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INTRODUCTION

With this session the formal part of the first conference in the new millennium of the IAAE is coming to an end. In my view it has been an extremely successful and stimulating meeting. Holding the 24th International Conference of Agricultural Economists in reunited Berlin guaranteed an especially exciting environment. Inasmuch as this city is forward looking, the topic of our conference was dedicated to the future: 'Tomorrow's Agriculture: Incentives, Institutions, Infrastructure and Innovations'. The fact that our conference was the biggest the IAAE has ever held, in terms of the number both of presented papers and of participants, emphasizes that we as a profession remain highly motivated to contribute to solving the increasingly complex tasks facing world agriculture, rural areas, producers, food industries, consumers, natural resource managers and related policy makers.

Acknowledgments

Before attempting a synopsis let me immediately present some acknowledgements. The organization of the conference was terrific. The task of bringing together almost 1000 colleagues from around the world, with many spouses and companions, and providing them with an opportunity to meet, discuss and network was managed with excellence. Let me therefore take the opportunity to start with words of gratitude to all colleagues who contributed to the organization of this event. I want to thank the previous IAAE President, Douglas Hedley, for his guidance and leadership of the IAAE. During his presidency he masterminded important and timely change in management at a critical time for our profession. Having him as a colleague and friend serving as Past President in the executive committee for the next three years is reassuring for us. I also want to thank all other members of the executive committee for their service to our association.

The overall programme was designed by the Vice President Programme, Prabhu Pingali. He crafted a highly relevant agenda, intellectually sparkling events, a number of programme innovations, and a mixture of sessions and discussions addressing the major topics of the conference.

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The contributed papers were organized by David Colman, who did a massive job in selecting stimulating papers that met high academic standards. He persuaded about 80 reviewers to screen the 419 papers that had been submitted. We are grateful to all of them. There were 135 selected contributed papers, giving an increase of 22 per cent in comparison with those presented three years ago in Sacramento. The number of poster papers and computer demonstrations was higher than ever before, and I acknowledge the excellent work by Monika Hartmann, and her team, in orchestrating the respective sessions, which were well placed within the programme.

The discussion groups and mini-symposia continue to be a vital and integral part of IAAE conferences; they probably represent the best option we have to discuss specialized topics with peers from all over the world. I would like to thank Herbert Stoevener for managing this part of the agenda so well.

All essentials for making this conference possible 'on the ground' were provided by the local organizing committee led by Harald von Witzke, aided by the superb management of Ulrike Marschinke. We very much enjoyed being your guests for a week here in Berlin, and we all owe the local organizing committee an immense debt. All of us enjoyed the field trips organized by Jens Uwe Nagel. The whole conference went very smoothly, unequivocally showing the signs of professional planning. Local fund raising, coordinated by Konrad Hagedorn, was of great importance.

I also acknowledge the contribution and cooperation of Stefan Tangermann and his colleagues in organizing the German agriculture session and the respective book. The book gives an up-to-date analysis of agricultural issues in Germany, and in so doing it indicates the growing complexity of 'Tomorrow's Agriculture' in the host country. In this respect I would also like to express our gratefulness to the German organizing committee led by Ulrich Köester and the German Association of Agricultural Economists (GEWISOLA) and its chair, Friedrich Kuhlmann.

Last, but not least, I want to thank all financial supporters of this conference. As you can see in the programme, the list of sponsors from both the public and private sectors is long. For me this is another sign of the relevance of our profession far beyond a narrowly defined farm production sector. I would like to mention in particular support provided by the German Federal Ministry of Food, Agriculture and Forestry in Bonn and the Humboldt University here in Berlin. Other major sponsors are the German Technical Cooperation Agency (GTZ), the International Maize and Wheat Improvement Centre (CIMMYT), the French Ministry of Foreign Affairs, the Rockefeller Foundation, the Landwirtschaftliche Rentenbank (Frankfurt) and the Agricultural Ministry of the State of Brandenburg. There was also a long list of smaller sponsors.

PARALLELS BETWEEN PAST AND FUTURE

The title 'Tomorrow's Agriculture' suggests that we ought to be looking into the future. As Peter Sellers, actor and comedian, put it: 'futurology is the art of scratching, before it itches'. There are certainly numerous food and agriculture

issues which do not just itch, but rather seriously hurt: hunger, conflict over lands, governance and policy failures.

