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Editorial

International Agricultural Research Systems

Jock R. Anderson and John L. Dillon

Department of Agricultural Economics and Business Management, University of New England, Armidale N.S.W. 2351 (Australia)

Technical change and the research processes that so importantly underlie much such change have been under accelerating scrutiny by agricultural economists in recent years. Hardly an issue of the journal *Agricultural Economics* appears without featuring new reports of the endeavours of economists in furthering understanding of the economics of agricultural research.

This Special Issue brings together several papers that relate to the general theme of agricultural research, particularly its international dimensions but not to the neglect of national activities. The late 1980s are and the early 1990s surely will also be a period of active ferment concerning policies for investment in agricultural research. The Consultative Group on International Agricultural Research (CGIAR) is, for instance, in the process of considering its expansion to include a much wider set of activities than it has encompassed to date via its existing 13 International Agricultural Research Centres (IARCs) which have constituted a fairly stable system in recent years. It is thus an appropriate time to reconsider some of the many issues that policy makers must deal with in considering investment in agricultural research, whether of national or international orientation.

While donor-funded international agricultural research is surely tremendously significant in itself and as a catalyst, and represents considerable ongoing investment of the order of about US$ 300 million annually, it is still small relative to the aggregate of investment in national agricultural research programs. It is thus appropriate to set the scene in this Special Issue by reviewing the recent and present structure of public support for agricultural research in national systems. Pardey, Kang and Elliott draw on recently assembled data of a relatively comparable nature to examine several features of a considerably sized sample of National Agricultural Research Systems (NARS). Several hypotheses have been advanced about the organisation and structure of NARS, and these are examined in their cross-sectional tabulation of summary data about the size and importance of research expenditures in countries of diverse size and agro-ecological setting.

While some countries are spending what seem to be considerable and increasing amounts on research, many others languish with small and weak sys-

tems which are probably not highly productive and represent severe cases of persistent under-investment (Oehmke, 1986). Many of the problems of national systems derive from operating on a scale that is simply too small to enable effective economical operation. Nowhere are such problems greater than in the South Pacific Island Countries (SPICs). Some of these peculiar problems, which relate also to small land-locked countries in Africa and elsewhere, are critically reviewed and discussed by Hardaker and Fleming.

Several of the political economy issues raised by Pardey, Kang and Elliott are returned to in the next group of three papers. Some donor governments face particular problems in continuing to support international agricultural research activities. The United States of America is a very significant donor (contributing something more than one-quarter to the operation of the CGIAR centres and most other international agricultural research initiatives). The difficulties of fostering political commitment to continuance of such support are addressed by Cummings and Dalrymple. They have been careful observers of both the international system and the domestic debate about such development assistance, and present a cogently argued case for continued U.S. support for international agricultural research – not only on the basis of informed altruism but also for reasons of national self-interest.

The particular question of how agricultural exporters such as the U.S.A. and several other industrial countries are influenced by agricultural growth in the countries that receive development assistance to help agricultural productivity is addressed by Kym Anderson. He develops a convincing argument that, rather than any harm being done to the rich countries that export agricultural products, they tend to benefit through the growth that they may be able to foster in their poorer neighbours.

Yet another international dimension of agricultural research is taken up by Brennan. He examines the question of how international agricultural research products that are intended primarily for developing countries may find their way to unintended targets of IARC investment. The particular case examined is that of CIMMYT-based semi-dwarf wheats in Australia. Brennan demonstrates that Australia has benefited considerably through the adoption and exploitation of such materials in Australian wheat breeding programs. The spillover benefits thus generated considerably overwhelm the contributions that the Australian Government has made to both CIMMYT itself and the CGIAR system in general.

The final group of four papers are concerned with a diversity of other issues that relate to international agricultural research. The first of these, by Hayami, Kikuchi and Morooka, looks at the way in which investment in rice research is responsive to changing market signals. In the theory of induced innovation, great importance is attached to relative prices of factors and outputs in steering the course of research investments. It is, thus, not surprising that these authors find that, with an appropriate lag structure, world rice research is indeed highly

responsive to the real price of rice. This would not be a surprising result with more industrially oriented agricultural products but it is reassuring to observe that research markets also 'work' for a staple commodity so basic to the nutrition of so much of the world's population.

Several distributional aspects of technical change are dealt with by Haggblade and Hazell in their consideration of recent and contemporary issues in the measurement of linkage effects that serve to transmit the impacts of changing agricultural technology beyond the first line of beneficiaries of agricultural research. Their focus is on Asian and especially African agriculture, the latter having been something of a Cinderella in the international comparison of national research productivities and of successes associated with the IARCs. The model that they propose provides a framework for reviewing their survey of the limited but growing empirical work on the dynamics of rural developing economies and enables them to isolate the effects of different types of technological advances in the linked sectors of such economies.

The next issue reviewed in this Special Issue is that of some of the review and planning procedures used for the international agricultural research centres. It is vital for continued efficient investment that the review processes work effectively. Through such means, the research train can be kept more or less on the right rails as the international agricultural research system, with its NARS partners, takes up the challenges posed by biotechnology, sustainability and the greenhouse effect. While the focus of Fuglie and Ruttan is on review procedures used on IARCs, the messages are applicable to research institutions of all types and certainly their observations have direct applicability in many NARS. Just as it is appropriate to lead up to the conclusion of this Special Issue on a note of self-appraisal and the need for continued vigilance in research management activities generally, it is valuable to conclude with the forward-looking and thought-provoking contribution by Lynam and Herdt. They take a carefully-considered 'hard-questioning' approach to the topical issue of sustainability and its handling in international agricultural research.

This canvassing of so many issues in one not-so-slim Special Issue is necessarily partial. Nonetheless, it is our belief that these papers bring the contemporary state of the art of agricultural research into sharp focus from an economic perspective and provide much cogent information for research administrators working at both national and international levels. Such work is never easy because decision makers must continue to deal with many profound uncertainties and even occasional obscurantism. Decisions can, it is our fervent hope, respond favourably to the provision of better information and the sharing of such information between all parties to the research process, whether these be donor-community members or research managers working at grassroot levels in national programs. We look forward to readers sharing our interest in these contributions.

Reference

Oehmke, J.F., 1986. Persistent underinvestment in public agricultural research. Agric. Econ., 1: 53–65.