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Synoptic View

It is a very great privilege to present the closing synoptic view of the Twenty-Third Conference of the International Association of Agricultural Economists. Let me immediately recognize the tremendous effort made by many people in organizing a very successful meeting, beginning with Joachim von Braun, for undertaking the huge task of arranging the programme. The conference continues to change its shape, with new ideas and design. It has been shortened to six days, but it has more papers than any previous meeting. We all owe Joachim a debt of gratitude for his innovations and efforts to improve the quality of the papers while, at the same time, maintaining the intimacy and opportunity for discussion in these gatherings which has been a valuable tradition of the IAAE.

I also want to applaud the work of Peter Hazell for his role in organizing the contributed papers. His task has increased substantially from previous conferences, going from about 45 contributed papers in Harare three years ago, to 111 at this conference. Similarly, Arie Oskam has organized the poster sessions, as well as introducing computer-based presentations. The IAAE was one of the first associations to have poster papers and has now been followed by many others in using this presentational method. Arie has set a standard for others to follow. Finally, in terms of programme development, I must acknowledge Larry Silvers for his continuing work in once again organizing the workshops and symposia. These elements in our programme set our conferences apart from others, they strengthen the dialogue among our membership, foster network building around the world and, above all, forge professional friendships which last through our lifetimes.

In preparation for our meetings, the work of the host country organizing committee is of critical importance. Led by Jerry Siebert, the group has made us all feel welcome, provided excellent facilities and offered a wonderful glimpse of the agriculture and processing industry located in central California. I need also to praise the work of Nicole Ballenger, Chair of the US Organizing Committee, in turning the concept of a meeting in California into reality for all of us.

I also want to recognize the untiring dedication of Bernard F. Stanton (Bud, to all of us) in leading the Fund for the International Association of

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Agricultural Economists. For a number of years, Bud has taken the lead in raising funds to ensure support for attending this conference for many from the developing world. With help from others, particularly our Vice-President Programme, Joachim von Braun, Bud has raised a record amount of funding, involving a wider array of donors and with more individuals supported for attendance than ever before.

Our conference attendance is about 760 members, one of the largest ever held. This is a tribute to a strong association representing all parts of the world, the attraction of California as a location and the quality of the presentations over the past week. To the many people involved in making the event a success, I want to express my appreciation and to extend on your behalf our heartfelt thanks for a job extremely well done.

Finally, I welcome the members of the new Executive Committee of the IAAE. I look forward to working with each of you over the next three years, both to maintain the momentum established under our more recent Past Presidents, Bob Thompson, Csaba Csaki, John Longworth, Michel Petit and Glenn Johnson, for continuing change to meet the needs of our members around the world, as well as to prepare for our next triennial conference in Berlin, Germany, in August 2000.

I have taken the time and space in this address to recognize these individuals and teams because of the tremendous work they have done. Of more importance, however, is that our conferences offer the vehicle for the renewal of personal and professional friendships among all of us and provide the venue for exchange of ideas and the dissemination of the foremost thinking in our profession from all corners of the earth. This basis of friendship and understanding was the central purpose expressed by Leonard K. Elmhirst and his colleagues in 1929: 'to bring together agricultural economists and research methods that were of common interest, to discuss national and international problems in the field of agricultural economics and to promote a more effective and more rapid exchange of agricultural economics information'. Our organizers have met that goal with creativity, hard work and dedication to our organization.

THE CHALLENGES

The Synoptic View is a unique feature of the IAAE. In preparing for it, I became curious about the word 'synoptic'. The *Concise Oxford* offers the following definition: 'adjective, of or forming a synopsis; taking or affording a comprehensive mental view; of the Synoptic Gospels (Matthew, Mark and Luke); giving a general view of weather conditions'.

Since I do not intend to add to the Scriptures, or to comment on the near perfect weather here in the Sacramento Valley, my talk today will attempt to combine synopsis with overview. In previous Synoptic Views, the full range can be found. Some make little if any reference to the conference content; others carefully mention most papers, pulling together the many strands of ideas presented and debated. Some have offered their own framework or context within which some of the papers are noted. One (Glenn Johnson) has even

suggested that the Synoptic View is included to assure everyone that the President-Elect has done his homework.

