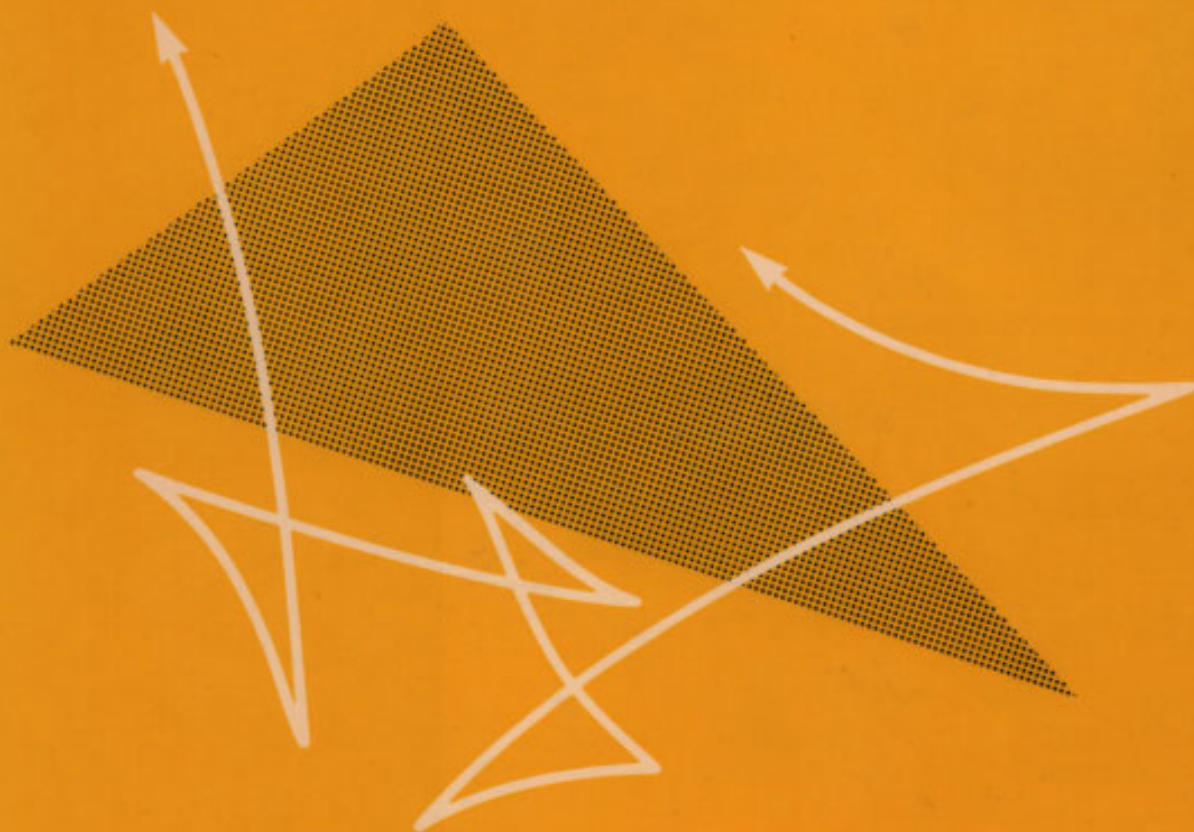


MATHEMATICAL PROGRAMMING FOR ECONOMIC ANALYSIS IN AGRICULTURE



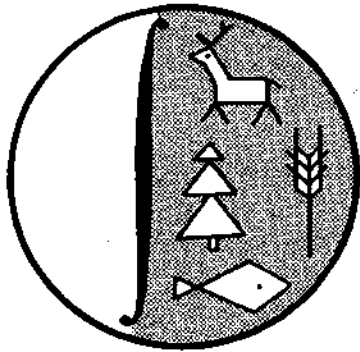
**Peter B. R. Hazell
Roger D. Norton**

In recent years, mathematical programming has become an important and widely used tool for economic analysis in agriculture. Its use has been facilitated by major advances in computing technology and in methods of incorporating observed institutional and economic reality into programming models. As Hazell and Norton show, such models can offer unique advantages over other methods of agricultural sector analysis. Mathematical programming models can address the multivariate and highly interlinked nature of the agricultural sector. Further, they can bring detailed micro-level data bases to bear in the analysis of such policy issues as pricing, employment, investment decisions, comparative advantage, and risk analysis.

This book is the first to describe fully the theory and application procedures needed for building programming models in agriculture. The authors show how many different hypotheses about economic behavior can be incorporated into programming models and how these models can be applied to many diverse questions of agricultural policy. Covering the field completely, including farm-level and sector-level analysis, this book contains chapters written for readers both interested in practical applications and those interested in theoretical underpinnings.

The book features a practical introduction to the theory and practice of mathematical programming and leads the reader through procedures for solving linear models. Model applications to policy analysis are illustrated with numerous real-world studies, with particular emphasis on policy analysis in developing countries.

**MATHEMATICAL
PROGRAMMING FOR
ECONOMIC ANALYSIS
IN AGRICULTURE**



BIOLOGICAL RESOURCE MANAGEMENT

A Series of Primers on the Conservation and Exploitation of Natural and Cultivated Ecosystems

Wayne M. Getz, Series Editor
University of California, Berkeley

Adaptive Management of Renewable Resources, by Carl Walters

Building Models for Wildlife Management, by Anthony Starfield and
A. L. Bleloch

Mathematical Programming for Economic Analysis in Agriculture, by Peter B. R.
Hazell and Roger D. Norton

Range Economics, by John P. Workman

MATHEMATICAL PROGRAMMING FOR ECONOMIC ANALYSIS IN AGRICULTURE

PETER B. R. HAZELL

International Food Policy Research Institute

ROGER D. NORTON

University of New Mexico
Oklahoma State University

MACMILLAN PUBLISHING COMPANY
NEW YORK

Collier Macmillan Publishers
LONDON

Copyright © 1986 by Macmillan Publishing Company
A Division of Macmillan, Inc.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the Publisher.

Macmillan Publishing Company
866 Third Avenue, New York, NY 10022

Collier Macmillan Canada, Inc.

Printed in the United States of America

printing number	year
1 2 3 4 5 6 7 8 9 10	6 8 7 8 9 0 1 2 3 4 5

Library of Congress Cataloging-in-Publication Data

Hazell, P. B. R.

Mathematical programming for economic analysis in agriculture.

Bibliography: p.

Includes index.

1. Agriculture—Econometric models—Linear programming. 2. Agriculture—Developing countries—Econometric models—Linear programming. I. Norton, Roger D., 1942—

II. Title.

HD1433.H39 1986

338.1'0724

85-23085

ISBN 0-02-947930-4