tended to decrease over time, even in developing countries in the wake of industrialization. Consequently, average farm size has also been declining. However, in the absence of coherent and comprehensive industrial policies, industries now appear to be scattered all over the rural landscape. In more advanced countries such as Korea, Japan, the United States and Northern Europe, RNFA involve highly skilled farm-based individuals. Furthermore, commercial entities such as agricultural cooperatives, incorporated farm and non-farm enterprises have located some of their more labour-intensive core businesses in rural areas; this is very much evident in Japan and Korea. Japan has also witnessed the rapid emergence of part-time farming. Low-income part-time farming is usually associated with aged labourers and small farms, whereas higher-income part-time farming is related to young individuals with larger farms who have managed to secure high-paying urban jobs as well.

The role RNFA play is based on the economic rationale underlying household labour allocation strategies. Investment in farm equipment and agriculture support services also led to progressive rural transformation in most developed countries. In addition, RNFA have also functioned as risk-spreading strategies, since full-time farming is inherently more susceptible to shocks. Recent evidence shows that RNFA serve to generate greater stability in rural employment, as these activities also absorb an amount of disguised unemployment in rural areas.

Developed countries such as Japan and France have seen strong pressure from farmers and agricultural cooperatives for continued government support. However, implementation of the Marrakesh Accord in full should serve to mitigate such pressure in the near future. One key factor explaining the shape of RNFA in developed countries is the high income obtained from the industrial and service sectors. In addition, a more transparent and better-defined industrial development strategy has helped strengthen the role of RNFA in these countries. Zoning restrictions on conversion of farmland to industrial use and a very large tax on such conversion has also contributed to the strength of agricultural and rural sectors, including RNFA, in a number of developed countries.

The symposium participants felt that RNFA could play a major role in alleviating rural poverty. In this respect, it noted with satisfaction a number of policy reforms in developing countries surrounding the ability of local governments to promote investment in rural areas, to provide quality secondary education for rural youth and to reassess the city-based and capital-intensive nature of their industrialization strategies. Besides the initial investment by the government in infrastructure and other employment-generating activities, the symposium called for larger funding and a more research-focused agenda for the role of RNFA in agricultural development.

GROUP 15

RURAL FINANCIAL INSTITUTIONS FOR AND WITH THE POOR: RELATING ACCESS AND IMPACT TO POLICY DESIGN

ORGANIZERS MANFRED ZELLER (USA), MANOHAR SHARMA (USA)

RAPPORTEURS MANFRED ZELLER (USA), MANOHAR SHARMA (USA)

Summary

The objective of the symposium was to discuss policy options in providing rural finance for and with the poor in the light of empirical evidence collected so far on (1) the nature of access of the poor to existing financial institutions and (2) the impact of such institutions on their livelihood and welfare.

Session 1

Chair: Tracey Simbi, Ministry of Agriculture, South Africa. Presenters: Susan Lund (McKinsey Consulting Group), Marcel Fafchamps (Stanford University), Franz Heidhues, Gertrud Schrieder and Belle-Sossoh (University of Hohenheim). Discussant: Anand Swamy (University of Maryland).

Lund and Fafchamps, as well as Heidhues *et al.*, showed how small groups of people can collectively obtain access to credit. Fafchamps and Lund showed how this can be done informally, whereas Heidhues *et al.* analysed more formal group lending schemes. Lund and Fafchamps' study of four villages in the northern Philippines tested for pareto-optimal risk pooling at the village level. They reject this hypothesis but find that risks are shared within smaller networks of relatives and friends. Within these networks, risk sharing takes place through repeated informal transactions based on reciprocity, and mutual insurance takes place through a mix of gifts and no-interest loans. However, they find that more observable shocks such as illnesses are better insured than less observable ones such as unemployment or crop loss.

Heidhues *et al.* compared transaction costs of two group lending schemes and one individual lending scheme in the Cameroon. These costs were analysed at three levels: the financial organization level, the group level and the borrower's level. They found that transaction costs are the lowest in individual lending and highest in group-based lending. However, they caution against

misinterpretation of this result, as the client bases in the three programmes are quite different. The higher transaction costs of the group-based programmes may well be the result of the higher cost of screening and monitoring more risky clients as well as other factors.

Session 2

Chair: Monique Cohen (USAID). Presenters: Anjini Kochar (Stanford University), Aliou Diagne (IFPRI). Discussant: Anna Paulson (Northwestern University).

Papers by Diagne and Kochar discussed the impact of access to rural financial services on household income and welfare. Diagne argued that amount borrowed is not a good measure of access to credit as individuals and households often do not borrow to the full extent of their credit limits. Using data on credit limits and credit transactions from Malawi, he showed that this was the case both in the formal and the informal sectors. Using credit limit as a measure of access, Diagne found that formal credit programmes reduce households' dependence on informal credit but, apart from that, have little impact, direct or indirect, on household income, food security and nutritional status of credit programme members. He concluded that access to land and the availability of market infrastructure are the most constraining factors on per capita household income. Returns to credit services, therefore, importantly depend on the access and use of these complementary inputs. Furthermore, return to credit services was low in the two survey years owing to drought.

Kochar used a panel data from Pakistan to examine the effects of income uncertainty and anticipated changes in income and health on the saving patterns of households. She found that ill-health, especially that of young males, is far more likely to contribute to poverty through adverse portfolio shifts than is either anticipated change in income or income uncertainty. This was the case for both intergenerational and nuclear households. She also found that, while intergenerational households are able to increase saving in response to an anticipated reduction in work days due to illness, nuclear households appear unable to do so. Nuclear households, therefore, were more likely to use informal credit to protect consumption from episodes of illness. Given the importance of illness in affecting saving decisions of households, Kochar concluded that improvements in health infrastructure are likely to have a substantial impact not just on improved health but also on income levels.

Session 3

Chair: Mahabub Hossain (International Rice Research Institute). Presenters: Julia Paxton and Carlos Cuevas (World Bank), Jacob Yaron and McDonald Benjamin (World Bank). Discussant: Zhu Ling (Chinese Academy of Social Sciences).

Paxton and Cuevas, as well as Yaron and Benjamin, discussed policy/programme options in rural finance. Paxton and Cuevas compared the performance

of village banks and credit unions in a number of countries in Latin America. The two offer different financial products to different target groups: while the village banks concentrate on the very poor, the women, and the uneducated, credit unions have a much more heterogeneous client base consisting of both the poor and the non-poor. In addition, credit unions also provide voluntary microdeposit instruments. The analysis of Paxton and Cuevas indicated that, compared to the credit unions, village banks scored higher on outreach but lower on measures of financial sustainability, suggesting a possible trade-off between outreach and financial sustainability. However, they argued that this may not necessarily be so, since village banking is a relatively newer lending methodology and that experience, innovations and economies of scale will strengthen its financial status in due time.

Yaron and Benjamin reviewed recent international experiences in rural financial development. They suggest that new policies for strengthening rural financial markets aim at improving the macroeconomic environment, removing urban-biased policies and introducing legal and regulatory changes affecting financial transactions. They also stress the need for adopting sound performance criteria based on measures of outreach as well as financial sustainability to evaluate financial institutions. They argued that, with these kinds of measures, not only can financial services be provided to low-income rural clients at lower costs, but they can also be provided in many cases while reducing or even eliminating the need for subsidies.

