

10197

Agricultural
Extension
by
Training and Visit
The Asian Experience

edited by
Michael M. Cernea
John K. Coulter
John F. A. Russell

FILE COPY

A World Bank
and UNDP Symposium

12/83

Agricultural Extension by Training and Visit

The Asian Experience

A World Bank and UNDP Symposium

I would suggest to your Grace, that a number of persons should be selected, possessing sound practical knowledge of the most improved systems of agriculture applicable . . . and of such general education as may enable them to communicate that information orally in a satisfactory manner, and that those persons should be employed to perform each a circuit through certain districts . . . such as your Grace may decide upon, and to deliver lectures on practical agriculture to the farming population.

Your Grace will, probably, agree with me that it would be highly important that those lectures should not be conceived or delivered in an abstract or purely scientific style . . . ; they should be couched in clear but simple language, and might, in some cases, be usefully illustrated by practical demonstrations.

In the delivery of three such lectures, your Grace will, probably, find that a week may be usefully occupied; and, as each lecturer can embrace in his circuit about eight localities, his journey may be considered as likely to occupy eight weeks . . .

— From a letter by the Earl of Clarendon,
Lord Lieutenant of Ireland, to the President
of the Royal Agricultural Improvement Society
of Ireland, September 23, 1847

Agricultural Extension by Training and Visit

The Asian Experience

Edited by

Michael M. Cernea
John K. Coulter
John F. A. Russell

THE WORLD BANK
Washington, D.C., U.S.A.

Copyright © 1983 by the International Bank
for Reconstruction and Development / THE WORLD BANK
1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

First printing December 1983
Second printing November 1984
All rights reserved
Manufactured in the United States of America

The views and interpretations in this book are those of the contributors
and should not be attributed to the World Bank, to its affiliated
organizations, or to any individual acting on their behalf.

<i>Editor</i>	James E. McEuen
<i>Figures</i>	Pensri Kimpitak
<i>Book design</i>	Brian J. Svikhart
<i>Cover design</i>	George P. Parakamannil

Library of Congress Cataloging in Publication Data

Main entry under title:

Agricultural extension by training and visit.

(A World Bank symposium)

Papers presented at the Asian Regional Workshop in
the T & V System of Extension, sponsored by the World
Bank and the United Nations Development Programme, at
Chiang Mai, Thailand, in 1982.

Includes bibliographical references.

I. Agricultural extension work—Asia—Congresses.

I. Cernea, Michael M. II. Coulter, John K., 1925–
III. Russell, John F. A., 1938– . IV. Asian Regional
Workshop in the T & V System of Extension (1982: Chiang
Mai, Thailand) V. World Bank. VI. United Nations
Development Programme. VII. Series.

S544.5.A74A47 1983 630'.7'1505 83-26010
ISBN 0-8213-0301-5

Foreword

The World Bank is strongly committed to promoting agricultural development in its borrowing member countries. In most of these countries, agriculture makes up a high proportion of the economy and is the economic base for an even higher proportion of the people in poverty. The Bank has lent for agriculture and rural development since its inception, and over the past decade it has devoted about a third of its annual lending to this sector. The bulk of this lending is based on the premise that the most effective way to promote agricultural and rural development is to provide the least advantaged farmers with means to increase their productivity. This is a difficult task for several reasons, some of which are beyond the Bank's control, but it can be and is being accomplished through a range of joint efforts actively supported by governments and the Bank.

If they are to increase their productivity, small farmers need to use scientifically based technologies that are suitable for their location and the farming system they are following. Once developed, such technologies must be transferred to farmers in ways that the farmers can understand and in forms that they feel able to adopt. In other words, agricultural research must be closely geared to the perceived needs of farmers, and its findings must be formulated so that they can be transmitted to farmers readily and clearly. Conversely, farmers must also be able to transmit their perceived problems clearly and quickly back to researchers for evaluation and solution.

This process has proved much simpler to articulate than to effect. One of the most promising means of achieving it is the Training and Visit (T & V) system of agricultural extension. Following on the success of its first involvement with T & V extension in the early 1970s, the World Bank is now financing over ninety projects that explicitly depend on the application of the T & V system. This represents a substantial investment by the Bank and an even more substantial one by its borrowers. Most of these projects are in Asia, although countries elsewhere are increasingly turning to the principles of the T & V system as a means of strengthening their extension services and thus improving small farmers' productivity.