Since there is no standard format, I begin with some comments on both the Association and our conference. As I have indicated, the workshops and mini-symposia were originally intended to offer open debate without lengthy presentations. Indeed, in the course of these sessions over many conferences, I have made and maintained many friendships that I would not have been able to establish otherwise. At this conference, a number of the workshops became paper presentation sessions, without so much debate, discussion and friendship building, and without the benefit of peer review required for access to other parts of the programme. I look forward to your views through the survey enclosed in your conference materials about the workshops. My personal view is that I would like to see the debate and friendship-building opportunities increased and the paper presentations decreased.

Second, the panel sessions instituted by Joachim von Braun in this conference are a new and different way to survey and synthesize the knowledge in various fields of interest to our profession. I am excited by them because they offer a creative avenue for our members to bring together materials and ideas in different ways. While there is the risk that the panels also become unreviewed paper sessions, the opportunity also exists for maintaining the high quality begun at this conference and, with some entrepreneurship on the part of organizers, potentially stand-alone monographs or edited volumes could result. I hope we can build further on what Joachim has begun at this conference. Again, I look forward to hearing your views through the survey.

Third, during the past three years, the Executive has spent considerable time examining future directions and strategies for the IAAE. We have identified many challenges and opportunities for streamlining our costs, better serving our membership in creative ways, ensuring access to the Journal, the membership and the Executive from all parts of the globe. I most sincerely appreciate the support which will be provided by the IAAE Council to the Executive in addressing these issues over the course of the next three years. Your views on specific issues and ideas are most welcome. Getting in touch with me or any member of the Executive will ensure that your views are heard and considered.

The theme of this year's conference, 'Food Security, Diversification and Resource Management: Refocusing the Role of Agriculture?', offers an excellent opportunity to assess progress and discuss the continuing challenges to the profession articulated by Bob Thompson in his Synoptic View three years ago (Thompson, 1995). In responding to these challenges, I want to divide my remarks into five sections: Food security, development and transition; Environment; Technology; the Management of resources and farms; and Diversification. My concluding remarks will address the question embedded in the theme on refocusing the role of agriculture.

Food security, development and transition

At the 1982 IAAE Conference in Jakarta, Indonesia, the topic of growth and equity in agricultural development was the centre of the debate (Maunder and

Ohkawa, 1983). The rapid growth in food supplies through the 1970s, based on the 'green revolution', as well as high cereal prices particularly in the first few years of the decade, gave rise to increased concerns about equity around the world in access to food. The general conclusion from that conference was that growth and equity could coexist, and that maintenance or improvement in one of those elements did not necessarily attenuate the other. Supporting that conclusion was the growing conviction that hunger and poverty were closely related if not identical phenomena, and that resource and technology access were the most important means for improving the condition of the poor and the hungry.

The 1982 conference came after a two-to-three decade effort in increasing food supplies, particularly in the developing world. There was great optimism and opportunity coming from that meeting 15 years ago. Since then, we have seen the most significant change in the world trading regime in several decades with the completion of the GATT Uruguay Round, the rise of the regional trade agreements, considerable expansion of the European Union, an opening of the markets in Eastern Europe and the former Soviet Union, and considerable domestic and trade policy change in China, India, Latin America and, more recently, in Africa. At the same time, we have witnessed a substantial shift in the priorities of the development agencies towards structural adjustment, declining expenditures in research on agriculture, and substantially shorter time horizon expectations for results from developmental investment than those which characterized the period before 1982. By the mid-1990s, we had also experienced a seemingly tighter world food supply than even during the crisis days of the early 1970s.

This span of 15 years has also led to a very considerable expansion in the range of issues we face. Among them are questions about price stability in more open international markets, the use of biotechnology to meet problems in developing and developed countries, how change in China will affect internal food production and world markets, future levels of farm resource availability and the impact of emerging and transition economies on the rest of the world. The dichotomy between those who have argued that immense quantities of additional food will be required in the next two decades and those who expect there to be food adequacy if greater attention is given to access to food for the poor, wherever they may be, has also been very obvious. For nearly a decade our profession and other specialists have been trying to find an agreed position on these issues and to decide on the priorities for agricultural and food development across areas of the world with great diversity in climate, income levels, technology and resource capacity, and environment. The World Food Summit, held in 1996 in Rome, was designed to explore these emerging priorities and the conflicting views on them.