The session concluded with a joint meeting with the participants of a concurrent mini-symposium on 'Finance Factor Market Development for the Rural Poor', where remarks summing up were made by Manfred Zeller and Douglas Graham (Ohio State University). One overall conclusion was that further research leading to a better understanding of the institutional processes of microfinance would be instrumental in coming up with new methods of financial intermediation that reduce the trade-offs between outreach to the poor and financial sustainability.

GROUP 16

THE MISSING LINK BETWEEN AGRICULTURAL TECHNOLOGY ADOPTION AND RURAL POVERTY ALLEVIATION

ORGANIZER GANESH RAUNIYAR (NEW ZEALAND)

RAPPORTEUR JILL FINDEIS (USA)

Rural poverty remains a persistent problem, particularly in developing countries. While much research has been conducted on the characteristics and causes of rural poverty as well as on policies to alleviate poverty, one issue that is not well understood is the role of the new agricultural technologies in reducing the poverty problem. The four presented papers and discussion by participants in the mini-symposium focused on the issue of the missing links between agriculture and poverty alleviation.

The symptoms of rural poverty are clear: a poor living environment, a poor resource base, unemployment and underemployment of resources including human resources, and inadequate food production and consumption, among other problems. The causes of poverty are also well known and include lack of economic opportunities, low levels of human capital, and social and political instability. Strategies to alleviate rural poverty have included a variety of approaches that have met with varying degrees of success. Common programmes include integrated rural development programmes, rural credit, food for work programmes, programmes to encourage diversification of agricultural households into off-farm work and microenterprise development, market reforms and development programmes designed using the local participatory approach.

But do missing links exist that deserve more attention? The four presentations in the mini-symposium focused on possible links that are not recognized or not well understood. The chairperson and organizer of the mini-symposium, Ganesh Rauniyar, initially reviewed the symptoms and causes of poverty and strategies to alleviate poverty. Potential missing links that were identified in this presentation included gender roles, access to service delivery institutions, (excessive) emphasis on credit as an instrument without fully recognizing minimum thresholds for household consumption requirements, lack of technologies suitable for smallholders who often have different resource endowments, and the role of off-farm income in access to and utilization of technologies. For agricultural households, barriers to technology adoption on small farms still exist and limit the extent to which many agricultural households can enhance their incomes through the use of the new agricultural

technologies. One particularly problematic issue emphasized in the Rauniyar presentation is the operation of agricultural credit programmes to enable households to adopt new technologies or develop other income-enhancing enterprises. Agricultural credit programmes are often based on the assumption that credit is used for productive investment. In practice, the population in poverty tends to allocate production loans (at least partially) for consumption and energy needs.

Issues identified by the other papers presenters as missing links included (1) lack of sufficient knowledge regarding the welfare effects of the agricultural technologies on society as a whole, as well as for different sectors or groups, (2) lack of understanding of the direct and indirect impacts on rural labour, and (3) lack of development of markets. While the principal goal of the new agricultural technologies is to improve human welfare, two issues arise. First, the new technologies may serve to improve absolute welfare measures, but increase the relative welfare differences between the higher income groups, more able to adopt and utilize the new technologies, and households in poverty. Second, there may even be absolute declines in welfare, particularly for certain sub-groups of the rural population. Many studies of the new agricultural technologies have focused on adoption decisions and the returns to agricultural research. Suggestions for further research to understand better the welfare impacts of the new technologies include insertion of explicit welfare measures into models of technology adoption, explicit consideration of dynamics, and integration of technological change into multi-market analyses (including financial markets and labour markets).

Furthermore, it was pointed out that the effects of the new agricultural technologies on rural labour markets are generally not well understood. Since households in poverty are typically dependent on wage labour, the indirect effects of agricultural technology adoption on hired farm labour and off-farm (non-agricultural) labour markets are particularly relevant. Additional research is needed on, first, the long-run effects of the agricultural technologies on hired farm labour markets, both for agricultural products enhanced by the technologies (such as rice, maize and wheat) and for secondary crop and non-crop farm enterprises, and second, the long-run effects of the agricultural technologies on local agricultural processing employment and wages.

Finally, the important role of further development of efficient markets in rural areas was emphasized. Without access to markets for different agricultural enterprises, even poor farmers able to use the new technologies are unable to benefit. One aspect of this issue that generated much discussion by the mini-symposium participants was whether or not access to efficient markets was a necessary and sufficient condition for alleviating poverty among poor farm households.

The discussion during and following the presentations focused on the missing links identified by the presenters as well as on other possible missing links identified by the mini-symposium participants. The mini-symposium concluded with plans to establish a network to examine further the technology–poverty issue.

GROUP 17

FOOD QUALITY REGULATION IN INTERNATIONAL MARKETS

ORGANIZERS **JULIE A. CASWELL (USA), TANYA ROBERTS (USA)**

RAPPORTEUR **JULIE A. CASWELL (USA)**

The purpose of this session was to compare and discuss the role economic analysis plays in the design of food quality regulation, with an emphasis on regulation of food safety and food labelling. We also focused on the impact of this regulation on international trade in food products. We divided our discussion into the subject areas of (1) food safety regulation in international meat product trade, and (2) food standards, certification and labelling issues. Governments frequently use a combination of input, process and product performance standards to ensure the safety of meat and other food products. In contrast, certification and labelling programmes are frequently used for food attributes such as nutritional quality, region of production and processing method.

Laurian Unnevehr (University of Illinois) led the discussion on food safety regulation in international meat product trade. She noted that, as incomes rise throughout the world, demand for meat products is growing, and so is international trade in these products. Two kinds of risks from this trade are subject to sanitary regulation. Animal disease risk through trade in live animals or products is one kind of risk that is becoming more important as trade volumes grow. The second kind of risk is from microbial pathogens in meat products that cause food-borne illness. As consumers become more wealthy and more informed about the links between diet and health, they demand a higher level of safety from food products. These trends are converging to make sanitary regulation an issue of growing importance in the trade of meat products. The 1994 GATT agreement provides new guidance regarding sanitary regulations and the application of transparent, science-based border measures. Governments around the world are trying different approaches to regulating food safety in domestic and international trade.

Unnevehr discussed the move towards newer process certification approaches to insuring food safety, such as hazard analysis critical control point (HACCP) systems. In the United States, major regulations such as the recently adopted HACCP rule for meat and poultry must be subjected to benefit/cost analysis. This analysis, and consideration of the economic incentives of new rules, played an important role in the final form of the HACCP rule.

Kenneth Forsythe (USDA/APHIS) then discussed the process that the Animal and Plant Health Inspection Service of USDA is using to make regulatory decisions regarding animals and animal products, particularly quarantine decisions. In setting up a programme that is responsive to WTO requirements, APHIS has shifted from using a blanket approach which categorizes animals or products from specific geographical regions as acceptable for admission to the United States to using a case-by-case approach that weighs the benefits and costs of allowing import of specific animals or products. He noted that the SPS Agreement under the WTO does not specifically say whether or how economic costs must be evaluated in making regulatory decisions.