To capture and disseminate the nearly ten years of Asian experience with T & V extension system, the World Bank and the United Nations Development Programme (UNDP) arranged and helped to fund an Asian Regional Workshop on the T & V System of Extension held at Chiang Mai, Thailand, in late 1982. Managers of T & V systems from six Asian and two African countries presented papers and exchanged experiences, together with staff from the Food and Agriculture Organization of the United Nations, the UNDP, and the World Bank concerned with agricultural extension and research projects.

This volume contains the keynote papers presented by extension system managers and evaluators from Asian countries, together with issue papers by the workshop discussants and introductory and concluding overview chapters. Whether they are policymakers, project designers, rural sociologists, extension workers, or agricultural researchers, it is hoped that those who read this volume will find the experience it documents of value for their own work in extension and development.

S. Shahid Husain
Vice President
Operations Policy
The World Bank

December 1983

Contents

Foreword by <u>S. Shahid Husain</u>	v
Definitions	xi
Acknowledgments	xv
Overview	
1. Agricultural Extension: A Tool for Rural Development	3
<u>Donald C. Pickering</u>	
The Importance and Shortcomings of Traditional Extension Systems	4
The Training and Visit System of Extension	6
Advantages and Difficulties in Establishing the T & V System	9
The Chiang Mai Workshop	12
References	13
Farmer Participation and the Village Extension Worker	
2. Farmer Participation in the Training and Visit System and the Role of the Village Extension Worker: Experience in Indonesia	17
<u>Dady Ganda Sukaryo</u>	
Formation of Farmer Groups: Sociocultural and Administrative Considerations	18
Selection and Role of Contact Farmers	20
Conduct of Field Extension Worker Visits and Method of Encouraging Feedback from Farmers	21
Role of the Field Extension Worker	24
3. Farmer Participation and the Village Extension Worker: A Comment	26
<u>John F. A. Russell</u>	
Group Selection and Development	26
Role of the Contact Farmer	28
Encouraging Better Participation and Feedback	29
Role of the Village Extension Worker	29
Incentives for Village Extension Workers and Farmers	30
Conclusions	31
References	31
Technical Recommendations and Research-Extension Linkage	
4. Developing Technical Recommendations and Research-Extension Linkages: Experience in India	35
<u>N. N. Mehta</u>	
Agricultural Extension in India	35
The Training and Visit System in Madhya Pradesh	36
Evaluation of Constraints to Production	37
Effectiveness of the T & V System	40
Fixing Priorities for the Extension System	41
State Planning Committee	43
Regional Coordination Committee	43
Zonal workshops	43

Monthly workshops	44
Fortnightly training	44
Adaptive Research and Formulation of Recommendations	44
Adjustment of Recommendations	45
Organizing Linkages for Effective Contact between Farmers, Extension, and Research	46
5. The Interdependence of Research and Extension: A Comment	49
<u>John K. Coulter</u>	
Improved Technology as a Component of an Extension System	49
Identifying important problems	49
Formulating researchable problems	50
Developing successful solutions	51
Research-Extension Linkages	52
Conclusions	52
Training	
6. Training in the Training and Visit System: Experience in Sri Lanka	55
<u>S. Natesan</u>	
Development in Training	55
Creating awareness and understanding of the system	56
Training of field workers	57
Training of Subject Matter Officers	60
Training of information and communication staff and establishing linkage with broadcasting personnel	60
Training those responsible for T & V administration and services supporting extension	61
Issues in Training	61
Conclusions	63
7. Training Extension Staff: A Comment	64
<u>G. R. Galgali and John H. Lindt</u>	
Training for Extension Agents	64
Training Methods	65
Practical Training and Tests	66
Present Experience and Problems	67
Management and System Maintenance	
8. Management and System Maintenance in Extension Services: Experience in Thailand	71
<u>Vorasak Pakdee</u>	
Evolution of Agricultural Extension in Thailand, 1968-82	71
First period (1968-72)	73
Second period (1972-76)	73
Third period (1977-82)	75
Emerging problems	75
Problems of Implementing the Training and Visit System in Thailand	75
Necessary adaptations	77
The projects and their implementation	77
Operational problems	78
Functional problems	79