Prediction of what will happen in 'Tomorrow's Agriculture' cannot just be based on extrapolations. Agriculture continues to evolve from a sector with linear production–consumption chains into a complex system with many inter-dependent linkages. Douglas Hedley pointed this out in his stimulating Presidential Address. He stressed that we have to deal with a set of new participants who bring new rules of the game in agriculture policy. Douglas Hedley referred to 'citizen engagement', now demanded in policy formation and implementation at national and international levels. To analyse and model these changing systems, and their implications, poses a particular challenge for us. Douglas Hedley called upon us to serve society by providing information and analysis to governments as well as citizens generally. James Bonnen, in his visionary Elmhirst lecture, concluded that, as we are entering a fundamental transformation of the world economy, greater international collaboration of agricultural economists is required. Our profession must develop its human and institutional capacity and recognize that a broader education is necessary for agricultural economists. Obviously, we listened carefully to our distinguished Elmhirst lecturer and must find creative ways to respond to his calls under resource constraints.

When looking into the future we must also be looking into the past and asking ourselves: what can we learn from history? How to handle (and mishandle) globalization was also an issue early in the 20th century, and pathways to human welfare improvement out of food misery have also been travelled before. Indeed, some of the issues we are facing today may have parallels to those our profession faced 70 years ago. Let me refer to the last IAAE conference that took place in Germany, the third meeting of our association in 1934, which was moved from Berlin to the small town of Bad Eilsen to prevent exploitation of the international conference by the Nazi government. At that time the world was in a deep agricultural and overall economic crisis, and there were strong tendencies to block globalization in order to protect domestic farmers from exogenous price shocks and competition. We all know the terrible outcomes. The message of the Bad Eilsen conference, as stated in his concluding speech by then Vice President Max Sering, who was soon forced to emigrate to Canada, was that whatever separate nations might do is bound to fail without fair international cooperation. This message is at least as valid today as it was then.

PHILOSOPHICAL APPROACH AND PERSPECTIVES

The fall of the Berlin Wall ten years ago and the end of the cold war induced the start of economic transition in many former planned economies. This also set agricultural economics a task and indicated that our profession should assume a broader perspective in order to offer research results with strong explanatory power and advisory content. I am afraid we were rather unprepared, but we have been responding quickly with relevant research. The rise of

institutional economics in the 1990s has been a response to this need. However, even though institutional economics was already well developed on the eve of transition, we were not always successful in explaining what really happened and effectively guiding the reform processes. I would like to ask why this is so. Might the philosophical approach which implicitly is driving our research need a fundamental rethink?

Although the two expressions *modernism* and *postmodernism* were not explicitly mentioned during this conference, many discussions implicitly centred on the topics, starting with the pre-conference panel and the opening session. Let me briefly sketch what is meant by the two terms. Modernism is associated with the tradition of the Anglo-American 'Enlightenment' thinkers, who endeavoured to develop an objective science with universal morality, embracing the idea of progress and hence linearity. Modernists envisioned that modern science would promote not only the control of natural forces but also our understanding of moral progress, the justice of institutions and even human happiness. Modernists, therefore, claimed that political decision making should be based exclusively on expert statements.

Postmodernism, on the other hand, must be seen as a response to the failures of modernism in the 20th century. Postmodernism basically started to become a forceful school of philosophical thought in Europe in the 1970s and 1980s. Postmodernists argue that *science* is more broadly based, democratic, and/or backed by a media-mediated discourse in which opinions are considered regardless of the empirical proofs demanded by the positivists of modernism. This brings the involvement of interest groups and the broader civil society onto the policy agenda, an issue which was openly raised by Douglas Hedley in his Presidential Address and by James Bonnen in his Elmhirst lecture. It is certainly true that the involvement of a broader set of groups and people in decision-making processes increases transaction costs. But the economic cost of not taking public opinion into account can be much higher, as the WTO-related 'Battle in Seattle', the dispute about the Bio-safety Protocol and other examples demonstrate. In general, we may have to take on the new trade issues related to property rights and standards more explicitly.

However, in my opinion our capacity to evaluate and analyse policy would suffer if we turned excessively postmodernistic. The core concepts of our profession should continue to consist of intelligent theorizing, logic, sound empirical research and rationality, aspects which are much closer to modernism. Nevertheless, I find it important that we as a profession broaden our perspective and learn to deal with changing public attitudes and decentralized decision-making processes. We should be creative enough to pick from both modernism and postmodernism for the benefit of research quality and policy to advance the best set of opportunities.

Modernism has been rather uncritical of technological innovations; postmodernity, on the other hand, is latently anti-technology. Neither of these two extremes really moves us forward. Clearly, in view of the food problems which *must be solved*, technological progress and its widespread acceptance will be essential for advancement of humankind. Agriculture is increasingly a science-based sector in most parts of the world. While our debates on biotech-

nology here were of excellent quality, we need to make ‘communication’ and ‘risk perception’ an integral part of the research agenda if we want to be relevant in the technology debates.