Takuji Sakurai (Shiga Prefecture Department of Agriculture, Forestry and Fisheries, Japan) discussed the scope and effects of recent outbreaks of foodborne illness in Japan. His presentation indicated that problems with *E. coli* 0157:H7 have been evident for some time in Japan but recent outbreaks of illness have greatly increased concern. The Japanese and local governments are taking a number of actions to improve safety assurance, as well as conducting programmes to inform consumers on safe food-handling practices. The discussion that followed focused on the operation of regulatory systems and the extent to which economic analysis does or does not play a role in policy formulation.

The second area the discussion group focused on was food standards, certification and labelling issues. This approach is frequently used for food quality attributes that are not safety-related. Julie Caswell (University of Massachusetts) introduced the topic area noting that labelling is backed up by standards and certification programmes that define the labelled attributes. Labelling's main roles are to change the information environment for consumers by increasing the amount and type of information they have about products and to influence companies' decisions on which product to offer for sale.

Jean-Christophe Bureau (INRA-Station d'Economie et Sociologie Rurales, France) led the discussion by describing and analysing the use of labels for quality attributes such as place of origin and production method in the European Union. He noted that several labelling schemes coexist, qualifying for particular labels is often complicated and imported products usually may not qualify. The labelling schemes may be becoming too complex for consumers to use effectively, weakening the labels' impact and increasing the importance of brand names. Discussion focused on what role government should play in supporting various labelling schemes whose main impact may be to provide protection to certain production interests, while at the same time, perhaps, protecting traditional foods and production practices. Stephan Marette (INRA-Station d'Economie et Sociologie Rurales, France) discussed the trade impacts of the quality labelling schemes. He thinks their trade impacts are minor because the labels are not exclusive and other sources of information, such as brand names, play important roles in consumers' choices.

Caswell discussed the use of labelling for nutritional quality in the United States. The inclusion of a nutrition information panel has been mandatory for nearly all food products since 1994. In addition, the use of voluntary nutrient and health claims such as 'low fat' and 'reduced sodium' is strictly regulated. The labelling programme has been effective in improving the amount and

quality of nutrition information available to consumers. Discussion of standards, certification and labelling programmes focused on the great variety of these programmes across countries; which attributes should be the priority of government-sanctioned programmes; and the impact of labelling on markets for consumer products.

The discussion group identified several contributions economists can make to regulatory decisions for food products: analysis of market imperfections and failures (rationales for regulation); analysis of programme effects on demand and supply; estimation of national-level benefits and costs; an economic overview of risk management strategies; and analysis of the trade impacts of regulatory policy.

GROUP 18

AGRICULTURAL MARKET LIBERALIZATION IN AFRICA

ORGANIZERS **RAISUDDIN AHMED (USA), STEVEN BUCCOLA (USA)**

RAPPORTEUR **STEVEN BUCCOLA (USA)**

In the first session, Steven Buccola discussed progress under way in Malawi to privatize smallholder coffee marketing. He recounted strategies the government-owned Smallholder Coffee Authority has used to resist the government's move to eliminate agricultural parastatals. Strategies include alliances with key ministry personnel, delays in issuing required memoranda and farmer misinformation campaigns. Buccola pointed out that the Coffee Authority's costs have been extremely high relative to the quantity of coffee they have purchased from farmers. The model he proposed to explain these costs is that a marketing board naturally seeks to *maximize* its marketing costs subject to the restriction that net losses do not exceed the limit imposed by the government and donors, and that the quantity supplied by farmers be a function of the prices the marketing board offers. He outlined a set of first-order conditions that can be used to test the model. Raisuddin Ahmed commented that thin markets and natural monopolies are a common problem in Africa, and that the principal solution is to integrate markets by reducing transport and transactions costs.

Glenn Rogers discussed regional markets for illicit payments to public agents along roads in West Africa, using 10 years of data from Niger, Burkina-Faso and Côte d'Ivoire. A model of optimal demands for illicit payments suggests that public agents who ask for these payments do respond to market incentives but sometimes extract the payments excessively, causing the market to collapse. National governments have reduced legal trade taxes to promote exports, but illicit payments have increased, partly offsetting the benefits of market liberalization. This encourages governments to reimpose legal trade taxes. Increased transparency and provision of information, in combination with increased enforcement of regulations, has temporarily reduced illicit payments. However, greater competition in the market for these payments will be required to sustain significant reductions in the payments, enabling more rapid economic growth in West Africa. Eric Crawford recommended further examination regarding who bears the cost of the illicit payments.

On the second day of the mini-symposium, Michael Kevane and Leslie Gray discussed the effects of land tenure security and ethnicity on manure and fertilizer use in Burkina-Faso. They reported on a two-period profit maximization

model of manure and fertilizer demand, estimated using cross-sectional data. The strongest determinants of manure and fertilizer demand are the plot's productivity potential, slope and distance from the household. The effects on manure use of the farmer's ethnicity and strength of claim to the plot were weaker than were the distance and slope effects. The first discussant, Jayashree Sil, questioned whether tenure status and ethnicity are the principal issues in manure use and whether the effect of crop mix is not more important. She also criticized the model's assumption of perfect input substitution. The second discussant, Will Masters, suggested that better proxies be used for the household's labour abundance, real wage and implicit consumption discount rate.

Marcel Fafchamps reviewed his thesis that the emergence of markets in a newly liberalized environment depends upon the process whereby a potential trader gathers information about other potential market participants. The main way he does so is to engage in initial exchanges to test a potential partner's reliability. The easier it is to engage in these initial exchanges, the less costly it is to gather the information sought and, thus, the more quickly the market becomes efficient. Fafchamps employs parameters representing screening costs and the proportion of 'competent' to total traders known to a given agent. Among other things, he shows that trades between anonymous individuals – in which neither partner knows anything about the other – are impossible. Facilitating information flows about the traders' histories, therefore, becomes crucial to improving market efficiency. Jayashree Sil commented that the policy implications of these results would be improved by characterizing the magnitude of screening costs relative to the potential gains from trade. Will Masters asked why some markets are full of competent traders while others are not and suggested that we pay attention to the parameter values that lead to such results.

On the third and final day of the mini-symposium, Francesco Goletti (delivering a paper of his with Mylene Kheralla) reviewed the response of input markets to liberalization in five African countries: Malawi, Ghana, Benin, Senegal and Madagascar. His presentation results from an extensive random survey of farmers and input traders. Principal inputs included in the survey were fertilizer, seed and credit; principal farm commodities were maize and rice. Much of the survey concentrated on the intensity of use of these inputs and the reasons farmers and traders give for levels of use. For example, only 10 per cent of Madagascar rice farmers have access to credit; the main reason given for failure to obtain credit is the height of the interest rate and the requirement of forming a cooperative loan association. In the other countries studied, similar reasons were given for failure to obtain credit. Overall, Goletti finds that liberalization has had some success in the cash crop sector but has not been as successful in the food crop sector. In his comment, Buccola pointed out that this result is consistent with the fact that pre-reform regulatory regimes tended to subsidize food crops at the expense of cash crops.

