

# Book Review

**Agriculture in Developing Countries—Technology Issues.** By Keljiro Otsuka and Kaliappa Kalirajan. 2008. Sage Publications Pvt. Ltd, London, UK. 172 p. Hardcover 29.99 GBP (\$43.28), ISBN 9780761936626.

Combining indigenous knowledge of farmers with modern agricultural technologies to create a participatory development is the central idea of this book, which in fact is a compilation of papers presented at the 26th Conference of the International Association of Agricultural Economists, held in Australia from 12 to 18 August 2006. The editors tried and succeeded in selecting interesting papers which, at least most of them, show convincing examples of how to combine the contrasting elements of traditional farmer knowledge with modern, scientifically based technological approaches in one strategy. The book is divided into eight chapters including an introductory chapter written by the editors themselves and hence describes seven specific research projects carried out independently in six Asian countries.

The introductory chapter discusses the known phenomenon of gaps between researcher and farmer yields, but also the farmers' own yield gaps, i.e. the non-realization of site-specific yield potentials due to management reasons. According to the editors, farmers' indigenous knowledge and modern scientific knowledge are not substitutes for each other, but are complementary towards achieving the objective of improving the welfare conditions of the farming community. The introductory chapter ends with a summary of the following papers, however neither in the correct order nor complete (no summary of chapter 3).

Chapter 2 entitled 'Economic assessment of an indigenous technology in Bangladesh' describes a case study, which demonstrated the importance of developing scientific research in unfavorable areas while taking into account the local experience of the farmers as well. The authors have assessed the economic efficiency of the 'double transplantation' system for rice applied by local farmers and compared it to a single transplantation system commonly practised in Bangladesh. It was possible to identify environmental conditions under which one of the systems turned out to be more favorable.

In chapter 3 'Research investment on technology development in Peninsular India', the authors try to evaluate the economic value of research in Karnataka, a predominantly agricultural state in India. Based on their calculations they conclude that agricultural research considerably affected the release of improved varieties and other technologies that, for most species, increased crop productivity. Likewise,

the rate of return of research investments was dependent on the crop species.

In chapter 4 'Impact of forage options for beef production', the authors examine the influence of the crop-cattle technology on improving economic conditions in China. By analyzing data from smallholder households of 11 villages in two Chinese provinces it could be shown that the strategy of establishing mixed farming systems, including both ruminant husbandry and fodder crop production, can be an economically profitable option for smallholder households in China.

Chapter 5 entitled 'Optimal land use with carbon payments and fertilizer subsidies in Indonesia' is a well written concise economic report dealing with alternative land use options targeted on increasing carbon sequestration by including small-scale forestry and agro-forestry with traditional maize growing in Sumatra. The authors developed a meta-model of an agro-forestry system and incorporated it into a dynamic programming algorithm to determine profit-maximizing management strategies in the presence of carbon payments and fertilizer subsidies. Based on various sophisticated models and calculations, the authors concluded that the main determinants for farmers are the initial carbon content of the soil and fertilizer prices, as well as the presence/absence of carbon payments.

The following chapter entitled 'Deterioration of tank irrigation systems and poverty in India' analyzes in detail the impact of changing irrigation from traditional tank to modern pump-based systems in Tamil Nadu, India. The authors further discuss the economical and social implications of the current decline of collective management of irrigation systems and the subsequent emergence of private wells with limited access for users. Based on extensive data evaluation of rice yields and profit on rice, the authors conclude that 'the dissemination of private wells results in double tragedies in that the non-well users suffer increased poverty due to the decline in collective management of tank irrigation systems; even the well users suffer reduced profit on rice due to the overexploitation of groundwater'. The study is completed by a discussion of policy implications, giving some clear suggestions on how to overcome the water scarcity problem by revitalizing collective management of irrigation systems.

Chapter 7, named 'Agricultural technology and children's occupational choice in the Philippines', is a long-term analysis of the impact of increased income generation by using modern agricultural technologies, mainly modern rice varieties and irrigation, on schooling investments. The

authors used a rare panel dataset collected in 1985, 1989, 2001 and 2004 in the rural Philippines. In particular, the authors explored the changing importance of agricultural technology, land and human capital in determining household income and schooling investment decisions over time. Based on a large set of empirical data and a concise evaluation, the authors conclude that ‘overall the regression results give evidence that modern agricultural technology significantly affects children’s progress in school’ and that ‘the fact that school progress is significantly affected by household income indicates that schooling remains a superior good in the rural Philippines’.

The last chapter of this book is dedicated to ‘A panel data model for the assessment of farmer field schools in Thailand’. The authors developed and applied a sophisticated model that includes a wide range of data on farmers’ knowledge on rice and pest management as well as on rice yields and pesticide use. They analyzed whether and to what degree the participation in farmer field schools (FFS) can contribute to a reduction of pesticide use via teaching and knowledge transfer to farmers. The results of the study showed that FFS farmers significantly succeeded in reducing their pesticide use (–41.7%), while maintaining the overall crop productivity. The analysis has been carried out by testing for change in performance in the growth of environmental impact parameters, namely the quantity of pesticides used and the environmental impact quotient (EQI). Again the farmers participating in FFS showed a better performance. The authors conclude that the

participation in FFS ‘can help farmers to sustainably change pesticide-use practices’.

All in all, this book is an interesting and well-written source for people interested in the rural development of developing countries in Asia, even if it is mainly based on economic models. No need to remind the reader that the value of economic models in general is mainly a function of the quality of the data that have been used. In any case, all contributions are concise and abundantly supplied with empirical data clearly shown in various tables and graphs. Most of the papers are also easy for non-economists to understand, while some others seem to be exclusively targeted on agricultural economists, leading to the question, ‘For which audience has the book been written?’ Also, the selection criteria and the presentation order for the papers are not conclusive. An adequate use of the results, especially by policy makers and advisors in developing Asian countries, would certainly need another way of presentation and the integration of further factors, such as policy. Whenever considering a practical application of the research results in the various countries, the further integration of other stakeholders, such as crop production experts, would also be useful.

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