DISTRIBUTION OF PAPERS BY THEMATIC AREA

Before addressing the new and relevant facts that we have been exposed to during this conference that has focused on the four thematic ‘Is’ – institutions, incentives, infrastructure and innovation – let me present some statistics. Of course the definitions of these four thematic areas partly overlap, so that a clear-cut separation is difficult. Nevertheless, an attempt has been made to categorize the papers presented (that is, plenary, contributed and poster papers). About 13 per cent of papers had to be left aside, but the remainder fell into the following distribution:

- 27 per cent of the papers dealt primarily with incentives;
- 49 per cent fell into the category of institutions;
- 5 per cent referred to infrastructure; and
- 19 per cent of the papers dealt with innovations.

Evidently, institutional economics, including incentives, has become mainstream agricultural economics and has complemented the neoclassical paradigm which governed our profession for decades. No monolithic economic paradigm will be able to explain and analyse an increasingly complex and context-specific world. As we come to know more and more about ‘the world’, the reduction of reality to a few theoretical propositions becomes less and less convincing. Our fear of the pitfalls of generalization, however, must not turn us into story tellers. A theory-guided focus in our institutional research, including attention to the role of legal aspects and the judiciary for agricultural systems performance, could still be strengthened. The hot issues of land reform in Africa and in the transforming economies have been discussed here, but more in-depth policy research is called for.

In the remainder of my synoptic view I will briefly highlight some of the major propositions with respect to the four ‘Is’ which emerged from the meeting.

Incentives and institutions

The multitude of papers addressing incentives and institutions are intrinsically linked. Authors seem to agree that prices are the engine and institutions the grease. Incentives can always be conceptualized with the idea of ‘prices’ and it is today common to equate ‘institutions’ with both formal laws and rules and with the informal set of norms, traditions and cultural backgrounds which govern markets.

During the learning workshop on ‘Food Security’, D. Gale Johnson – a new honorary life member of the IAAE – was asked what importance he would

attribute to the role of institutions for food security. He reported that, at the meetings of the IAAE in India in 1958, development perspectives for Africa were considered the brightest of the three major continents that were, at that time, regarded as the developing world. Latin America was next, but there was pessimism about Asia. Today we must acknowledge that this ranking has been reversed. D. Gale Johnson explained that the high expectations raised in the 1950s with respect to Africa were based on the much better person–land ratio of the continent at that time. We now know that resource endowments seem far less important, while institutions and policies have been more decisive in shaping the success of many countries in Asia.

Of course, this is a rough generalization and much more was said during the conference, for instance, on the timing and sequencing of institutional change. In fact, one of the mini-symposia organized by Gertrud Buchenrieder had more or less this title. Case studies presented in this mini-symposium highlighted the fact that the neglect of informal institutions by policy makers is often responsible for resistance to, and the unsuccessful implementation of, reforms. To identify and quantify the impact and effects of informal institutions will be an important task for our profession in the future in an attempt to provide policy conclusions which have the potential to be successful in a world that, using the words of Douglas Hedley, is becoming less coherent because of increasing complexity, horizontality and increased citizen engagement.

Looking at the catchword ‘institutions’, one could be tempted to assume that institutions are the only force driving our economies. This is clearly not the case, and the presenters at the conference highlighted the role of providing the proper incentives ‘up front’. Alberto Valdés –another new honorary life member of the IAAE – for instance, stated that food security in Latin America has greatly improved during the last decade. The major force driving these developments was the reduction of macroeconomic distortions and, in particular, exchange rate distortions. The same phenomenon was mentioned by Ashok Gulati who, in his talk, ‘Market Reforms in South Asian Agriculture: Will they deliver?’, highlighted the overwhelming importance that macroeconomic reforms had and have with respect to India. Scott Rozelle and Jikun Huang argued in favour of gradualism, based on China’s experience, a statement that remained controversial.

Infrastructure

As I have already mentioned in the grouping of papers, the thematic area of infrastructure appears to have been somewhat underrepresented, given its key role for rural growth. True, studies on rural infrastructure are not new to our profession. But still, the economic importance of basic infrastructure, such as road services, public transport and irrigation facilities, is evidenced by the high rates of return associated with related investments. Looking at roads, Shengen Fan pointed at ‘win–win’ outcomes with both productivity growth and poverty reduction. Apart from the more traditional public or quasi-public goods, we will also have to broaden our notion of infrastructure to include the provision of services that can improve the access of rural populations to new technolo-

gies. The existence and performance of national agricultural research and technology delivery systems as well as information and telecommunication services are good examples. Widening rural–urban disparities can only be avoided if we make sure that the countryside is connected to new technological developments through appropriate infrastructure. The poster by Mitch Renkow and Daniel Hallstrom also reminded us in a conceptual way of the important general equilibrium effects of infrastructure investments. The linkages of such effects are not yet sufficiently understood and require further research. Infrastructure remains an important area for agricultural economists. It is disturbing that investment in rural infrastructure is not only low but declining in many low income countries, as stated by Peter Hazell.