Eric Crawford (in a paper written by Thom Jayne, John Staatz, Michael Weber, Stephen Jones and himself) discussed a reduced-form econometric model of productivity growth rates in seven African countries. Productivity growth was measured by value of crop output per hectare. The explanatory variables were farmer-to-land ratio, rainfall, fertilizer-to-land ratio, a warfare

dummy variable in two countries and a reform dummy variable. The authors find that structural reform improved productivity growth in five of the seven countries examined. Much of the improvement has come about because of increased use of fertilizer and because of a reform-induced switch to higher-value crops. In some cases, especially in East and Southern Africa, reform has, however, led to reduced fertilizer use following the removal of fertilizer subsidies. The authors say that a key policy objective now should be for governments to help reduce marketing costs by investing in road and communication infrastructure, further liberalizing the policies of existing marketing boards and improving provisions for contract enforcement. In his comments, Buccola suggested recasting the reduced-form model as a profit-function model in which the dependent variables are rainfall, the reform dummy variable, and border prices of products and inputs.

GROUP 19

REGIONAL AGRICULTURAL TRADE AND COMPARATIVE ADVANTAGE IN SOUTHERN AND EASTERN AFRICA

ORGANIZER RUVIMBO CHIMEDZA (ZIMBABWE)

RAPPORTEURS EMMANUEL ACQUAH (USA), BRIAN D'SILVA (USA)

The mini-symposium included participants from at least 10 East and Southern African countries who are involved in the 'Regional Trade Analytical Agenda for East and Southern Africa', which is being funded by USAID.

The opening theme was 'The Policy Environment, Trade and Transport Issues in East and Southern Africa' and was chaired by Dr Ruvimbo Chimedza (Zimbabwe). The initial presentation focused on 'The Overview of the Program of Work for the Regional Trade Analytical Agenda' by D'Silva and Carvalho of USAID. Emphasis was placed on the theme of the agenda which was 'From Analysis to Policy Change Through Dialogue'. The manner in which the agenda was developed was discussed, as well as the major thematic areas: policy change in trade and agriculture; reduction of transport costs; estimates of unrecorded cross-border trade in East and Southern Africa; and changing agricultural comparative advantage in Southern Africa. Participation of researchers, policy makers and policy analysts from the region was emphasized in the sessions, with 22 East and Southern Africans involved in implementation of the agenda participating with presentations in this mini-symposium.

'Changes in the Policy Environment in Trade and Agriculture in the Greater Horn of Africa' was presented by Professor N'Geno (Kenya). Emphasis was placed on the pace of reform in different countries as well as the impact of civil strife on achievement of objectives related to reforms. All of the Greater Horn of Africa countries except Somalia were covered in this report. The Southern Africa report was presented by Professor Van Rooyen (South Africa). The approach taken in Southern Africa was different, in that key researchers and policy analysts in each of five countries were asked to analyse the structure of reform and look at anticipated reforms in the future. Countries covered were Zimbabwe, Zambia, Malawi, Mozambique and South Africa. Then a cross-country synthesis was developed. The in-depth knowledge of country researchers was highlighted in this process. Subsequent to the completion of the report, the SADC free trade protocol was signed as a way of encouraging regional integration in the region. Efforts will be made to expand coverage of this report to all of the SADC countries.

In the Greater Horn of Africa, the issue of transport costs as an impediment to regional trade and food security was highlighted with the presentation of results from two studies: one on East Africa and the other on the northern tier of the Greater Horn. These two studies were conducted by Anyango (Kenya) and reported on by Nimrod Waniala (Uganda). The studies showed that between 50 and 70 per cent of the c.i.f. costs of imports for landlocked countries in the region were related to transport costs. As a result of these analyses, a process is now in place where the recommendations from the studies are being implemented by bodies in the region. Key to the dialogue and implementation of the findings is a group called the East African Transport Initiative which is working with national-level policy makers in implementing policy reforms which will lead to reduced costs of transport in the region.

The second day of the mini-symposium focused on 'Unrecorded Cross-border Trade in East and Southern Africa: Implications for Food Security'. Chair of the session was Nimrod Waniala (Uganda). The overview of the programme of work which started in 1995 and the development of the methodology was presented by Chris Ackello-Ogutu (Kenya). For each of the sites that data were reported on, monitoring had taken place over a 12-month period. Results were then presented from monitoring of the different sites, beginning with the Kenya/Uganda border by Protase Echessah (Kenya); Tanzania and its neighbours by Echessah (Kenya); Malawi and its neighbours by Isaac Minde (Malawi); Mozambique and its neighbours by Jose Macamo (Mozambique). Future plans are to cover Zambia and its neighbours and Ethiopia and its neighbours in 1998. The overall results showed the magnitude of unrecorded trade in both agricultural and non-agricultural commodities. Food commodities were dominant in trade across the Kenya/Uganda border. Agricultural inputs like fertilizer, petroleum products and used and new clothes were also traded in large quantities. Similar to the work on transport costs, the next phase of this activity involves the setting up of regional groups who will utilize the data for dialogue with policy makers on the importance of informal unrecorded trade in meeting food and non-food needs, especially in border areas. Transport and comparative advantage issues were seen as key factors in determining both the direction of trade and the magnitude of unrecorded trade.

The third day of the mini-symposium focused on results from the research on 'Comparative Advantage in Southern Africa: An Agro-ecological Zone Approach', Glenn Magagula (Swaziland), who coordinates all of this work, chaired the session and described the overall organization of the research. Country teams are currently undertaking country-level work in seven countries in Southern Africa. The unifying methodology being utilized by all seven countries was presented by Rashid Hassan (South Africa). This methodology utilizes GIS techniques to link spatially data and analyses within each country. Country-level results were presented by Johan Van Zyl (South Africa), Hamid Faki (Swaziland), Teddy Nankhumwa (Malawi), Firmino Mucavele (Mozambique), Faustin Mwape (Zambia) and Chrispen Sukume (Zimbabwe). The next steps are for the regional analyses to be completed by early 1998, which will link all of the country-level work.

Discussion on all three days was excellent. Recognition was given to the fact that this capacity-building exercise is not only making a major effort at produc-

ing significant research results and capacity but is also making important contributions to the role of research in policy dialogue in the region. Consequently, it fits very well into the principles of USAID's Greater Horn of Africa Initiative and the Initiative for Southern Africa, which expects people from the region to provide the leadership in both identifying and analysing problems and their solutions. In addition, the topic of regional trade and food security was important, not only for East and Southern Africa, but for all of Africa.

GROUP 20

IMPROVING HIGHER EDUCATION IN AGRICULTURAL ECONOMICS IN TRANSITION COUNTRIES

ORGANIZER KLAUS FROHBERG (GERMANY)

RAPPORTEUR KLAUS FROHBERG (GERMANY)

The discussion was divided into three parts: (1) what kind of qualifications do agricultural economists need for their employment in transition countries; (2) how can this demand be met in terms of curricula and teaching methods; and (3) what kind of assistance from Western countries is expected and also necessary?

The profile required of agricultural economists in transition countries is now substantially different from what it was in socialist times. During the socialist period, most agricultural economists graduating from universities worked in administration and on farms. Now they are largely employed in private enterprises of which farmers make up only a relatively small share. This change is indicative of the necessity to adjust the system of higher education for agricultural economists.