Many papers at this conference offer quiet optimism that a substantial and stable agenda for action is re-emerging after some years of discussion in terms of food security, diversification and resource management, as well as in the role of agriculture in these matters. At the global level, the Pinstrip-Andersen and Pandya-Lorch (P) paper, arising from the IFPRI study exploring food supply, demand and the related resource issues up to year 2020, provided an outstanding foundation for much of the work of the conference. There are

several related papers that extend and strengthen many of the conclusions of the IFPRI study. These provide an array of evidence on the emerging or transition economies of Central and Eastern Europe, noting the difficulties in the economic transformation to a market economy, particularly the slow progress in the institutional, legal and contractual arrangements needed as a foundation for a market economy.

Institutional economics forms a major part of many papers at this conference. This includes the institutional organization in developing and transitional economies, as well as in trade development. The best way to sum up is to say that we are relearning that Adam Smith's invisible hand must be attached to a highly visible and well respected 'long arm of the law', and the civil institutions that go with it throughout the body politic.

The paper by Ke Bingsheng (P) gives a rare overview of the breadth of change and continuing challenge in mainland China. Distribution remains a critical determinant of food security for China, being allied with the closely related infrastructural and institutional needs. He clearly notes that, without greater attention to the latter two issues, China cannot expect to resolve her internal distributional problems. Additionally, the consequences of failing to solve them could have a very heavy impact on markets around the world. The conclusion drawn is that China's grain balances are likely to require increased imports, though not on the massive scale suggested in other literature. In their discussion of India, Rao and Radhakrishna (P) make a similar set of points, but also express some concern about the results of structural adjustment which are now beginning to be displayed. Many other papers, as well as the regional panels, offer insights and updates on issues and directions for sub-Saharan Africa and Latin America.

Food security at the household and intra-household level has also been explored. Senauer and Roe (P) offer considerable insight into the variation in food availability among members of the household, even though food adequacy at the household level exists. Similarly, the Umeh, Amali and Umeh (F) paper calls attention to the interaction between endemic disease problems and labour productivity. These two papers suggest considerably more work needs to be done to better define and direct food and nutrition programmes.

Collectively, these and other conference papers offer the view that food demand is unlikely to outstrip world capacity to produce it. Nonetheless, food insecurity is likely to remain entrenched in South Asia and in parts of Latin America, and become worse in sub-Saharan Africa. Sustained and sustainable growth in food supply continues to represent the greatest challenge in research, extension, human capital development, infrastructure and economic policy. To make improvements, there are a number of conditions which will have to be met. First, the continued and possibly larger commitment to agricultural research on a sustained basis is vitally necessary. The appropriate public-private roles in research and technology transfer need more attention by our profession. Second, the institutional arrangements within each country represent a critical component of development, particularly the legal bases of land ownership, contracting, marketing arrangements and pricing. Third, the infrastructure base for distribution within much of the developing world is a growing cause for concern in meeting the needs of the poor and hungry, contributing to the

stability of domestic and international markets, as well as the creation of markets for exchange. Fourth, household-level food security and health status among household members are obviously important in themselves, but also affect labour capacity and productivity at work. Finally, a number of new and different constraints need increased attention. Water policy and access to new materials deriving from biotechnology are examples of significance in the developing world.

Environment

Keith Campbell's 1982 Elmhirst Lecture presented a strong case for increased involvement of agricultural economists in the growing issues regarding the environment:

governments in the next 25 years are going to be increasingly pressed to make trade-offs between the use of modern technologies to boost food production and the avoidance of damage to the environment. But they cannot afford to accede in an irresponsible way to the wishes of urban based environmentalists or the scientifically illiterate. (Campbell, 1983, p. 16)

In reflecting on previous conferences, we have been somewhat slow in trying to dispel the illiteracy noted by Campbell. I was pleased, then, to see the range and extent of papers at this conference addressing environmental issues.

The paper by Hall (P) provides the broadest mass of evidence for the existence of global warming, including some of the generalized effects we can measure and verify, as well as many of the relationships that elude precision and quantification. What it suggests is that we have not pushed back the illiteracy very far on issues of global scale changes in climate. But the work is under way.

