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## BOOK REVIEWS

*MIDAS, A Bioeconomic Model of a Dryland Farm System*. By R. S. KINGWELL and D. J. PANNELL (eds). (Pudoc, Wageningen, 1986.) Pp. 207, ISBN 90 220 0913 0.

This book is a documentation of the MIDAS model. MIDAS, or 'Model of an Integrated Dryland Agricultural System', is described as a whole-farm mathematical programming model of the agricultural system in Western Australia's eastern wheat belt. It is the product of a collaborative effort by a multi-disciplinary team including economists, agricultural scientists, farmers and computer programmers. The book comprises eight chapters authored by the team members and deals with the development of the model, its description, solution interpretation and its application.

In the first chapter, Morrison reveals that the purpose of the MIDAS project was to provide a whole-farm model which complemented the growing interest in the farming systems approach to research and extension. It is a bioeconomic model and includes complex biological and ecological components as well as economic components. The model is designed to answer questions posed by researchers and extension workers from a whole-farm perspective and according to a profit-maximising objective function. It is presently used by research and extension officers of the Western Australian Department of Agriculture.

Several matters relating to systems modelling and modelling techniques are discussed briefly in the opening chapter. Mathematical programming was preferred to dynamic simulation because of its advantages of efficient optimisation and its provision of extra economic information (notably shadow prices). A brief introduction to mathematical programming techniques is included to acquaint readers with the basic concepts, language and conventions used in subsequent chapters (readers are referred to other texts for more details). Models building procedure and testing are discussed including the modellers' solution to the trade-off between detail (size and complexity) and expense of running and maintaining the model. To solve this problem, potential end users were involved from the project's outset.

In Chapter 2, Kingwell presents a detailed description of the MIDAS model. Although a bioeconomic model, it is a compromise between economic and biological relationships, neither specified in as much detail as in a purpose-built economic or biological model. It is a mixed integer programming model of 280 activities and 150 constraints. Non-linear relationships are approximated by linear segments. Implicit consideration is given to soil conservation and leisure goals as well as to the overall objective of profit maximisation. This chapter is supported by two appendixes, one containing a complete listing of MIDAS activity and constraint names, and the other a listing of the data in MPS format. This is the main reference chapter in which the model's principal activities and constraints are described.

In Chapter 3, Pannell and Falconer describe some technical aspects of the solution of the MIDAS model. They discuss interpretation of the solution, particularly shadow prices and costs, and slack variables. The final

section of this chapter deals with model revision. Revision files were created using spreadsheets. An example of a spreadsheet file is included in an appendix. Revision datafiles for the five applications are included in an appendix. The model itself was solved using the APEX-IV algorithm on a Cyber mainframe computer.

The remainder of the book (Chapters 4 to 8) presents particular applications of the model, involving changes to various parameters. The first (Chapter 4) is concerned with 'crop-livestock interactions and rotation selection'; the second (Chapter 5) is an 'economic comparison of alternative lambing times'; the third (Chapter 6) is 'the profitability of lupin: cereal rotations'; the fourth (Chapter 7) is 'optimal strategies for deep ripping of soils'; and the fifth (Chapter 8) is 'costs and benefits of alkaline treatment of cereal residues'. Most of the procedures used in these applications are documented in the first three chapters with references made to the appropriate sections.

The five applications presented illustrate the capabilities of the model and provide useful insights into the specification and solution of particular farming decisions and problems. The value of the systems approach to modelling farm management decisions is evident from the applications.

This book is largely a documentation of the MIDAS model, prefaced with a brief discussion on farming systems modelling, choice of modelling technique and solution interpretation. It is presented in an easy to read, non-mathematical style for economists and non-economists who are not necessarily familiar with farming systems modelling and/or mathematical programming. The chapters are well structured and there is a useful index and list of references. Each chapter is prefaced with a brief summary and there is substantial cross-referencing between the chapters.