There was general agreement that demand for agricultural economists is similar in all transition countries, and structure of employment will approach that which is typically found in Western countries. Enrolment in agricultural economics is very high. It was argued that this may also be because the sudden upsurge in demand for studying economics cannot be met by universities. Therefore some students might enrol in agricultural economics. If this holds true, it can be expected that enrolment will decline in the near future. Otherwise, a gradual reduction in the number of students in agricultural economics is likely.

In transition countries, universities offering degrees in agricultural economics are rather diverse, with respect to the kind of degrees offered. Not all have a PhD programme. The 'Doctor of Science' degree is hardly awarded any more. Also the quality of the programme varies considerably. In Russia, many institutes formerly belonging to the Academy of Agricultural Sciences changed their name so as to have the word 'university' included. The bachelor's degree was not offered during socialist times. While some countries recently introduced it (for example, in the National University of the Ukraine in Kiev), it is not accepted at all in others (for example, in Russia).

Curricula are usually not coordinated and certified by a central agency. In almost all countries, universities are completely free to determine the content

of their study programmes. This also leads to a high degree of diversity among them. Some harmonization is suggested, but on the other hand, it does allow for specialization.

Some of the leading universities in transition countries make quite an effort to get the degrees offered acknowledged by universities in Western countries. The rate of success, so far, seems to be rather low. Just a few universities have signed such agreements, including only one or two degrees and not the entire spectrum. However, since the harmonization process is far from being over, a continuation of these efforts is to be expected. This will be advantageous for all concerned.

The problems universities in transition countries face are numerous. Therefore they need assistance in finding solutions and implementing them. One major problem is the lack of sufficient knowledge on the part of teachers and researchers. This knowledge is available in Western countries. To transfer it takes human and financial resources and time. The financial support required can be relatively small if the right strategy is chosen.

One aspect is helping the transition countries to adjust their curricula: synergy effects may be utilized once the basic approach is developed. On the other hand, experts from different Western countries are engaged in such activities. This will lead to some diversity in the curricula, because the differences existing among Western countries will also be transferred. More effort in coordinating this work is desirable.

A rather successful approach in spreading knowledge is courses organized by colleagues from Western countries in which postgraduates are taught basics of agricultural economics. Thereafter, these students will become lecturers themselves. Participants from transition countries have pointed out that providing support for modernizing libraries is also urgent. Teachers, as well as students, lack access to most recent textbooks as well as to Western literature on research. Another bottleneck seems to be the lack of funding for postgraduates to do research in Western countries. Of great concern to all participants from transition countries is the decline in quality of education at all levels, but especially with regard to the PhD degree. There was no general solution to this point.

GROUP 21

AGRICULTURAL TRANSITION IN CENTRAL AND EAST EUROPEAN COUNTRIES AND THE FORMER SOVIET UNION

ORGANIZER LIONEL HUBBARD (UK)

RAPPORTEURS NATALIJA KAZLAUSKIENE (LITHUANIA), WILLIAM H. MEYERS (USA)

The sessions focused on three topics: (1) Price and Support Policies in the CEEC and the FSU, (2) Trade Agreements and Trade Relations, (3) Policy Implications of the CEEC Accession to the EU. Secondo Tarditi opened the first session with a provocative discussion of free market policies in Estonia in the context of distorted world market prices. Estonia, up to the present, has used no tariff protection for food and agricultural products or any other products and has had very little support of any kind for domestic producers. Two circumstances in which free market policies may not be optimal under current conditions are where the exchange rate is overvalued owing to the currency board arrangement in Estonia or where world market prices are distorted downwards by the policies of other countries. Alternative policies to offset these potential distortions include flexible exchange rates, countervailing duties, CAP-like policies and structural adjustment programmes.

Hartell and Swinnen compared agricultural support instruments in Central and East European countries and evaluated the similarity of phases in development of these policies from broad liberalization to introduction of various forms of protection and support. The explanation for these similar paths may lie in a desire to emulate CAP policies of the EU or in political pressures that could explain these developments in an endogenous political economy paradigm. While not conclusive, there is some evidence that political economy analysis can explain some of these similarities.

Bojnec discussed the role of exchange rates and exchange rate appreciation in evaluations of CEEC price levels and levels of protection. Purchasing power parity (PPP) exchange rates were compared to nominal rates in terms of different results obtained for protection levels. Exchange rate appreciation has helped to raise the domestic prices in CEEC relative to values in international markets but has slowed price growth in real domestic currency.

Discussion of these topics focused on the interplay of agricultural policy measures, political forces and market forces as policies in CEEC evolve from forms common to central planned economies to those forms common to market economies.

The second session was opened by Kazlauskiene in a discussion of motivations for regional trade arrangements, their effects on trade liberalization and policy harmonization, and the advantages and disadvantages of these arrangements. The reasons for forming regional trading blocks are often more political than economic, but there can be economic benefits. For emerging markets in transition economies, regional trade agreements can be a good context in which to improve competitiveness within an expanded but still limited market and to develop trade and negotiating institutions and procedures. Difficulties include reconciling differences in trade and domestic policies across member countries and conflicting trade agreements with non-member countries.

Serova presented views on Russia's trade agreements with other CIS countries. Historically, Russia has been extremely reluctant to depend on trade with the 'far abroad'. This attitude has continued to influence trade arrangements with other countries and led to a focus on trade agreements with NIS countries. There is also still an emphasis on government-to-government agreements. Even with other CIS countries, there are huge differences in trade regimes that hamper the development of normal trade relations.

Cela presented the evolving trade and related policy measures for Albania in its efforts to develop a market economy and deal with a very large trade deficit in food and agricultural products. Even the mechanisms for measuring trade flows are in a poor state of development, not to mention the trading and market institutions that are still in their infancy.

The discussion in this session revealed the wide dispersion of experience and development of trade relations, agreements and institutions in CEEC and the CIS. There is a pattern of moving from state control, to quantitative measures, to tariff measures in trade policy and from government-to-government agreements to trade agreements as countries progress in the transition to market economy systems.

Rabinowicz opened the third session with views on the policy implications of CEEC accession to the EU. There is still debate on whether accession means expansion or contraction of CEEC agriculture and what kind of integration is desirable. Current policies and membership conditions were designed by rich countries for rich countries, and their application to poorer new aspirants is difficult. Options are the full application of the current CAP, reform of the CAP prior to accession, a long transition period for CEEC, or a partial renationalization of support programmes. The Commission would oppose renationalization, and the Agenda 2000 proposals indicate the direction reforms are likely to take prior to new accessions.

Meyers discussed market structure problems and the variation in market protection policies in the CEEC. Competitiveness is clearly the most important issue facing acceding countries, since they are far from matching the efficiency of the food and agricultural industry in the EU. Low farm prices do not make an industry competitive if the product quality is inferior and the marketing chain is inefficient. Though they are poor measures of protection in CEEC, the wide dispersion of producer subsidy equivalents (PSEs) across countries in the region show the wide variation in prices and policies that still exist.