Several papers explore environmental issues on less than a global scale, at farm and regional level, thus representing the emerging literature on specific environmental effects of farming systems in particular parts of the world. An example is the paper by Zeddies and Lothe (F) examining the greenhouse gas balances in crop and dairy farms. As an aside, I note that one of the IAAE inter-conference symposia was held in The Netherlands in 1996, focusing on chemicals in agriculture. A publication from that symposium, edited by Wossink, van Kooten and Peters (1998), will be available shortly.

It is particularly interesting to observe the growing recognition of the fact that annual and perennial crop agriculture shares the land resources of the world with forestry, and the water resources with fisheries and other non-agricultural demands. Bringing these aspects to bear on longer-term food supplies is increasingly important to our understanding of the balance between expanding food supply and sustainable food security.

Finally, on the topic of environment, I want to note the growing body of work on the trade-offs between pesticide use, research to develop varietal resistance and its maintenance, integrated pest management and the new pesticide-tolerant varieties now coming on the market. Papers at the conference

(Widawsky, Rozelle, Jin and Huan (S), for example) suggest that there is substantial overuse of pesticides in some regions, coupled with obvious incentives for increased integrated pest management, research in varietal resistance and more sustainable production practices.

In general, we appear to be addressing the scientific illiteracy issue identified by Campbell. The task is taking us into new and different areas, stretching our economic theory and substantially extending it, creating the development of cross-disciplinary, problem-solving approaches, and forcing us to rethink earlier conclusions which were drawn without the inclusion of environmental variables. There is no evidence from the papers that dealing with environmental problems need prevent growth or that it is inimical to the improvement of the human condition, a fundamental concern of Campbell. It is clear, however, that it does add to the complexity, the human capital requirements and the breadth of disciplines required for all of our research and policy endeavours.

Technology

I am including technology as a heading because of its very great importance in the agriculture and food industries over the past several decades. The original work of Hayami and Ruttan (1971), which is familiar to all of us, offers both theory and descriptive underpinnings for technological change for nearly three decades. More recently, the review by Anderson and Herdt (1989) in the 1988 IAAE Conference in Buenos Aires about the state of our technology generation for agriculture provided an excellent summary of the range of work to date, primarily under the CGIAR but also by the NARS. The conclusion is worth recalling: 'There may be many important (often life-threatening) distributional problems to be overcome, but our growth scenarios suggest relative ease for the human world to feed itself quite adequately into the next century' (Anderson and Herdt, 1989, p. 691). Since this was written before the huge growth in research on transgenics, one would infer that their statement would continue to hold today. Indeed, it is a similar conclusion, based on a somewhat different body of evidence, to that of Pinstrup-Andersen and Pandya-Lorch (P).

Some papers at this conference add to the evidence summarized by Anderson and Herdt, going beyond the adaptability and development of new varieties and their associated inputs. Pender (S) explores the application of neoclassical growth theory to population growth and agricultural intensification, suggesting that induced innovation occurs in both resources and man-made capital. This paper expands the scope of earlier work by bringing sustainability into the equation, as well as looking at the results in terms of income and productivity improvements. The work by Thirtle, Bottomley, Palladino and Schimmelpfennig (S) provides an interesting disaggregation of the returns to specific varietal development in wheat in the United Kingdom, implying that a higher rate of return had been obtained than was usual in the more general studies across all research. It suggests that more work needs to be done on rates of return to specific transgenic varietal development and on the public-private balance of investment and returns on new materials. The Masters, Bedingar and Oehmke (S) paper reviews a large number

of studies in Africa, concluding that three-quarters of them report returns to research of over 20 per cent, although the results have largely been seen only in the past decade because of the delay in implementing policies to stimulate the use of new technologies. The paper appears to confirm the more general conclusion that macroeconomic and industrial policies need to be designed to encourage technology adoption, once technology exists. This represents an extension of the conclusion by Yair Mundlak (P) that agricultural development is a necessary condition for overall economic growth. Other papers continue to explore the technologies for the more different agricultural dryland environments, such as the Sahel. Progress appears substantially slower than for the more favourable production conditions.

