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Book reviews

Agricultural Landownership in Transitional Economies

Gene Wunderlich (Ed.); University Press of America, Lanham, MD, 1995, vii +147 pp., US\$ 42.50, ISBN 0-7618-0065-4

Many of us that are interested in — but not specialists of — socialist agriculture have been wondering why the transition from the socialist collective farming system to the individual system based on private property rights in land has been so slow and, hence, unsuccessful in raising agricultural production and productivity in the Central and Eastern European countries and the former Soviet Union. This short volume presents a collection of essays on the achievement of and the obstacles to landownership reform in these transitional economies. Analyses are neat but cover many of the key issues regarding the economic transition. There is no doubt that this book provides a useful and compact assessment of the present state of the landownership reform. It is also noteworthy that discussions leading to this volume were initiated at the 22nd Conference of Agricultural Economists in Harare, Zimbabwe, in 1994.

The agricultural sector is undergoing dramatic changes in most of the countries in the transition to a market economy. State ownership of land is shifting to private ownership. Yet 'privatization' of land is complicated and elusive, because it does not necessarily imply the transfer of land from state to individual cultivators. In Russia, for example, most land has been transferred from state to collective ownership, but the transfer to individual farmers has yet to be implemented in many areas. Moreover, Thiesenhusen (Chapter 2) observes that peasants do not seem to prefer individual farming when given a choice and, hence, even though land is distributed to individu-

als in the form of paper shares, this is not followed by physical allocation of individual entitlements. In Central and Eastern Europe, strong political pressure exists to restitute land to former owners or their heirs, many of whom are not farmers and do not possess adequate technological and institutional means for farm cultivation. Land recipients in this region have often opted to join farmers' production associations or production cooperatives. In Russia, too, agricultural production cooperatives are common, which are little different from collective and state farms in terms of the way work is organized. Riddell (Chapter 5) argues that newly independent farm families have few places to turn to for farm machinery, seed supplies, fertilizer, sales of produce, credit, extension, and so forth, based on the experience of FAO member states in transition.

In my view, there are four major issues in landownership reform in transitional economies: (1) the slow implementation of landownership transfer, (2) the failure to establish family farming, (3) the absence of positive productivity impact of reform, and (4) the future of landownership reform.

The difficulty in implementing the restitution is identified as a major reason for slow implementation of landownership transfer. The required documents are often missing and the government officials making decisions regarding the validity of applied documents are in short supply. Thus, Müller (Chapter 6) predicts that completion of the restitution will take several decades.

The restitution poses a difficult transitional issue, because the heirs of previous owners do not know farming. As is pointed out by Munro-Faure (Chapter 4), there seems to have been a presumption in the transitional economies that, even if the restitution distributes lands to non-productive users, market transactions transfer lands from low to high productive users.

Land markets, however, do not function precisely because of the incomplete implementation of land reform or the failure to establish private property rights in land. Therefore, a land tax is considered necessary to ensure productive use of land and to induce sale by non-productive landowners. Considerable attention is, therefore, paid to the issue of land tax in this volume.

The failure to establish private or individual farming is explained most importantly by the absence of an efficient marketing sector as well as the lack of organizations providing credit and extension services to individual farmers. Authors almost unanimously argue that large-scale group farming will remain prominent, given the lack of markets and farm support services. It is true that without efficient marketing and farm support services, individual farming cannot be practiced efficiently. It is by now well-established, however, that, other things being the same, collective farming is less efficient than family farming, because of the high supervision cost of collective farm workers.

This point has been most lucidly demonstrated by the experience of the introduction of the household production responsibility system in China and Vietnam, in which farm productivity improved dramatically as farm organization shifted to individual farming. Interesting enough, collectives continue to provide marketing and other services to individual farmers in these countries. As Lerman (Chapter 3) suggests, if marketing is costly for individual farmers, they can form service cooperatives or retain the service functions of collective organizations while creating and maintaining individual farming. Indeed it is reported that, as in the case of China and Vietnam, private farming on auxiliary plots, as well as private farmers, depends on state marketing channels in the transitional economies under consideration.