Mathijs evaluated farm restructuring and structural policies in view of accession. There is a 'convergence of divergence' when comparing farm structure

in the EU and CEEC. Both have coexisting family and part-time farms and large commercial farms. Support policies are not neutral to farm structure, and CAP policies have favoured large farms rather than small ones. Policy development needs to recognize the farm structure that exists and to anticipate the impacts on this structure. The best rural development policy is actually to stimulate non-agricultural activities and employment in rural areas.

Discussion of these various aspects of accession highlighted the still uncertain processes in early stages of development and the variations in outcomes that could obtain. Both the EU and the CEEC have a great deal of difficult work ahead in preparing for and implementing a process of enlargement that is, at the same time, inevitable and unpredictable.

GROUP 22

FUTURE ROLE OF DEVELOPMENT ASSISTANCE IN AGRICULTURE

ORGANIZER MICHEL GRIFFON (FRANCE)

RAPPORTEUR GERSHON FEDER (USA)

The session was opened by the organizer, who reviewed the background and objectives of the mini-symposium. He observed that donors' aid programmes are changing owing to a number of factors: the collapse of communism, the accomplishment of the 'green revolution' and the overcoming of the debt crisis. Four sets of issues affect future aid: (1) local conflicts, (2) direct commodity channels between some donors and recipient countries, (3) incidence of wide scale poverty and malnutrition, and (4) environmental issues linked to global effects or local sustainability.

While aid is viewed as a solution to some of these issues, it is subject to various criticisms and often lacks a significant local constituency within the donor country. As a consequence, aid has declined in recent years. Aid to agriculture has been declining as well. It has gone from a focus on irrigation, and subsequently on extension/ research, to emphasis on infrastructure. Variations between donors are present, however, and the session attempted to clarify donor strategies.

Alex McCalla described the World Bank approach. He pointed out that past Bank agricultural activities were characterized by high volume but low performance (one-third unsatisfactory). As a result, there was a realization that some of the projects supported were not very effective and a recognition of the importance of policies and incentives. Generally, the volume of lending for agriculture development projects has declined, while social sector lending has increased significantly. The Bank has now developed a vision for its rural assistance activities, stemming from the emphasis on poverty alleviation, and the recognition that the key to poverty alleviation is rural development, broadly defined. The action plan adopted by the Bank emphasizes the importance of the policy environment, and avoids past failures such as overly complex projects. Emphasis is shifting from projects to programmes, and partnership and donor coordination are sought. The Bank has now initiated the implementation of the action plan, and some increase in the volume of agricultural lending is already evident.

Shirley Prior outlined US assistance to agricultural development. She noted that there has been a marked decline, related to a perception that agriculture was not important. There has also been a general decline in public support for

foreign aid. As a result, technical competence in aid administration has declined. While a major increase in aid to agriculture is not envisaged, there has recently been some renewed interest. An advisory board and leading agricultural economists are trying to affect USAID's strategy so as to put greater emphasis on agriculture, observing that such a strategy is in the US interest.

Gunter Dresrusse's presentation on the German aid programme pointed out that, because of major transfers to the former East Germany, the volume of assistance to developing countries has declined. About a third of ODA is channelled through the UNDP and a significant amount through the European Community and the World Bank's IDA programme. The overall objective of German ODA is global sustainable development, with priority to poverty alleviation, the environment and education. A focus on Africa and Eastern Europe characterizes the programme. The share of support for agricultural development has declined from 40 per cent to 30 per cent. There is a sense that the assistance to agriculture failed to link the activities to growth, employment, environment and equity. Current strategy emphasizes programmes more than projects, less state control, flexibility in decision making, 'up-front' strategy discussion and staff performance.

In a discussion among participants, several generic points emerged. Is aid through technical assistance still useful? Is it contributing effectively to the build-up of local knowhow? Speakers stressed the importance of greater involvement of NGOs and of cultivating the private sector in the donor country as a constituency supporting aid.

Shiro Okabe's presentation on Japanese aid stated that the most distinctive feature of the Japanese ODA is its enormous volume (US$14.5 billion in 1995). Approximately 48 per cent is supplied in the form of Yen-credits (mostly infrastructure) and the rest through a grant aid. During the period of the 1950s–70s, the principle of request-based aid provided the Japanese private sector with opportunities for export business. This partly contributed to forming a local constituency for aid. Another principle of Japan's ODA was a policy of non-intervention in recipients' domestic affairs. The major objective of agricultural ODA since that time has been to transfer production technologies and to improve relevant infrastructure, particularly irrigation facilities. Under the changing global conditions, since the 1980s, the principles of Japanese ODA have had to be modified. Accordingly, the government established an ODA charter in 1992. Special attention is now paid to social equity of the ODA benefits in rural areas, greater support for the poorer sections and undernourished people, and maintenance of the limited natural resources and environmental conservation. Towards such quality improvement of the Japanese ODA in agriculture, special strategic arrangements for the initial step are required. Most importantly, the will of the Japanese government has to be firmed up in promoting improved agricultural ODA programmes to integrate economic, social and technological developments in rural areas.

The French ODA programme was discussed by Bruno Vindel. Aside from the support to multilateral aid agencies, aid and development credit are also provided directly by the Ministry of Cooperation, the Ministry of Foreign Affairs and the Caisse Française de Développement. While agriculture is not a specific area of emphasis, it is addressed through priority given to poverty

alleviation, natural resources management and overall growth. There is significant focus on sub-Saharan Africa. About one-third of bilateral aid is going to agriculture and rural development. Assistance to agriculture highlights programmes enhancing food security, the formation of regional markets for agricultural commodities and the improved competitiveness of commodity chains. Programmes attempt to make a rational delineation of the roles of the state vis-à-vis other players, highlight policies for more efficient agriculture and establish a regulatory climate that maintains the sustainability of investments. Experience has shown that success in assistance programmes requires farmers' participation.

William Anderson outlined the Canadian development assistance programme in the area of agriculture. He noted a significant decline in support to agriculture between the 1980s and the 1990s. Areas of priority are environmental protection, basic needs, private-sector development, human rights and women in development (WID). He pointed out that past agricultural support programmes have failed to pay attention to WID aspects, but CIDA has had positive experiences with community-based development projects. Sub-Saharan Africa is emerging as an area of focus, where agriculture will be a priority area. A shift to country-specific programmes (away from multi-country projects) is envisaged.

In the discussion which ensued, views were expressed that beneficiary participation is not by itself a guarantee of success (although it is a necessary ingredient). It was also pointed out that political interference can often stifle the sense of empowerment and self-governance that is initiated by some projects. To promote greater donor support for agricultural development, it is important to demonstrate that agriculture has important linkages to other sectors and can contribute significantly to overall growth, in particular in an open economy. In fact, in the early stages of development, agriculture can be the lead sector. Furthermore, it is a key to poverty alleviation. It was suggested that institution building and capacity enhancement should be the focal areas for development assistance. Assistance to agriculture should avoid a narrow sectoral approach and should recognize intersectoral linkages, with due attention to the overall macroeconomic and policy environment.