CONTENTS	ix
Solutions to Problems	81
Present Situation	83
New Challenges for the Agricultural Extension Service	84
Conclusions	85
Reference	86
9. A Modified Training and Visit Extension System: Experience in the Philippines	87
<u>Francisco G. Rentutar and Romeo V. Aquino</u>	
Objectives and Problems	87
Strong Central Direction	88
Extension at the Field Level	90
Links with Research	92
Training	93
Monitoring and Evaluation	94
Conclusions	94
10. Organizing Extension along Training and Visit Lines: Experience in Nepal	96
<u>R. C. Mishra</u>	
The Agricultural Extension and Research Project	96
Current Status of the Project	97
Farmers' Reaction to and Participation in the T & V System	98
Technical Recommendations and Linkage with Research	99
Planning and Implementation of the Training Program	100
Implementation and System Maintenance	101
Monitoring and Evaluation	101
Conclusions	102
11. Management's Role in Training and Visit Extension: A Comment	103
<u>Michael Baxter</u>	
The Initial Role of Management	103
Critical Areas of Intervention	104
Incentives to improve performance	104
Field supervision	105
Diversification	105
Other Implications	106
Farmer participation	106
The Department of Agriculture	107
Other government departments	107
Farmer-extension-research relations	107
Flexibility and Innovation	108
Conclusions	109
 Monitoring and Evaluation	
12. Monitoring and Evaluation of Extension: Experience in Thailand	113
<u>Adisak Sreensunpagit</u>	
Background	113
The Monitoring and Evaluation Unit	115
Organizational structure	115
Staffing of the MEU	117
Relations with management	117
The Monitoring	119
Objectives and responsibilities of monitoring	119

Design and methodology	119
Planning and processing the surveys	121
Findings and feedback to management	121
Problems in monitoring	121
Impact Evaluation	123
Objectives of evaluation	123
Planning, methodology, and findings	123
Problems in evaluation	125
Case Studies	125
Objectives of sociological analysis	125
Planning, methodology, and findings	125
Cost of the Monitoring and Evaluation Effort	127
Effectiveness and Conclusions	128
13. Evaluation of Farmers' Reactions to Extension Advice: A Comment	132
<u>Michael M. Cernea</u>	
The Present State of Monitoring and Evaluation	133
Research Strategies for Monitoring and Evaluation	135
Sociological Monitoring of Communication Networks	137
An Appropriate Mix of Data-generation Instruments	138
Managers and Evaluation	139
References	140
Issues and Prospects	
14. Strengthening Extension for Development:	143
Current Issues and Prospects	
<u>Michael M. Cernea, John K. Coulter,</u>	
<u>and John F. A. Russell</u>	
Overview	143
Technology Generation	145
Sociological Aspects of the Knowledge-transfer Process	147
Evolution of the Training and Visit System	152
References	154
Participants in the Chiang Mai Workshop	155

Definitions

GENERAL TERMS

AEO	Agricultural Extension Officer (for relations of T & V extension personnel to each other, see chapter 1, figure 1-1)
Contact farmer	Farmer selected at the village level to interact with the T & V system network—to receive technical recommendations and to feed back results and revised recommendations
DEO	District Extension Officer
Entry point	Point in local farming system at which technical recommendation will likely have greatest effect
Impact point	Technical recommendation to improve agricultural practice
SDEO	Subdivisional Extension Officer
SMS	Subject Matter Specialist
T & V	Training and Visit
VEW	Village Extension Worker
ZEO	Zonal Extension Officer

COUNTRY-SPECIFIC TERMS

India (chapter 4)

<u>kharif</u>	India's autumn crop, sown in June before the monsoon and harvested beginning in August
<u>toria</u>	Rape (<i>Brassica napus</i>), a winter oilseed crop
NCAER	National Council of Applied Economic Research
NCA	National Commission on Agriculture

Indonesia (chapter 2)

FEA	Field extension area; see VUA
FEW	Field Extension Worker, or VEW in Indonesia; see PPL
<u>gotong royong</u>	Farmers' mutual self-help association, a traditional village group
INSUS	Special Intensification Program
<u>Kabupaten</u>	District; the subdistrict is <u>Kecamatan</u>
<u>mapalus</u>	Farmers' mutual assistance association, a traditional village group (primarily in Celebes)
<u>madya</u> group	Highest of the Indonesian government's classifications (elementary, advanced, and <u>madya</u>) based on degree of dynamism and development of informal farmer groups; see <u>utama</u>
NFCEP	National Food Crops Extension Project
PB	<u>Petani Biasa</u> , follower farmers
PPL	<u>Penyluhan Pertanian Lapangan</u> , FEW; equivalent of VEW in Indonesia
PM	<u>Petani Maju</u> , progressive farmers
PPM	<u>Penyluhan Pertanian Madia</u> , Field Extension Supervisor; a mid-level extension officer, or AEO, in Indonesia
REC	Rural Extension Center

