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ELSEVIER

Agricultural Economics 26 (2001) 185–189

AGRICULTURAL
ECONOMICS

www.elsevier.com/locate/agecon

Book reviews

Agriculture, Trade and the Environment: the Impact of Liberalization on Sustainable Development

John M. Antle, Joseph N. Lekakis and George P. Zanias (Eds.); Edward Elgar, Cheltenham, UK, 1998, US\$ 95, Hardback, ISBN 1858987830

This book contains papers presented at a 1996 conference held at the University of Crete. The theme of the conference was European agriculture, trade, and sustainability. The book is divided into four parts. Theoretical and methodological issues are considered in Part I and for some readers this part may be the most useful aspect of the book because the models and ideas developed are not specific to the European Union, but could be applied to almost any country. For example, in Chapter 1, Panos Fousekis presents a trade model with two countries, two factors, a single commodity, and process-generated pollution to demonstrate that global pollution might rise or fall as a result of trade liberalization. Factors that might raise or lower the global pollution level are identified. The analysis indicates that freer trade is expected to increase pollution in the exporting country and reduce it in the importing country. Whether aggregate pollution increases or decreases is ambiguous, and depends on the relative sizes of the two countries and production technologies. The diagrammatic treatment makes it an ideal chapter to present to upper level undergraduates, while the algebra allows the material to be used by post-graduates.

The second chapter describes an approach to assessing the economic, environmental, and human health trade-offs associated with the use of agricultural technologies. The authors: John Antle and Susan Capalbo, present a more disaggregated approach than that typically used by agricultural economists to examine environment–agriculture trade-offs. They note that their analysis is consistent with the way a soil scientist

might approach a problem involving the leaching of a chemical from a soil, since the soil scientist would use regional and not a “national average” soil type. Pesticide use in the Andean potato–pasture production system and dryland agriculture in the northern plains of US are two cases studies used to illustrate their methodology. Briefly, this method involves developing separate models: one for the on-farm production decision, another for modeling the impact of on-farm input use on the environment, and a third for modeling the effects of farm inputs on human health. While the approach outlined by Antle and Capalbo provides a valuable framework for considering the trade-offs, they point out that the data requirements to actually complete the analysis are demanding. Therefore, their approach is unlikely to be widely used in empirical research, but their conceptual framework is still relevant.

Abler and Shortle use European agriculture as a case study in Chapter 3, which is entitled *Decomposing the Effects of Trade on the Environment*. They say that significant shifts in agricultural production patterns among countries are likely with agricultural liberalization. Since agricultural pollutants have effects that can be very site- and time-specific, production changes in response to changes in trade rules will have far-reaching environmental effects. A two-commodity general-equilibrium framework is used to decompose the environmental impact of trade-induced production changes within a country into five mutually exclusive and exhaustive categories: scale (how much is produced); mix (what combinations of commodities are produced); externality (there are production externalities but no consumption externalities in the model); policy (there are changes in environmental and other public policies induced by trade) and technology (the adoption of new production processes and

technologies). The chapter does not present empirical results, but the discussion makes it clear that assessing the environmental impact of trade is a difficult task. The authors point out in their conclusions that “the effects about which we know the least, and the effects most commonly left out of trade-environment analyses — externalities, policy, and technology — could be the most important” (pp. 67–68).

Part II of the book analyzes the issues discussed in Part I in the context of European agriculture. Chapter 4, authored by Floor Brouwer and Siemen van Berkum, has as its title *Effects of CAP Reform on the Environment in the European Union*. The authors point out that the agricultural sector in EU is a primary polluter of European waters due to fertilizer and pesticide use. While this pollution has been of concern to the public, to government officials, and to politicians, the authors note that agriculture has also helped conserve nature. They outline the objectives of the CAP and describe the effects on the environment of reforms carried out in the cereal and beef regimes in the early 1990s.

Carpentier, Guyomard and Le Mouel in Chapter 5 examine the consistency between environmental and competitiveness objectives of agricultural policies. They construct a model of a single-product farm with fixed land stock of heterogeneous quality. The model allows for different production technologies and the problem becomes one of allocating land among these different technologies. Comparative statics are used to show the effect on land-use intensity in the crop sector when changes occur in key price-support policies, land set-asides, and per-hectare compensatory payments. The results indicate that yields and intensity of land use are likely to decline with reductions in support prices, but that the set-aside program might offset part of this effect.

In Chapter 6, entitled *EU Agriculture and the Economics of Vertically Integrated Markets*, Steve McCriston and Ian Sheldon present a model consisting of several stages of production/value added, imperfect competition at each stage, and product differentiation at the retail stage. The important result from their model is that as the food chain (or any stage in it) becomes less competitive, the greater the increase in firms' profits and the smaller the change in consumer surplus following price reform. They apply their model to the UK processed-cheese sector. When mar-

ket structure is assumed to be perfectly competitive, a 30% reduction in the price paid for milk by the processing sector results in an increase in consumer surplus of £ 142 million. With a monopoly at each stage, the increase in consumer surplus is only £ 35 million. The authors conclude that analysis of policy change should consider market structure, and try to “more accurately characterize the features of the specific food market under consideration. . .” (p. 129).