GROUP 23

AGRICULTURAL PRODUCTIVITY: MULTILATERAL COMPARISONS

ORGANIZERS SHANKAR NARAYANAN (CANADA), COLIN THIRTLE (UK)

RAPPORTEUR JEFF CORMAN (CANADA)

Led by Colin Thirtle, Reading University, UK, the group spent the first 20 minutes introducing themselves, relating their experience and their expectations for the discussion group and adopting a tentative agenda covering the following areas: (1) background and motivation for total factor productivity (TFP) analysis, (2) issues and problems surrounding international comparison of TFP, (3) miscellaneous issues such as integration of environment impacts within a TFP framework, TFP analysis and country's competitiveness, TFP of food processing sectors and inclusion of varying quality differences for both outputs and inputs.

Background and motivation

Colin Thirtle began by asserting that the techniques employed in developing TFP indices were not all that onerous; the true value and pay-off is in explaining why certain TFP behaviour happens. Initial impetus for this work in Britain occurred as a result of Margaret Thatcher's demand for justification of the use of public money in agricultural research rather than having it done by the private sector. The biological scientists were at a loss to provide this justification, which created the demand for agricultural economists and their analysis of TFP growth.

Measurement of productivity uses basic accounting techniques and national income accounts data. The inevitable goal is to estimate consistent and unbiased aggregate measures for outputs (Q) and inputs (X). On the output side, TFP index calculation demands production-based data. In Britain, use of national accounts data (farm income data) presents problems in terms of proper account for inventory changes. This adjustment needs to be made to determine actual production within the year. In the United States, the situation is better since farm production data are available. In general, it was agreed that the analysis has to have a good idea of what is contained in national farm-level data, paying particular attention to timing problems and data sources (that is, appropriateness of FAO data for TFP development).

The issue of accounting for environmental benefits and costs of product/commodity qualities provoked an interesting discussion at this point. It was noted by Johannes Roseboom that, unless the environmental impacts have a price consequence, they will have no impact on farmers' behaviour. However, Heinrich Hockmann pointed out that, although immediate impacts may not be evident, change in environmental factors (such as land) could result in longer-term changes in productivity. This led to a general discussion of failings of production function theory. In particular, Jim Hildreth noted that the management factor has never been adequately incorporated within the theory. This observation led to speculation concerning how management might be captured within a production function arrangement, with suggestions that beers drunk and time spent in bars may be a better proxy for the level of farmers' production knowledge than years of schooling or number of PhDs involved in agriculture.

The discussion returned to the issues surrounding the aggregation of inputs. Colin Thirtle grouped inputs into three general classes: fundamental inputs, land and labour; intermediate inputs, chemicals, feed and seed; and capital items, financial capital and machinery. The discussion about the inputs produced a familiar roster of issues: adjustment for quality differences, the basis of measurement and the maintenance of a consistent accounting framework.

There are certain technical advantages in including both a land and a labour component in agriculture for calculating a TFP index. Quality adjustments are typically made for the labour component, and recent work within USDA is trying to extend this to land. The intermediate goods must be treated in the same way. Jim Hildreth pointed out that interaction between intermediate inputs are important, and this led to a discussion regarding appropriate functional form. The use of the Cobb–Douglas function came under critical discussion.

The accounting for capital items caused the greatest technical problem. Ideally, the goal is to measure the true flow of service emanating from a capital item. Real interest rates are fine for calculating an economic depreciation; however, things quickly fall apart when real interest rates are negative. Johannes Roseboom indicated that similar problems are encountered in accounting for capital subsidies.

A second major approach to estimate aggregate output and input is by the use of econometrics. Using duality, profit functions can map to production functions, and positive estimates can be obtained. Programming offers yet another alternative, with the results being used to develop Malmquist indices. The advantage of the programming technique is that no prices are needed, the amount of aggregation is limited and no behavioural assumption need be imposed. Best-practice isoquants are developed and programming leads to estimates of how far farmers are from these. There are, nevertheless, real problems with this type of aggregation.

Session 2

Robert Townsend reported on the technical aspects and advantages/disadvantages of different indices: Malmquist and Tornquist. Jean-Christophe Bureau

also reported on techniques and problems in doing international comparison of TFP.

Session 3

Terry Veeman began by asking about approaches to handling private as opposed to social productivity growth. Specifically, how does one adequately account for social amenity values and environmental damages in calculating productivity indices? The major drawback identified was the paucity of longitudinal data on environmental impacts. Although this was accepted as a problem, suggestions were made to measure the decline in recreation activity around plants (pulp and paper in this instance) as a proxy for environmental damage.

Colin Thirtle then related the work of David Hudley, a PhD student at Reading University. Hudley used farm cost surveys from 1200 farms over an eight-year period, together with a GIS system which could match water quality (nitrate levels) to individual farms. Using techniques of distance functions, duality (the Horowitz Theorem) and inclusion of a negative (constrained) output, Hudley was able to determine an individual farm's willingness to pay to carry on its polluting activity. The question was whether this overestimates or underestimates the 'true' social cost of the farms' polluting activity.

David Schimmelpfennig concluded the session by relating some work on research and development spillover and the relationship to national agriculture productivity growth. The motivation for looking at this arose from trying to understand why countries like the United States and France recorded production growth rates of 3 per cent annually for the period 1973–93, whereas the United Kingdom produced an average annual growth rate of 1.6 per cent. In fact, the rate of productivity growth rates of one group of nations (including the United States and France) converge at this higher level, and those of a second group (including Britain and Germany) converge at lower levels.

Initial attempts to explain the differences in TFP growth rates used a more traditional function which included the levels of public and private R&D, extension system, level of education of farmers and weather. Results of regressions were poor and indicated an incorrectly specified functional form. Another function was employed which attempted to get at the stock of knowledge, the quality of labour and weather as major explanatory factors. In this specification, the idea of learning by doing (endogenous growth) and learning by sharing knowledge (external growth) appeared to have better explanatory power. Convergence of various factors in the two growth country groups lead to the conclusion that knowledge spillovers from one country to another helped explain the patterns of TFP growth.

There still seems to be the question why some countries hang together and achieve higher TFP growth rates and other countries achieve lower TFP growth rates. All manner of explanations are postulated, greater sharing among national public research institutes and a common approach to intellectual property rights being a couple. However, in the end, it would appear that similar re-

search culture and R&D spending offer the best explanation. An interesting implication of this work for international competitiveness is that, with research spillovers benefiting not only the country doing the research but its partners as well, arguments for isolating a nation's R&D cannot be supported.

GROUP 25

POLITICAL ECONOMY ANALYSIS IN AGRICULTURAL ECONOMICS: CONCEPTS AND EXPERIENCES AMONG COUNTRIES

ORGANIZER ROBERT G. SPITZE (USA)

RAPPORTEUR MICHELE VEEMAN (CANADA)

The presentations and discussion in this group focused on the processes by which agricultural policy is made. Contrasting examples of the differences in the procedures and outcomes of agricultural policy making in different nations were provided by the participants. These illustrated the wide range of differences between nations in the political and economic structures within which agricultural policy is developed. The associated discussion illuminated the impact of different political, legal and social structures and institutions in agricultural policy-making processes.

The discussion encompassed outlines of the policy-making process in the European Union (J. Bryden, G. Allaire, J. Anton and A. Fantini), Canada (M. Veeman and R. Bollman) and the United States (R. Spitze and J. Wells). The procedures by which agricultural policy is formulated were also outlined for Laos (P. Warr) and Nigeria (A. Ikpi). Features of the current approach and outcomes of agricultural policy in Indonesia were outlined (P. Warr), as were features of the policy environment and outcome for agriculture for Brazil (E. Teixeira).