Therefore, the absence of markets and farm support services alone cannot explain the prevalence of collective or group farming. Theoretically, a more reasonable explanation is the inadequate knowledge of farm operation possessed by collective and state farm workers, not to mention heirs of previous owners. The editor (Chapter 1) states that the cooperative represents a unique form of farm organization enabling dispersed entrepreneurship and asset ownership to capture economies of scale and fully utilizing resources in transitionally short supply. Another explanation is offered by Riddell, that new private farms

are likely to be subject either to the restitution or to multiple claims in future, so that little progress can be expected until land reform is completed. It appears that why private farms have failed to develop remains to be explored further.

Although private farms have been established to a limited extent, landownership system has undergone remarkable changes and a number of new joint producer groups have been formed. Compared with the experience of China and Vietnam, however, the productivity gains in the countries this volume covers have been minuscule. It is true that the agricultural sector suffered from the general economic disruption. The lack of productivity gains may also simply reflect the slow progress of reform implementation. Lerman (Chapter 3) argues that the difference in the patterns of agricultural transformation between the former socialist countries of Europe and Asia is not surprising, given the much higher level of mechanization and technology in the European countries. This important argument, however, is not elaborated further. The editor also points out that arguably, land reform is more a matter of equity than productivity, more justice than efficiency. The basis for this argument, however, is unclear.

In fact, a variety of farm organizations coexist in the transitional economies, ranging from the traditional socialist farms with auxiliary plots to new agricultural cooperatives and new private farms. Furthermore, private farms have continued to exist during socialist periods in the Eastern European countries. A comparative analysis of farming practices and productivity among the different farm organizations can provide us useful information as to the actual impact of landownership reform and its future. For example, it is instructive to know whether farming on auxiliary plots continues to be much more productive or profitable than collective farming. If the answer is affirmative, what is the obstacle to further expansion of private farming on auxiliary plots? This issue is relevant, because the establishment of individual farming in China can be considered conceptually as an expansion of private farming on auxiliary plots. Another important question is concerned with the difference in productivity between private farms and the new agricultural cooperatives. Specifically, are there differences in input use and the choice of crops between them? If such analyses are supplemented by the analy-

sis of the choice of farm organizations, we will be able to obtain much better understanding of the future of agricultural organization in the transitional economies.

In conclusion, the authors of this volume predict that group farming will continue to be dominant farm organization in the foreseeable future in Central and Eastern Europe and the former Soviet Union. Such conclusion, however, is not convincing, because of the lack of supporting evidence. It seems to the present reviewer that there is a good possibility that individual family farming will develop, securing marketing and support services through collective organizations.

I fully recognize the limited availability of statistical data necessary for rigorous empirical analyses in the context of the transitional economies, so that it is probably unfair to criticize the lack of rigorous analyses in this volume. I would like to point out, however, that the contribution of this volume would have been much greater if the synthesis of the findings and arguments were provided in such a way as to stimulate future research in this frontier area of investigation in our profession.

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Maize Technology Development And Transfer: A GIS Application For Research Planning In Kenya

Rashid Hassan (Ed.); CAB International, Wallingford, UK. Published in association with the International Maize and Wheat Improvement Center (CIMMYT) and the Kenya Agricultural Research Institute (KARI), 1998, 230 pp., US\$ 85.00 cloth, ISBN 0851-992-870

The staff of most national and international agricultural research organizations recognize the importance for research design and impact analysis of integrating

the efforts of social and biological scientists. Often, however, this 'integration' occurs on an ad hoc basis, as the confidence of individual scientists in the work of colleagues from other disciplines grows over time, and one discipline (or scientist) 'informs' the other. Unfortunately, the principal purpose of economic analysis in agricultural research is sometimes narrowly identified with documenting 'successes' or explaining 'failures' after the research occurs.