The experiences of Austria (Chapter 7), Scotland (Chapter 8), Italy (Chapter 9), Spain (Chapter 10) and Greece (Chapter 11) are discussed in Part III. Sinabell uses an econometric model to investigate the link between pollution and government transfers to farmers in different Austrian regions. The results suggest that regions where the transfers were the greatest also had the most pollution, but because of the complexity of the problem, Sinabell argues that further research is needed on this issue. Hanley, Kirkpatrick, Oglethorpe and Simpson focus on the conservation of Scottish moors. An LP model is developed and applied to data collected from 13 farms to investigate the payments that would need to be made to sheep farmers to reduce stocking rates to maintain the moors as a tourist resource. A farm-specific payment system is explored. Loseby examines the impact of the Uruguay Round on the agro-food sector and the rural environment of Italy. She explains that concerns about the effect of the Uruguay Round on Italian farms center around fears of income losses and the ability of agriculture to compete domestically and internationally. Regional data are used to show that the southern and central parts of Italy are the most vulnerable to reduced government support. Loseby notes that the Italian farm sector is able to produce high quality products, and that the home market places importance on quality. Therefore, demand may be insensitive to the price competition associated with reduced trade barriers. Varela-Ortega explains that irrigated agriculture consumes up to 80% of all water resources in Spain, occupies only 15% of agricultural land, but produces 60% of the value of agricultural production and 80% of exports. Using programming models and regional-level data, Varela-Ortega finds that the CAP reform of the early nineties tends to shift agricultural production to less-intensive systems, producing less nitrate emissions and an improved environmental outcome. According to Lekakis, environmental problems in Greece

are related to production inputs, particularly fertilizer that enjoyed subsidies until the late 1980s, and to imported pesticides. Productivity indices for fertilizers and pesticides were calculated for 1971–1995 using a translog cost function. The productivity of chemicals was found to have fallen over the study period. Lekakis suggests that farmer demand for chemicals has become less responsive to price, as farmers have become more dependent upon chemicals. The findings of this chapter support the argument that in Greece chemical use in agriculture has been environmentally damaging and unproductive.

Part IV contains two chapters. The first, Chapter 12, examines agriculture and the environment in Estonia, a transition economy. The authors, Tim Phipps and Paavo Eliste, note that Estonia has moved rapidly from a centrally-planned economy to a free-market economy. It also has an extensive area of wetlands used as a waterfowl habitat and as a recreational resource by its citizens. Factors discussed in the chapter that affect agriculture and wetlands include property rights, capital markets, policy uncertainty, and trade relations. An important conclusion is that while the opportunity cost of preserving wetlands is currently relatively low, with more efficient land markets and capital markets, and more international trading opportunities for agriculture, this opportunity cost will rise, possibly leading to reallocation of wetlands to other activities. The final chapter of the book, by George Zanias, considers prospects for European agriculture as well as a retrospective view. Zanias traces the policy developments, pointing out that when the CAP was set up, placing the burden of support on consumers was relatively easy because post-war food shortages and high food prices were fresh in the minds of consumers. The 1992 reforms, the most radical up till then, gave a greater role to the market and tried to satisfy consumer and environmental concerns. Zanias concludes by saying that the CAP of the future will differ sharply from that of the past. Large farmers will derive less of their income from the CAP, and new entrants to farming will never be provided with subsidies anything like those given to present-day farmers.

From this summary of the book's contents, it is obvious that a lot of ground is covered. While common threads run through the chapters, different analytical frameworks are presented providing a wealth of ideas for any researcher interested in assessing linkages be-

tween agriculture and the environment. The book is excellent, and I suggest that others with an interest in the linkages between trade and the environment from a research as well as a policymaking perspective would agree with my assessment. My only criticism is that details of the methods employed in some of the chapters could have been presented in more detail in appendices to the chapters where the models and results were discussed. Each chapter is an excellent source of references, another attractive feature for those considering purchasing the book.

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PII: S0169-5150(00)00126-2

Out of the Shadow of Famine: Evolving Food Markets and Food Policy in Bangladesh

R. Ahmed, S. Haggblade and T. Chowdhury (Eds.),
The Johns Hopkins University Press, Baltimore,
MD, USA, 2000, 344 pp., US\$ 70 (hardback)
ISBN 080-1863333, US\$ 35 (paperback) ISBN
080-1864763

In 1971, Henry Kissinger, then the United States Secretary of State, referred to Bangladesh as a "basket case". Rather undiplomatic, the statement seemed plausible for a country with immense population pressure, 80% of its population below a bare subsistence poverty line, average per capita income of US\$ 100, massive floods, and home to some of the greatest famines in recorded history.