One facet of discussion was the broad issue of the inconsistency in the approach to agricultural policy between many developing and developed countries. This discussion noted the low, frequently negative, levels of protection for agriculture in many developing nations in which agriculture often constitutes the major component of economic activity. In contrast, in most high-income countries, in which agriculture constitutes a relatively low proportion of national output and employment, this sector is typically protected and supported. One point of this discussion was the lack of power and influence of individual farmers in many developing countries. However, there are relatively low costs of organization and considerable motives for rent seeking associated with protection in high-income societies. The incentives to organize and seek sectoral protection were concluded to be particularly evident in agriculture, because of the immobility and importance of the fixed factor of the land input in this sector.

The discussions of the group included instances of both effective and ineffective agricultural policies. For example, contrasting outcomes of top-down planning

approaches to agricultural policy pursued by two oil-rich developing nations, Nigeria and Indonesia, were cited. The Indonesian policy to encourage increased domestic supply of rice, focused on provision of inputs through development of reliable irrigation, as well as on high-quality education in rural areas, was noted to have been very effective in contributing to rural employment and in achieving substantial increases in food supplies. In contrast, instances of lack of consistency and effectiveness of some nations' policies to encourage food self-sufficiency were also cited. One example is the restriction on food trading across national boundaries, as in areas of Africa. Similarly, attempts to limit 'slash and burn' agriculture by limiting the land that villagers can use in Laos has been counterproductive and has led to rapid land degradation.

Another theme of discussion was related to the relative importance of different farmers' associations in North America and Western Europe in influencing the formation of policy for agriculture. Participants saw a tendency for increasing political and economic influence of commodity-specific farmers' organizations and some decline in the influence of general farm organizations which had been of more importance in earlier years. The importance of the institutional structure, within which agricultural policy is developed, was highlighted in a discussion of the differing political viewpoints relating to the agricultural sector in some of the nations of the European Union. The necessity for compromise between different national interests that is embedded in the institutional structure of the European Union was elucidated. Similarly, the institutional structure of agriculture policy making in the United States and Canada was outlined in some detail.

Overall, from the discussions, it was evident that both political and economic objectives and constraints are powerful influences in the development and application of agricultural policy. In general, however, there is a tendency for an increasing influence of external constraints and stimuli on agricultural policy, arising from the internationalization of the global economy. The growing importance of regional and multilateral trade agreements on the formation of national agricultural policy is continuing expression of this tendency. Nonetheless, there are wide differences in the political economy of national policy making for agriculture and the approaches to farm policy taken in different nations. Participants agreed that economic analysis of agricultural policy requires an understanding of the social and political structures within which agricultural policy is developed; the discussions were helpful in contributing to this.

GROUP 26

QUALITY AND ENVIRONMENTAL MANAGEMENT FOR COMPETITIVE ADVANTAGE IN AGRICULTURE AND THE FOOD INDUSTRY

ORGANIZER GERHARD SCHIEFER (GERMANY)

RAPPORTEUR GERHARD SCHIEFER (GERMANY)

Introduction to the subject

Agriculture and the food industry face increasing requirements on the quality of its products and the environmental consciousness of its production and trade activities. These requirements are only partly due to administrative regulations, being primarily a result of changes in consumer preferences and the society's evaluation of agriculture and the industry's impact on the environment. These requirements pose a major challenge to management in today's competitive food markets, leave little room for problem solutions and increase costs.

Improvements in the organization, control and management of processes in enterprises and throughout the vertical chain of production and trade (agrifood supply chain) are the major focus of research and management to cope with the challenge. Such improvements include the following:

- the establishment of management systems (management routines) which might follow the schemes outlined in the international standards for the organization and documentation of quality management systems (ISO 9000) and environmental management systems (ISO 14001 or the European Environmental Management and Audit Scheme (EMAS));
- the identification and reduction of the costs associated with quality production and environmental protection;
- the identification and elimination of potential hazards and failures in food production;
- the identification, evaluation and reduction of negative effects on the environment.

The mini-symposium involved five presentations which introduced participants to the subject and served as a basis for further discussion.

Overview presentations

The presentations started with a tutorial by G. Schiefer (University of Bonn) on quality and environmental management, followed by an overview on the relevance of 'metasystems' and 'metastandards' for the food industry by M. Bredahl (University of Missouri). The definition of metasystems and metastandards incorporated the standard series ISO 9000/14001 for management systems and involved the consideration of system and transaction costs. This introductory discussion emphasized the relevance of the subject for (1) individual enterprises (farms and industry), (2) the structural development in the agrifood sector, (3) market structures, and (4) agricultural policy. It was argued that one possible line of development would lead to a restructuring of the sector towards competing agrifood production chains in which farms, processing and trade cooperate closely. The chains, and not the farms, might become the principal economic units to be addressed in the not-so-distant future.

It was obvious that the broad aspect of the possible consequences of the developments could not be covered by the mini-symposium and warranted a much broader consideration.

Focused presentations

The second group of presentations did focus on approaches to identifying and reducing quality costs. A. Starbird (University of Santa Clara) elaborated on the potential cost advantages of adversarial or cooperative relationships between members of a supply chain. C.A. da Silva (University of Vicosa) presented a framework for a decision support system which aimed at cost reductions through process improvements.

Apart from gains in product quality, possible gains in efficiency through savings in costs are a driving element in today's quality management efforts. They build on improvements in process efficiency and on appropriate chain management activities. The papers did focus on management support aspects to reach the goal. Some of the discussion focused on empirical evidence which supported the claim of cost effectiveness of quality management. A study by M. Bredahl and his research group among British food companies supported the claim. A study by G. Schiefer and his group among agrifood companies, which had introduced quality management systems, showed that, in an initial phase, companies might face increases in costs (training and so on) but that the introduction of quality management systems supported initiatives for process improvements which would eventually lead to a reduction in costs.

R. Huirne (Wageningen Agricultural University) introduced a model for chain optimization which was implemented in industry and elaborated on problems surrounding the distribution of financial gains among participants in the supply chain. The presentation demonstrated the potential of process improvement initiatives, but also showed the need for farms to strengthen their position within chains. This includes access to the results of improvement initiatives as well as the ability to reserve an 'appropriate' share of the outcomes for the farms.

A last paper, presented by R. Helbig (University of Bonn), introduced the limits of today's environmental management initiatives and the need for further research in the subject area.

Concluding discussion

The group considered further advances in the implementation of quality and environmental management systems in the agrifood sector, the most probable development at least for Europe and the United States, and emphasized potential trade barrier effects that might arise.

It was also made clear that the implementation of a certified management system was of little value for customers as long as it was not combined with a clear description of the implemented level of quality or environmental protection which, in principle, could be introduced through an appropriate labelling policy.

Members of the group expressed their astonishment that the majority of agricultural economists did not seem to realize the potential impact of the developments on the sector and, in consequence, for the profession. A close cooperation among those working in the field was considered a means to promote knowledge about the developments and the possible consequences of quality and environmental management initiatives in agriculture and related industries.