A major contribution of this book is to demonstrate how technology development, impact analysis, and priority setting can be integrated *analytically* by developing models from the same brass tacks—a digital database incorporating spatially-referenced information on agroclimate, population density, cropping intensity, on-farm trials, and farmer surveys. The most immediate gain to this approach is the refined definition of maize breeding environments in Kenya. The analysis revealed an extensive zone of maize production (some 45% of Kenya's maize growing area) whose agroclimatic characteristics were not adequately reflected in the targeting scheme then in use. The revised zoning explicitly identified and mapped a 'transitional' environment within the established mid-altitude and highland environments, thus providing breeders with more specific guidelines for addressing a significant need for new maize germplasm.

Keying data on crop production environment to information on the perceptions of farmers, farmer characteristics, input use, and management practices can result in more targeted recommendations that have immediate application to the work of a national research program. For example, most adoption studies are conceived and implemented in the absence of agroclimatic or soils information; even when this type of information is recorded by social scientists, their 'taxonomies' may not be conformable to those of biological scientists. The geographical information system (GIS) framework enables these variables to be moved from the unexplained (error term) to the systematically explained (explanatory factors) portion of the socioeconomic model.

While the merits and impacts of the GIS database are evident throughout the book, the description of the database itself is relatively limited. The power of a digital (GIS) database is that any number of spatially referenced, thematic layers of data (climate, soil,

production, prices, etc.) can be juxtaposed rapidly in more or less complex ways over which the analyst has control. This provides the exciting possibility of delivering not only problem-specific maps (e.g. the precise geographic fit of a new germplasm), but also a complementary set of spatially-related attribute variables. These can then be used, as was done by the authors, to support a broader range of agronomic and socioeconomic analyses.

The book reveals but does not elaborate on the apparent tension between the maize breeders' reliance on the elevation variable and the capacity of the GIS to provide more specific information on the spatial distribution of temperature. The authors indicate at various points that reliance on the elevation proxy variable was an underlying cause of the inadequate classification of maize zones that had guided previous breeding efforts. Nevertheless, both temperature and elevation were subsequently included in the cluster analysis that underpinned the core maize zoning work.

This example illustrates that the analytical power and flexibility of GIS alone do not solve the tricky issue of selecting the most appropriate decision variables. How to juxtapose them creatively is another issue. For example, the cluster analysis was performed using 19 variables for each 5 km grid cell (6 monthly values of precipitation, maximum and minimum temperatures for the main growing season and elevation). Much weight was placed on the ability of the cluster analysis to account for within-season climate variability, but cluster analysis does not retain the temporal relationships between variables. The inclusion of a more complex variable such as length of growing period (LGP), which is constructed by explicitly modeling the temporal interaction of climate variables, may have been more exact and efficient. Using LGP would also have resolved another acknowledged problem that the selected six months did not correspond to the onset and length of the rainy season(s) in several important regions of maize production. As the authors acknowledged, they left much that still could be done with the tools they developed.

In some other cases also, the studies summarized in the chapters might have been more fully developed in and of themselves. For example, the chapter on variety adoption includes, in addition to a regression analysis based on the factors that are usually considered, a wealth of details on farmer's ranking of traits,

references to genetic diversity and variety turnover. These data are not exploited, however, in the regression model. But if there are shortcomings in individual chapters, they are largely outweighed by the benefit to applied researchers of seeing the range of analyses that stem from a single database. These include: (1) ex ante research evaluation and priority setting; (2) adoption of different types of maize material; (3) the efficiency of fertilizer use; (4) determinants of *Striga* infestation; and (5), the effectiveness of extension services.