In 1998, Bangladesh received one of the largest floods in its history. Amidst dire prediction there was no famine. The very aptly named *Out of the Shadow of Famine* explains why and, more important, how. The explanations are not simple. They derive from internationally supported agricultural research systems, public policies that facilitated the rapid spread of new technology, opening of markets to international trade in rice, massive investment in roads by the government

and foreign aid donors, a public food-distribution system that evolved with the times and played an important role throughout, and foreign aid support for that distribution system. Most important the circumstances changed over time, and the government adjusted its policies to those changing circumstances. Perfection no, but no famine either.

The book spells all this out with copious data, meticulous analysis, and broad coverage. The book grows out of a long history of policy research in Bangladesh by the International Food Policy Research Institute (IFPRI) with which one of the authors of this book has been closely associated throughout. IFPRI worked with the Bangladesh Institute of Development Studies (BIDS), and its predecessor institutions for all of this period. This book, with four major parts and 14 chapters, is written largely by senior researchers at IFPRI and BIDS. That gives it a solid base in data and experience and the best of credentials.

Part I of the book provides careful analysis of the changing structure of food supply and demand. It is notable that food grain production doubled from 1971 to the mid 1990s. Even more striking, marketing of food grains increased by six times. Thus, not only did the supply of food increase but the supply became much more subject to commercial forces. That at once weakened the capacity of the government to control supplies and strengthened the extent to which opening up markets, both domestic and international, could improve food security.

The increase in food production was a product of the green revolution, particularly introduction of fertilizer and water control responsive rice varieties into the dry season. Production of Boro (dry season) rice was negligible until the new IRRI rice varieties became available. By the mid-1990s, Boro rice accounted for 7.5 million tones or 40% of total rice production. While not spectacular overall, growth in food grain production exceeded population growth by a significant margin.

That success was not due to technology alone. The length of paved roads doubled, an essential, as other IFPRI research shows, for agricultural growth. But, many other institutions were expanded as well, including educational and credit systems. Subsidies of several types, which eventually got out of hand, and were then drastically reduced, played an important role in speeding the spread of technology and its input

complements. Markets were made to operate better not only by roads that reduced costs and increased competition, but also introduction of grades and standards which in turn made accurate price information possible, further increasing competitive forces. The positive role of government in facilitating development of competitive markets was critical to the later success in using markets to help achieve food security.

Part II provides a detailed history of interventions in food markets including exposition of the legal framework, the role of foreign aid donors, and the dynamics of policy change. Contrary to current fashions, food aid gets good marks not only because of its important role in making markets work better by providing roads, but also in supporting the public distribution system when it was essential. The leverage from providing so much food aid also facilitated a strong donor role in encouraging and assisting in policy reforms. Those reforms changed the role of food aid and food subsidies to suit the newly developing circumstances in which free markets could do much of the job with a small but important residual for public intervention.

The public food distribution system consumed 17% of the national budget at its peak in 1990. Such a level of expenditure was not viable over the longer term. Some system for targeting the poor would be needed. Raisuddin Ahmed provides a detailed, thoughtful discussion of targeting and its implications. He first states the problem: two-thirds of the deaths of children under five are related to malnutrition, 50% of the rural population are land less and dependent on intermittent wage labor for income, a requirement of US\$ 2.6 billion annually to bring the underfed population to minimum calorie intake and less than one-tenth of that amount is available.

Targeting to the poorest seems essential, but read the book telling the story of a poor family left out of the targeting and weep. The ingenuity of private operatives in beating the system for private profit is also described. The chapter is filled with detail. Rural rationing is quite cost ineffective: 6.6 taka of cost for each 1 taka to a target household. Most effective is a rural maintenance program that employs destitute women to maintain roads at a cost of 1.3 taka for each taka received by beneficiary households. While food in kind raises costs by 25%, in-kind payments increase food consumption more than cash payments. The conclusion from the detailed analysis is that programs

must be adapted to changing circumstances, which the Government of Bangladesh has been willing to do, and local participation is helpful in speeding such adjustments.

Part III provides detail on the changing case for government intervention. What makes sense at one point in time must be changed to suit quite different times. There are two importune caveats for donor conditioning of policy in weak developing countries. First, the timing of policy change is critical to its success. Normally the right timing is a political question and difficult for foreigners to judge. Thus, there must be close cooperation between outside sources of pressure and internal realities. Second, much growth can occur while policy changes are underway — they can be made gradually with good timing.

Food security should not be tackled in any country without fully digesting the wealth of experience over a long period of time and radically changing circumstances that are detailed in this study of Bangladesh. The book does not provide a magic formula to apply elsewhere, but the experience will help avoid expensive mistakes and suggest the outlines of successful programs.

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