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**BOOK REVIEW: Pingali, P.L., M. Hossain, and R.V. Gerpacio. *Asian Rice Bowls: The Returning Crisis?* New York: CAB International; and Manila, Philippines: International Rice Research Institute, 1997, 341 pp., \$100.00 hardcover. ISBN 0851991629.**

The International Rice Research Institute (IRRI) has a long and distinguished history of fostering outstanding contributions to the economics of agricultural development (e.g., Hayami and Ruttan; Barker and Herdt; David and Otsuka). Pingali, Hossain, and Gerpacio continue the tradition with *Asian Rice Bowls: The Returning Crisis?* This book provides a timely summary of the state of Asian agriculture as that continent reaches a new stage of development. The shift to middle-income, urbanized economies is proceeding rapidly and raising new challenges to agricultural development. *Asian Rice Bowls* provides a uniquely integrated overview of these issues, which are diverse and complex—including sustainability of Asia's most productive land; the shift to knowledge-intensive agriculture; increasing scarcity of labor, land, and water; externalities from pesticides; continued population and demand growth; and increasingly open world markets.

The first part of the book's title, *Asian Rice Bowls*, refers to the intensively cultivated lowland rice areas of Asia, which have been the source of most productivity gains during the past generation. The question raised in the second part of the title—*The Returning Crisis?*—refers to the shifting balance between growth in Asian rice demand and growth in supply. The authors make a strong case against the complacency that has set in following the successes of the Green Revolution in the 1960s and 1970s, a complacency that has reduced investments in rice research and in irrigation infrastructure. They contend that demand will continue to grow in absolute terms in Asia for some time due to population increase and modest income-led increases in per capita con-

sumption. More importantly, they report that supply growth is slowing down even faster. This is the result of declining productivity in Asia's lowlands, combined with declining profitability of rice production. The authors argue effectively for renewed attention to rice research and infrastructure investments.

*Asian Rice Bowls* starts by reviewing the well-known story of how Green Revolution investments in new varieties, irrigation, and fertilizer led to spectacular gains in Asian rice productivity. But the authors bring this story up to date by discussing more recent technical changes in response to rising real wages and the need for more knowledge-intensive, location-specific management. Then the authors put these productivity gains into perspective with thought-provoking evidence that intense paddy cultivation may be unsustainable, and furthermore, that the externalities from pesticides threaten human health. The middle third of the book is devoted to assessing future Asian rice demand and supply in the context of GATT and the forces leading to agricultural diversification. The final portion of the book examines the various forces that will shape change in the future, including increasing factor scarcity, new seed technologies, new management techniques for fertilizer and pesticides, and increasing mechanization.

The book makes several unique and valuable contributions to the agricultural development literature. First, the research assessing sustainability and externality issues associated with intensification of Asian rice is both path breaking and thought provoking. This award-winning research has been published elsewhere, but never before summarized in one volume that puts the findings into a larger con-

text. The results from this research challenge many widely held views about intensification and point to new directions for future rice research in Asia. The approach also provides a model for assessing these issues in other major agricultural systems of the world.

A second research contribution is the exploration of knowledge-intensive agriculture. The worldwide trend toward this type of technical change in agriculture reflects the declining gap between research station yields and farmers' yields. *Asian Rice Bowls* articulates in detail what knowledge-intensive agriculture will mean at the field level for Asian rice and why it is necessary. The book explores the role of human capital, markets for services, and public policy in the application of knowledge-intensive agriculture. Again, this approach could be a model for assessing these issues in other kinds of agricultural systems.

An unusually successful blend of economics and biology supports these research contributions. This is evident both in the chapters on sustainability and those examining future technologies. For example, the sustainability research was conducted in collaboration with agronomists at IRRI, and the pesticide health externalities were measured in collaboration with medical doctors. These unusual collaborations provide concrete biological results that are the basis for the economic assessments. The chapter examining future seed technologies provides summaries that are accessible to social scientists, detailing how and why yield potential may grow in the future. It is unusual to find this kind of material so well integrated into economic analysis of market trends.

Another valuable contribution of *Asian Rice Bowls* is that it draws together many data series and case studies from across Asia that were previously unavailable to international audiences. The summarization of major trends from farm-level data in many countries is an important contribution from these IRRI economists. Where else, for example, can we obtain a picture of the evolution of farm wages in different Asian countries over the last 35 years? These kinds of data provide scholars of agricultural development with a true picture of macro trends.

At the other extreme, the generalizations are well illustrated by specific case studies at the micro level. One example is the discussion of competing demands for land. Brown has alleged that urbanization in Asia will reduce cultivated area and threaten the ability of Asia to sustain past production gains. *Asian Rice Bowls* explores these issues in a balanced way, drawing on specific studies in three Asian countries. A case study from the Philippines is reviewed in detail to illustrate the economic forces at work. This type of detail from the micro level enhances our understanding of macro trends.

A minor criticism of *Asian Rice Bowls* is that the chapters on world trade and future demand and supply are not as original as the analyses of farm-level trends. While they provide solid overviews of these issues, other studies have covered these particular topics in greater depth. There is relatively little analysis of the degree of protection or the role of government intervention in rice markets. From a policy perspective, the book's strengths are in the well-grounded discussions of technology, environmental, and input policies.

The book is highly readable, and provides excellent charts, tables, and text boxes that communicate the findings to a wide audience. Although there is some overlap among the chapters, this permits each chapter to stand alone as a summary of a particular issue. The accessibility of this material and the focus on agriculture make *Asian Rice Bowls* a useful resource for teaching. The charts and case studies could provide lecture material for undergraduate courses on the world food economy. The readability and level of the material make this book a useful addition to readings for upper-division or graduate agricultural development courses. Individual chapters could be assigned to demonstrate particular aspects of Asia's agricultural development or future development challenges in middle-income countries.

Both scholars of agricultural development and of rice commodity markets will find *Asian Rice Bowls: The Returning Crisis?* to be a useful reference. It provides a highly readable overview of the world's most important food

crop in the world's most populous region. Moreover, it reports path-breaking research that is redefining issues surrounding agricultural technology and development.

Laurian J. Unnevehr

*University of Illinois at Urbana-Champaign*

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