This study occurs at a key juncture for maize research in Kenya and other nations in sub-Saharan Africa. As is pointed out in the book, discussions of maize research impact in many countries of sub-Saharan Africa have shifted from whether farmers adopt high-yielding germplasm to how to better target germplasm development. Those who fund research have shifted their emphasis to natural resource management, and a critical issue is how to integrate agricultural productivity and sustainable resource management into strategies for increasing national food production. Databases and methodologies of this type play an important role in this integrating process because they link productivity to the analysis of environmental and resource issues. They can be used to analyze such issues as the pace of resource degradation and changes in soil fertility, the economic incentives for maintaining agro-biodiversity, and the spatial diversity of transgenic materials. The tool developed in Kenya has also been employed to monitor poverty. Despite their potential, such structured approaches may be threatened by the current emphasis of donors on decentralized, participatory approaches to research.

The book is worthwhile reading for research planners and applied researchers particularly those whose work requires them to take a more strategic perspective because it provides an overview of the utility of an integrated approach and offers insights into the nuts and bolts of its development and application. Deeper issues that cannot be addressed in a single volume are the extent to which efforts of this type can be sustained and replicated in other national agricultural research systems. The central role of GIS capacity as both an organizational and integrating framework was perhaps under-emphasized in the volume. Some discussion of the institutional and resource implications of providing this type of capacity in other developing countries

would also have been useful. In the long run, the economic returns to investment in such databases depends very much on their upkeep and the extent to which national researchers have both the capacity and incentives to conduct research in an integrated fashion.

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Famine In Africa: Causes, Responses, and Prevention

Joachim von Braun, Tesfaye Teklu and Patrick Webb,
Johns Hopkins University Press for the International
Food Policy Research Institute, Baltimore, 1999, 238
pp., US\$ 39.00 cloth, ISBN 080-186-1217

Famine remains a disturbingly real threat in this era of plenty, perhaps nowhere more so than in Africa south of the Sahara. The devastating famines in the Sahel and the Greater Horn in the mid-1970s and again in the mid-1980s and mid-1990s induced unprecedentedly intensive research across the social sciences on the etiology of widespread severe undernutrition and private and public responses to such episodes. Amartya Sen's 1998 Nobel Prize in economics partly reflects the quality of scholarship in this area over the last quarter century. Scholars' understanding of the causes of and appropriate ex ante and ex post responses to famine has progressed markedly. Yet, scholars with more than just an academic interest in undernutrition and famine must confront the ongoing need to improve laypersons' and policymakers' understanding of concepts, models and empirical regularities now familiar to serious students of food security and famine. This new volume by von Braun, Teklu and Webb takes a significant step toward meeting that need.

The considerable virtue of this book lies in its clear presentation of core issues and principles in

relatively uncomplicated language and with a wealth of well-chosen examples. It directly debunks traditional myths surrounding famine—that it largely reflects adverse climate shocks, that crop failure is the proximate cause, or that it is the natural, Malthusian result of growing human populations—using both intuitive and empirical arguments. The authors emphasize that famine reflects unsettled socio-political systems characterized by endemic poverty and risk, and that famine must be understood as the conjunctural consequence of accumulated structural weaknesses and a social or natural shock. Famines neither arise nor retreat suddenly. Concerted efforts by communities, national governments and international donors to remedy structural deficiencies ex ante, in advance of famine, are universally acknowledged to be the preferred approach, but are terribly difficult to achieve in practice.

In the main, this difficulty arises because famine typically strikes where markets, states, and production technologies are all weak. Variability in local, rain-fed agricultural production would be less of a problem if markets with ample supporting infrastructure ensured sufficient food availability in times of local shortage. Equally, segmented and thin food markets would threaten less if agricultural production technologies in use insured ample local food supply. And these two interdependent problems commonly stem in part from government errors of nonfeasance or misfeasance. Governments at war with their own people prove especially unable to guard against famine, and in some egregious cases use food as an instrument of aggression against the state's internal enemies. One empirical weakness in this volume is that the authors understate the effect of civil conflict on the incidence, severity and duration of famine, including in places like Ethiopia, Sudan and Zimbabwe, which the authors discuss in considerable detail.