Almost half of the book is devoted to data appendixes, sufficient enough to reproduce the model and each of the applications discussed. At first glance, the book appears of value only to research and extension workers operating in the eastern wheat belt of Western Australia. However, it is also of some use to others, including those new to farm-level modelling and farming systems modelling, especially where there is an interest in including biological/ecological relationships as well as economic relationships. The book could have served this latter group better with more detail on the systems approach to farm-level modelling and more discussion on alternative modelling techniques applicable to this situation. References are provided. Greater use of the applications presented in Chapters 4 to 8 to illustrate the strengths of the systems modelling technique would have enhanced the general discussion on modelling.

On balance, the book leans more towards potential users of the MIDAS model than to those interested in farming systems modelling and mathematical programming models. However, it would be a useful reference text for researchers and modellers interested in the development and application of farming systems models and the use of mathematical programming techniques in agricultural decision making.

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*Rural Development: World Bank Experience, 1965-86.* By OPERATIONS EVALUATION DEPARTMENT, WORLD BANK. (World Bank, Washington, D.C., 1988.) Pp. 132, ISBN 08213 0983 8.

Dollars don't make sense! For billions who continue to live in poverty in the less-developed countries (LDCs) the World Bank's evaluation of its rural development programme gives little hope. Twenty-two years and US\$20 billion later the world has seen no significant improvement in poverty alleviation. What happened? Why has the World Bank failed?

This is a powerful treatise of the failures and successes of the World Bank's rural development programme. A no-holds-barred account, it is a story of the World Bank's early struggle with conceptualising rural development, the mistaken belief that rural development meant poverty alleviation and the later specific targeting of smallholders in efforts to reduce poverty. Of the 574 rural development projects financed by the World Bank from financial years 1965 to 1986, 192 projects were evaluated and the findings are summarised in this report. The report concludes with profiles of selected rural development projects in Brazil, Mexico, Sri Lanka, Nigeria, Malawi, South Korea and West Africa. Annexes include a discussion of, and statistical data on, World Bank lending for agriculture and rural development projects. No other report so vividly portrays the actual achievements of the World Bank's rural development strategy. The report is essential for development economists, aid donors, development banks and international development institutes.

In the early 1960s, the World Bank embarked on a new strategy to help alleviate poverty in LDCs. It called it the rural development programme. Large-scale projects were implemented initially. Apart from economic growth, the central theme was to alleviate rural poverty. However, the manner in which growth and equity were addressed in most projects was confused, leading to conflicting project objectives, so much so that even the World Bank staff engaged on many projects were unclear about the project outcomes. Not surprisingly, many projects failed. About 50 per cent of the evaluated projects in Sub-Saharan Africa have failed and only a minority succeeded to some degree. Irrigation projects have generally prospered.

Many lessons can be learnt from the World Bank experience which would be applicable to other development banks and aid donors, such as AIDAB. Targets were often too ambitious and in many cases the benefits were clearly unsustainable. Contrary to assumptions, viable technical packages were frequently either not available at all, were not properly identified, or were of only modest potential. The poorest of the rural poor, the landless and labourers, were not addressed in any of the projects. Many projects were victims of severe implementation constraints and macro-economic problems, apart from institutional, management and human resource problems. Greater differentiation among regions and countries, with some selectivity of project types and more pilot projects in many cases, could have resulted in better approaches and projects. Process approach, which provides for continued appraisal and evaluation from project identification through completion, would have been a better procedure to use in almost all projects. Involvement of local communities and target groups in project design and implementation would have enabled a greater degree of impact.

No concrete solutions are given to the problems of poverty alleviation in the LDCs in this report. The emphasis is on what the World Bank ought not to do. However, as the report indicates, a first step in correcting any mistake is to recognise that mistakes have existed in World Bank programmes. For this I think the World Bank can be commended. We do need self evaluation.

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*Agricultural Environments: Characterization, Classification and Mapping.*  
By A. H. BUNTING (ed.). (CAB International, Wallingford, Oxon, 1987.)  
Pp. 335, ISBN 0 85198 582 3.

Not many agricultural economists will find this book gripping. However, those whose research leads them to look closely at the environmental factors likely to influence agricultural production should find the book a very good starting point. The book provides a good summary of many of the methods currently being used to classify agricultural production environments and a good source of references which will facilitate more detailed reading.