Our research seems to continue to have a strong land bias and underemphasizes water. This relates to taking water (not just irrigation) more explicitly into account in our research. We should have water policy issues more prominently on the agenda in South Africa.

Innovations

Let us come to the last of the four ‘Is’: innovations. In the resource-scarce situation faced on our increasingly crowded globe, technology and innovation are actually the keys to sustainable development. Julian Alston and Phil Pardey certainly challenged our notions of the very high internal rates of return to agricultural research investments, and I am sure that their paper will provoke discussion far beyond the confines of this conference. Ruben Echeverría, in his comment on the paper, called for a broader look at the issue of the role of research in agriculture. I think both are partly right and we ought to link profitability assessments with modelling endogenous growth in order to get on top of things in this area. Still, many of us find it worrying that public investment in international agricultural research and development is dwindling, despite allegedly very high returns on investment. Convincing policy makers and the public of the importance of spending on agricultural innovation will certainly be possible only from a strong research base.

There should be little doubt that sustained agricultural research is of crucial importance for a sufficient crop supply, stable world market prices and thus global food security. But what are the major research directions to be invested in? What are the technologies that will have major impacts on future developments? In general, information and communication technologies (ICTs) are considered to be one of the key technological areas in the early 21st century. Interestingly, however, only a comparatively small number of conference papers dealt with ICTs. Examples are the contributed paper of Abdul Bayes related to village telephone initiatives in Bangladesh, and the plenary paper by George Norton and Scott Swinton related to the use of ICTs in precision agriculture.

Another important area of innovation is certainly biotechnology. Most of you may have realized that during this year’s conference there were many more papers and presentations relating to it than three years ago in Sacramento. Around one-third of all papers presented during this meeting in the innovation

category explicitly tackled aspects of biotechnology, and many more papers dealt with the topic in a more implicit fashion. Biotechnology has many features that distinguish it from previous technologies, so that simple extrapolation based on past technological experience is probably inappropriate. As Walter Falcon pointed out, institutional innovation is definitely required at various levels to harness fully the potentials of biotechnological innovation. The importance of the private sector in research is huge and increasing, and public organizations have to adjust to this situation. Yet, as stressed in the invited panel session on agricultural research organized by Derek Byerlee, institutional adjustment in the private sector should not mean a reduction of public investment; there are many important technological areas which are not covered by the private sector. Instead, more public-private research partnerships are required, which have to be based on comparative advantage. A particular challenge in intersectoral partnerships certainly remains the identification of suitable frameworks for intellectual property rights that help to improve the access of poor farmers and consumers to proprietary technologies. Yet institutional innovation is also needed with respect to biosafety, food safety and biotechnology communication in the public arena. These institutional issues underline that we cannot assume a straightforward and linear relationship between research, technology and innovation.

We would manoeuvre ourselves into a reductionist corner of irrelevance if we viewed these trends and concerns, which also will affect trade, largely as new protectionism in disguise. Things are becoming more complex, and the importance of regulatory policies and other institutional issues is rising and needs to be reflected in our curricula. In particular, this is also a methodological challenge, which has not yet received sufficient attention from our profession. How can we model and explain increasingly complex interlinkages? Evidently, technological innovation requires not only institutional but also methodological innovation, so important to address properly the future of agriculture.

In that respect, as an aside, we ought to ask how many of the presented papers actually looked into the future. While many did discuss matters of long-run relevance, not more than 10 per cent of the presented papers explicitly dealt with prognoses or simulations of expected future developments. Systematic approaches to catch early trends in consumer behaviour, innovation pathways, and the emerging complex linkages and systems which replace the notion of the food chain, are needed.

CLOSING REMARKS

Let me conclude by stating that this conference has been a vibrant market place for new ideas and facts on how to shape agriculture's role in the future. I call upon you to address the future more explicitly. As a profession we must recognize the need to make use of a variety of theories and paradigms in order to explain better the role of 'Tomorrow's Agriculture' and play a role in shaping that future. Let us take a little dose of postmodernism home from Berlin: let us continue to look for 'the truth', while recognizing that there may

sometimes be different perspectives on the truth, and its relevance, and linkages are often less linear than we may have thought for too long.

The IAAE Council yesterday again installed a highly diverse executive committee, with members standing for the multitude of research paradigms, which will serve the association as an effective team.

The sustainability of the success of this conference will depend on our individual ability to use this new knowledge constructively. After all, our constitution requests us (I quote), 'To foster the application of the science of agricultural economics in the improvement of the economic and social conditions of rural people and their associated communities; to advance knowledge of agricultural processes and the economic organization of agriculture; and to facilitate communication and exchange of information among those concerned with rural welfare throughout the world.' We can proudly state that this conference was much in line with our IAAE objectives.