Most famine strikes in rural areas, although famine's effects impact urban areas through migration and marketing links. Since their own labor power is often the poorest's only asset, increased and less variable rural labor productivity is perhaps the single most important intermediate objective in the struggle to end famines. This point might have been given a bit more attention in the fourth chapter, on production failures. Likewise, the importance of child health, nutrition, and education—which raise these

individuals' adult labor productivity-to the long-run prevention of famine is somewhat underemphasized. This underemphasis may feed economists' unfortunate propensity to treat nutritional status solely as an outcome, not as a state variable influencing future productivity and welfare. Chapter 7, on individual households' natural preventive and responsive behaviors in the face of varying degrees of food insecurity, drawing heavily on the authors' own field experiences in Ethiopia, Sudan and Zimbabwe, offers a good synthesis of the literature on coping strategies available. The authors do an excellent job of capturing the dynamism of the food insecure's endogenous responses to threat without overstating the limited capacity of the poor to resolve fully these problems themselves.

Although the authors indicate they wish to "enhanc[e] the theoretical basis of the debate [on famine] ... and [enrich] the theory through empirical fact finding", it is apparent that neither sophisticated theorizing nor methodologically advanced empirical inquiry were their priority. One can easily pick holes in the relatively simplistic and dated empirical methods employed in the chapters on agricultural production and food marketing, where typographical errors in several equations may also frustrate readers who want to learn the models for the first time. And the vast majority of the empirical findings have been previously reported elsewhere. This book is not a map to the formal, methodological or theoretical research frontier on famine. But the authors usefully identify key areas in need of further advanced research, notably improved understanding of the functioning of rural labor and food markets, effective targeting strategies, the cost-effectiveness of relief operations, and capacity to predict the onset of complex humanitarian emergencies that increasingly absorb the human and financial resources of development agencies.

The strength of this volume lies in its compact and clear presentation of a mass of useful concepts and findings scattered across the disciplines and often buried in an inaccessible grey literature. The authors focus heavily on policy and program issues. The chapter on that subject is as long as the book's first five chapters combined, underscoring the intended audience. von Braun, Teklu and Webb's volume deserves to be widely read by activists, policymakers, practitioners and students looking for a lucid synthesis of

the complex and disturbingly current reality of famine in Africa.

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Agricultural Biotechnology and the Environment

Sheldon Krinsky and Roger Wrubel, University of Illinois Press, Urbana-Champaign, IL, 1996, 294 pp., US\$ 18.95, ISBN 0-2520-6524-7

Over the past decade biotechnology has evolved from a research area to an industry. Applications of biotechnology in agriculture are second only to uses related to human health, and the rate of innovation is such that even an attentive bystander easily becomes confused. This book responds to an obvious need for a wide ongoing survey of biotechnology used in agriculture.

The scope of the subject matter is very broad, comprising herbicide tolerant crops, insect resistant plants, disease resistant crops, transgenic plant products, microbial pesticides, frost-inhibiting bacteria, animal growth hormones (especially Bovine Somatotropin), and transgenic animals. Economic and cultural aspects are also addressed.

The diverse topics are linked in this book by a question that pervades the whole discussion: will biotechnology fulfill its early promise of ameliorating the environment by providing substitutes for artificial chemicals as herbicides and insecticides, and by reducing the burden of harmful wastes by increasing feed conversion efficiency? Given the infancy of the industry, any conclusion on this score must be premature. But the early promise of unambiguous reduction in chemical use has not been fulfilled in the evolution of the industry to date, as described in this book. Herbicide tolerance genes in crops directly increase use of the relevant herbicide; whether this is more than fully

compensated by a reduction in other, more harmful, herbicide applications is the crucial question. In the long run, the answer may hinge partly on the rate of transfer of herbicide-tolerance to weeds, which could result in greater use of more harmful herbicide in the future. Similarly, plant pest resistance due to Bt genes might reduce current pesticide use, but might hasten the onset of resistance in insects and thus the use of more dangerous pesticides in the future. Bt resistance will also pose problems for pest control programs of organic farmers who rely on Bt applications for pest control. Bovine growth hormone (BST) reduces feed use and production of animal waste, but some fear that it will induce greater incidence of mastitis and increase the contamination of milk by illegal antibiotics.