The book contains the papers from a workshop held in Rome from April 14-18, 1986. It was organised by the International Agricultural Research Centres in collaboration with FAO.

Apart from an introductory section which includes the welcoming addresses by the organising institution representatives, the book is made up of four main sections. A final fifth section summarises the major points from paper discussions and presents a list of workshop recommendations.

The first of the sections comprising the body of the book (Section B) is made up of five papers. These summarise the objectives, needs and current activities relating to agro-ecological characterisation, classification and mapping. The needs of those both inside and outside the international agricultural research system are highlighted in these papers.

Section C includes two papers which discuss the nature, sources and quality of data, collected and available from different institutions, which can be used as a basis for this type of work. One can only conclude that it will still be some time before a consistent, readily accessible and comprehensive data set is available.

The major part of the book is called 'Methods in Agro-Ecological Characterization in International Agricultural Research'. This section (D) includes 14 papers which cover a very wide range of topics. For example, types of crop modelling, weather modelling and the use of remote sensing are described. The summary of session discussions highlights the diversity of topics and issues covered. As a layperson in this area, I certainly found the range and breadth of coverage in this set of papers wearing.

The section on national interests and examples is short (two papers) and one is left with the feeling that more is being undertaken.

The editor has to be admired for attempting to provide an overall review of the workshop and for organising a summary set of recommendations. While this last section does provide useful reading the real value of the book from this reviewer's perspective was the individual papers and the source materials they provide. However, for those interested in extending

the methodology or keen to standardise data collection the last few pages may provide some useful guidelines.

The book includes two substantial pocketed maps and is printed on high quality paper. The cost of the book will therefore probably deter many readers, such as this reviewer, from purchasing a personal copy. A multi-user, library copy is therefore likely to be the best option for most agricultural economists.

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*Agricultural Marketing Enterprises for the Developing World.* By JOHN C. ABBOTT. (Cambridge University Press, Cambridge, 1987.) Pp. 217, ISBN 0 521 32597 8 (hardback), 0 521 33908 1 (paperback).

This is the latest book from a world authority on agricultural marketing. John Abbott has worked for the FAO for most of his professional life and is eminently suited to take on the syncretic task he has set himself in this very useful book. The subtitle of the book reads: 'With case studies of indigenous private, transnational, co-operative and parastatal enterprise'. This is indeed a case-study book but the 26 cases are not presented in the detail that the Harvard Business School would accept as 'case studies'. Rather, they are brief synopses or sketches. As such, they make excellent light reading and are informative for the general reader and for students starting out on an agricultural marketing course.

The 26 studies are arranged in four chapters described in the subtitle. The cases are diverse in commodity, in size of operation and in geography: they range from perishable vegetables to processed export commodities, from essentials (rice) to 'luxuries' (meat and bananas), from the Caribbean (Dominica, Honduras, Jamaica and the Windward Islands) to Africa (Cameroun (2), Nigeria (2), Kenya (2), Senegal, Zimbabwe, Botswana (2), Sudan and Zaire) to the Mediterranean (Turkey, Cyprus) to Asia (India, Thailand) and the Far East (Taiwan, South Korea). Each chapter of case studies concludes with sections summarising the main lessons to be learnt and posing a substantial set of issues for discussion.

These four chapters are sandwiched between two introductory and two concluding chapters. The introduction is a little annoying in its use of the key word 'enterprise' in two quite distinct ways: in Chapter 1 the word means a legal entity (a company or an organisation); in Chapter 2, 'enterprise' is used to refer to an operation or function (as in *private* or *marketing* enterprise). Both uses are acceptable but when placed in such close proximity will not be helpful to readers for whom English is a foreign language.

It is suggested in the preface that teachers might wish to build up dossiers to supplement the selected cases; this will certainly be necessary if the text is to be used beyond an introductory level because this is a book of success stories. In each situation, whether drawn from the local private, multinational ('transnational'), the co-operative or the public sector we have stories of success. Much can be learnt from such successes but a few contrasting failures would have taught so much more. For example, the first co-operative example (in Chapter 5) is drawn from a Farmers' Association in Taiwan. The success of the Taiwanese Farmers' Associations is very widely known and many countries have tried to emulate them without

equal success. Why, for example, have they been so unsuccessful in Malaysia? Why has the success of the Kenya Tea Development Authority (pp. 146-52) not been able to be copied by the smallholder coffee industry in the same country?