In 1991, at the IAAE Conference in Tokyo, one of the plenary sessions included a talk by a biological scientist, describing in layperson terms the methodology behind gene splicing and transgenics (Peacock, 1992). This fascinating presentation laid the groundwork for what many of us are now increasingly familiar with, both in products we consume and in the research and policy issues we face. The papers at this conference certainly cover a wider span of issues in technology than ever before, ranging from the investment in, and dissemination of, technology at farm and national level, to the regulatory issues arising from the new technologies.

I draw attention to the emerging regulatory issues surrounding these new technologies. In the recent Uruguay Round, member states agreed to a science-based and risk-based approach to regulation of technologies and processes. With the general public having a growing distrust of science, I foresee increasing difficulty in finding public policy which is simultaneously acceptable to citizens, acceptable to World Trade Organization panels, and encouraging to the development and application of the new biotechnologies. Similarly, the rejection of policy and regulation based on science, in either general or specific cases, generates the opportunity for countries to retreat from the trade liberalization in the face of public opinion. I think the profession has a great deal of work to do in overcoming this distrust of science, to allow safe, practical and productivity-enhancing technologies for the benefit of food security and the human condition. The paper by Bureau, Marette and Schiavina (F) is one of the first attempts to explore the economic welfare impacts of consumer acceptance or distrust of new technologies, specifically, the beef hormone question in Europe.

The management of resources and farms

There are a large number of papers at this conference which fall into this category – not surprisingly, since the issues of efficient use of scarce resources form the basis of the work in our profession. I would add that many poster papers also address issues of resource use and farm management. Many of these papers draw linkages to other topics, including food security, trade, technology, environment and diversification.

A number of papers, including Moore and Nieuwoudt (F), De Klerck, Townsend, Kirsten and Vink (F) and Mbowa and Nieuwoudt (F), explore the

emerging land distribution problems in Southern Africa and their impact on economic efficiency. This topic was initially explored in Harare at our conference three years ago. Others, like Pender and Kerr (S) and Chakravorty and Umetsu (F), examine the allocation of water among competing use, a growing concern in many developing countries, as well as in Europe (Varela-Ortega *et al.*, (S)). Li, Rozelle and Brandt (S) contribute to the evidence that payments for property rights are a necessary component of policy, both to preserve commonly held resources and for efficiency in resource use. Doss (P), Schreiner, Graham and Miranda (P), and Bresnayan (F) add to our knowledge of household behaviour. Other papers add to our methodological tools in examining and solving allocation and efficiency problems at farm and household level (Peter Witzke, (F)).

This work substantially enriches our understanding of specific allocation and efficiency issues around the world. While generalizations about land tenure, farm size, water allocation, property rights, research and extension utilization can often be made, based on many years of research, the detailed measurement and knowledge of these specific situations are of immense value to local and national policy makers, as well as international institutions.

Diversification

The Delgado and Siamwalla (P) and the McCalla and Valdés (P) papers draw similar conclusions about whether diversification is a product of policy, or an objective of policy, in developing countries. Essentially, they argue that getting policy distortions removed from both the domestic economy and the trade regime results in product diversification. The corollary is that diversification cannot be an effective policy objective as such. The only diversification policy objective noted is that of market and product expansion or development in response to trade liberalization. Somewhat different conclusions are drawn for developing countries, where technology and its adaptation and transfer at farm level are often designed to address diversification away from traditional cropping methods and the industrial crops.

A different view of diversity and diversification is taken by Zilberman, Yarkin and Heiman (P), in exploring the parallels and differences between the emergence of medical biotechnology and new products and processes of biotechnology for agriculture. Of particular note is the conclusion that the complexity of institutional arrangements for approvals of these products and processes could substantially slow or impede the access by the agricultural community to productivity-enhancing opportunities. I would add my concerns again that acceptability to the body politic of biotechnology products and processes is an equally critical element.

REFOCUSING THE ROLE OF AGRICULTURE?

Our Elmhirst Lecturer, Yair Mundlak, offered us a tightly argued, theoretically rigorous and empirically substantiated discussion about the dominating role that

agriculture plays in the development of a nation's economy. His work builds on the extensive body of literature on economic growth, much of it coming from the World Bank over two or three decades. Productivity improvements in agriculture result in the release of labour from agriculture for employment in the non-agricultural sector, the decline in the proportion of the population required for local food supply, the creation of capital in both the agriculture and non-agricultural sectors and the strengthening of agricultural surpluses for export and regional trade. It is not a new conclusion, although it represents one of the most elegant statements of the proposition to date. Clearly, agriculture in all types of economies is of critical importance in addressing the theme of our conference.