The great strength of the book is its comprehensive coverage of the issues. In this fast-moving field I know of no other similarly comprehensive survey. But its very scope means that achieving accuracy on all the facts and issues must stretch the competence of even two authors. As an economist, I found that the coverage was weak and superficial on economics issues. For example, arguments that various forms of biotechnology will hasten the trend towards fewer, larger farms are too casually accepted. Most biotechnologies from BST to organic pesticides require more high-quality managerial attention by farmers to individual animals and fields. In the past, consolidation into large-scale or plantation-style agriculture has proceeded farthest in crops where the production technology is simplest and the managerial demands are low. If the past is a good guide, managerial complexity will favor family farming.

On the other hand the recent intensification of contract production of poultry, and the current dramatic changes in pork production are being driven by economies of coordination in processing and marketing and perhaps by the gains from internalizing the benefits from productivity enhancing research. The implications of biotechnology for these types of production system merit more attention than is given here.

As is too common in discussions of biotechnology in agriculture, benefits of production efficiency to consumers are all but ignored in this book. Price, productivity, yield and consumption do not appear in the index. In the text, a possible drop in price of milk due to BST is viewed negatively, as a threat to farmers,

with no mention of benefits to families and children via lower food costs and possibly better nutrition due to higher consumption. The issue is not whether these benefits would outweigh possible negative implications for consumer welfare, such as increased exposure to growth hormones or antibiotics in milk, or even increased cholesterol intake due to higher consumption levels. The key point is that the possibility of positive effects on consumers does not even get a hearing.

This bias in favor of the interests of producers (farmers) is commonplace and 'politically correct' in the literature on agriculture, but contrasts sharply with work on the pharmaceutical industry. Consider the reaction to a book on the effects of biotechnology on the pharmaceutical industry that evaluated innovations solely with respect to their effects on drug producers' welfare and on possible harmful side-effects on users, while ignoring their positive effects on consumers' health and health costs. Such a work would be rejected by most political activists as unacceptably biased, and by economists as missing the main positive elements of the net social value of pharmaceutical innovations. Yet in studies of agricultural biotechnology, lingering agrarian sentiment, and justifiable respect for the integrity and independence of farmers, allow a similar blindness to the existence, let alone the possible primacy, of positive consumer interests to go generally unremarked by the guardians of 'political correctness,' even though consumers with most at stake are in the poorer and less privileged part of the population.

Given the range of disciplines covered in this book, it would be unfair to judge its accuracy and balance solely on the basis of its economic content. As a spot check on the quality of its treatment of other scientific areas, I asked my colleague Steve Lindow, a pioneer in the area of frost-inhibiting bacteria, to scan the chapter devoted to this subject. Unfortunately, he found that the authors appear to have made numerous errors in the details of their coverage. They confuse a hundred field trials of naturally occurring bacteria with two or three trials of genetically altered bacteria, they miss by years the timing of initial discoveries, and they confuse scientific and procedural issues in covering the regulatory delays. This lack of reliability on the details is a pity, as such a comprehensive monograph could, if accurate, be a wonderful reference to the state of agricultural biotechnology in all

its applications. In fairness, it is good to keep in mind the enormous challenge faced by authors who attempt to piece together, from primary sources with varying degrees of objectivity, an account of all aspects of agricultural biotechnology and its environmental effects.

Despite the above shortcomings, the book deserves serious consideration by economists interested in agricultural biotechnology. It offers an informative and wide-ranging, if slightly blurred, view of a fast-moving and exciting field. It is highly readable

and well-organized. I will value it as a permanent addition to my professional bookshelf.

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