Although 'success' is the name of the game, the individual cases are not whitewashed. In many of the cases, weaknesses are noted and gentle criticism is made. For example, the conservatism and rigidity of the highly successful Botswana Meat Commission (turnover in 1982 US\$110 million) meant that the government had to pressure it in directions that were to become highly beneficial to both the country and to the Commission:

'It took a lot of pressure, for instance, to persuade the B.M.C. to control its effluent properly. A tannery was established only after it seemed that another Government corporation would do it instead. It took a decade before a decision was taken to build a second abattoir [was made].'

Most of the case studies are based on conditions in the 1970s and have the early 1980s (1980 to 1983) as the date of their last statistics. It would have been most helpful if at the end of each case study involving a public company, large co-operative or parastatal organisation, an address could have been given so that requests could be made for annual reports to add to the proposed dossier.

The last two chapters make a good job of marshalling the lessons learnt from the case studies into 'Developing an effective marketing structure' and 'Managing a marketing enterprise'.

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*Postharvest Losses, Technology and Employment: The Case of Rice in Bangladesh*, Westview Special Studies in Social, Political, and Economic Development. By MARTIN GREELEY. (Westview Press, London, 1987.) Pp. 345, ISBN 0 8133 7371 9.

The concern of this book by Dr Martin Greeley, Fellow in IDS, University of Sussex is, as the author himself succinctly puts it, to test the proposition that food availability can be increased to reduce farm level losses through technological change. A case study involving Bangladesh rice farmers is used to provide empirical support and to test the validity of his hypothesis. He argues that, on the basis of survey data he has collected, food losses in traditional post-harvest systems are considerably lower than is assumed by many analysts. The latter have used this narrow focus to convince donor agencies such as FAO to mount comprehensive (and expensive) food loss prevention campaigns in many countries throughout the developing world.

Greeley argues that much of this funding has been misdirected and that technological change which reduces food losses may lead to welfare losses which outweigh any production gain. In his study, the main losers are usually female wage earners from the poorest households. Income generation and other programmes which target these groups are what is needed if the new technology is to be of net social benefit. Greeley's work is worth reading by any practitioner in this field (if only) to gain an appreciation of the amount of effort that is required by economists to challenge the accepted doctrine of non-economists. It is thoroughly well researched, painstakingly put together and extremely well presented. For example in

Chapter 2, Greeley surveys much of the published literature on the level of post-harvest losses. He demonstrates convincingly that, on this evidence, much of which is unsubstantiated, contradictory, anecdotal or misleading, the magnitude of post-harvest losses reported by technologists cannot be scientifically verified. One is then left with the impression that aid agencies have been taken for a ride by food handling technologists. This, he asserts, has led to significant bias in research and development programmes during the 1970s.

While Greeley has put a strong case for wider programmes at the farm level incorporating socially and technologically efficient food loss prevention programmes, post-harvest losses in central stores administered by parastatals are significantly higher than farm level losses. Much of this is due to the lack of incentives within the state storage network system to store grain in hygienic conditions and inability to carry out properly conducted storage quality maintenance programmes on a regular basis. During the 1970s, at the time of the food crisis, many countries directly intervened in their grain (particularly rice) marketing system to ensure effective supplies of cereal grains were available to consumers and to influence domestic market conditions. Intervention at the time was intended to stabilise prices and production and to maintain food security stocks.

Greeley is correct in his analysis that food losses at the farm level are low and, in his study, significantly lower than other reported loss studies. It is only when the grain enters the central storage system that food losses are of increasing concern.

Greeley's work has also made a significant contribution to the post-harvest policy dialogue particularly in relation to the broader distributional implications of introducing food loss reduction technologies. In particular, Greeley's analysis has important implications on women in development issues. Problems of female subordination and rural poverty, particularly among landless women displaced as a result of technology changes in Bangladesh, are addressed in terms of the organisation and more effective targeting of women's programmes.

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