The Presidential Address (Thompson, (P)) systematically reviewed each region of the world, exploring the resource constraints and opportunities, prospects for improvements in food security, the role of technology in these issues and the causality between food security and trade liberalization. He reaches similar conclusions to those of other papers at this conference, such as Pinstrup-Andersen and Pandya-Lorch: specifically, that with wise investment in research and development, technology transfer, human capital development, trade liberalization and improved civil institutions we can achieve global and regional food security. Some debates have taken place at this conference about whether the rate of increase in food supplies will lead to rising real prices or continue their long downward trend, although most experts appear to accept that global food adequacy can be achieved.

Certainly, it can be achieved. What is disturbing about this conclusion is that, even under the best of the supply scenarios of global food adequacy and decreasing real prices, we will continue to have an immense number of hungry people in the world in 20 years, the vast majority in rural areas. This is both an economic as well as a gigantic moral problem regarding the well-being of mankind, affecting not just the hungry, but each and every one of us.

Mundlak points out the central role that research plays in achieving productivity gains, the basis of overall growth, in agricultural and non-agricultural sectors. He notes the corollary that there is a strong argument for public funding in agricultural research both nationally and internationally, for both developed and developing nations. With the growing industrialization of agriculture and the consequent product differentiation through privately funded research, it is less clear that such agricultural research leads to the growth conclusion of Mundlak. This is particularly important where public funds are used in combination with private funds for this research. Requiring that public funds for research find matching private-sector moneys may increase overall spending on research, but it can also lower the amount of funding of public good research for agriculture. Both Canada and the United States, for example, are now urging public-sector research managers to seek private-sector matching dollars, directed to industry-driven research, the results of which can be captured in private benefits. The emerging products and processes of biotechnology are causing an acceleration of this trend. In the process, fewer dollars are left for purely public goods, for which no privately captured benefits can be found. Environmental issues represent a good example.

This is only one aspect of the growing endogeneity among governments, international institutions and the private sector in agriculture. We heard much

at this conference about institutions, both public and private, national and international, and their roles in agriculture, growth, policy establishment and food security. We have only begun to understand this complex set of arrangements which no longer allow the assumption of an exogenous government, remote from private-sector markets. Our theory needs expansion, empirical and qualitative evidence needs to be assembled, and our methodologies must be greatly enhanced. It is towards this set of issues that we must focus much greater attention.

REFERENCES

- Anderson, J.R. and Herdt, R.W. (1989), 'The Impact of New Technology on Foodgrain Productivity to the Next Century', in A.H. Maunder and A. Valdés (eds), *Agriculture and Governments in an Interdependent World*, Aldershot: Dartmouth.
- Campbell, K.O. (1983), 'Agricultural Economists and World Conservation Strategy', in A.H. Maunder and K. Ohkawa (eds), *Growth and Equity in Agricultural Development*, Aldershot: Gower.
- Hayami, Y. and Ruttan, V.W. (1971), *Agricultural Development: An International Perspective*, Baltimore: Johns Hopkins University Press.
- Maunder, A.H. and Ohkawa, K. (eds) (1983), *Growth and Equity in Agricultural Development*, Aldershot: Gower.
- Peacock, W.J. (1992), 'Key elements of modern biotechnology of relevance to agriculture', in G.H. Peters and B.F. Stanton (eds), *Sustainable Agricultural Development: The Role of International Cooperation*, Aldershot: Dartmouth.
- Thompson, R.L. (1995), 'Synoptic View', in G.H. Peters and D.D. Hedley (eds), *Agricultural Competitiveness: Market Forces and Policy Choice*, Aldershot: Dartmouth.
- Wossink, G.A.A., van Kooten, G.C. and Peters, G.H. (eds) (1998), *The Economics of Agro-Chemicals: An International Overview of Use Patterns, Technical and Institutional Determinants, Policies and Perspectives*, Aldershot: Dartmouth.