<u>subak</u>	Farmers' association for use of irrigation water and maintenance of the irrigation system within a watershed, a traditional village group (primarily in Bali)
<u>utama</u>	Formal farmers' cooperative officially registered with the government; organizational status beyond the <u>madya</u> group
VUA	Village unit area, an area of approximately 800-1,000 rice fields covered by a FEW; term proposed to supersede FEA

Nepal (chapter 10)

AADO	Assistant Agricultural Development Officer
ADO	Agricultural Development Officer
Gazetted Class	Classification of senior government officials whose names are published in the <u>Government Gazette</u>
JT	Junior Technician
JTA	Junior Technical Assistant, or AEO in Nepal
NRs	Nepali rupees
<u>panchayat</u>	Village administrative and development unit comprising 500-1,000 villagers divided into nine wards
PLAA	Panchayat-level Agricultural Assistant, or VEW in Nepal
<u>tarai</u>	Southern lowland territory of Nepal adjoining the Gangetic plain

Philippines (chapter 9)

<u>anakbukid</u>	Village or farm youth
<u>barangay</u>	Community or village
NEP	National Extension Project
₱	Philippine peso(s)

Sri Lanka (chapter 6)

AD	Assistant Director
AI	Agricultural Instructor
AO	Agricultural Officer, or AEO in Sri Lanka
DTC	District Training Center
<u>Grama Sevaka</u>	Village-level administrative officer
RRC	Regional Research Center
RTC	Regional Training Center
RTWG	Regional Technical Working Group
SMO	Subject Matter Officer, a subject specialist at the district level; in Sri Lanka, the SMS operates at the regional level
Stress point	Impact point
VLW	Village-level Worker, or VEW in Sri Lanka

Thailand (chapters 8 and 12)

<u>amphoe</u>	District administrative unit comprising ten <u>tambon</u> (about 10,000 farm families); see <u>tambon</u>
B	Baht, the Thai currency unit
chak	Irrigation canal

DAE	Department of Agricultural Extension
KA	<u>Kaset Amphoe</u> , agricultural extension agent attached to the <u>amphoe</u> ; immediate supervisor of the district's KTs, or AEO in Thailand
KT	<u>Kaset Tambon</u> , agricultural extension agent attached to the <u>tambon</u> , or VEW in Thailand
MEU	Monitoring and Evaluation Unit of the DAE
MOAC	Ministry of Agriculture and Cooperatives, the parent ministry of the DAE
<u>muban</u>	A group of villages, usually comprising 100 farm families
NAEP	National Agricultural Extension Project, implemented in phases I and II
NSO	National Statistics Office
PC	Position classification, designation for levels of civil service employment
PEO	Provincial Extension Officer
<u>tambon</u>	Administrative subunit within the <u>amphoe</u> , comprising about ten <u>muban</u> (about 1,000 farm families)

Acknowledgments

The Training and Visit (T & V) system of extension requires a working network of active participants and a free flow of communication for its success. So did the preparation of the present volume, which incorporates an integrated selection of papers, most of which were initially written for the Asian Regional Workshop on the Training and Visit System of Extension held in Chiang Mai, Thailand, in November-December 1982.

We are indebted, first, to His Majesty's Government of Thailand and to Thailand's Ministry of Agriculture and Cooperatives for agreeing to host the Chiang Mai Workshop and for organizing the field visits. We are especially grateful to His Excellency Narong Wongwan, Deputy Minister for Agriculture and Cooperatives, who opened the workshop. Our thanks also go to the United Nations Development Programme, which cosponsored the workshop, and especially to William Mashler, Senior Director of the Division of Global and Interregional Projects, for his personal support and active participation throughout the conference. Thanks must also be given to Leif Christoffersen, who organized the conference in his capacity at that time as Assistant Director of the World Bank's Agriculture and Rural Development Department. He was ably assisted by Mordecai Blustein and by a steering committee comprising Bank staff and Yosef Elkhana, a technical consultant. We thank them and the administrative organizer, Janice Granados, for their tireless efforts in ensuring the success of the conference and its smooth operation. Invaluable logistical support in planning and running the workshop was also provided by staff of Thailand's Ministry of Agriculture and Cooperatives, especially by Vorasak Pakdee, then Director of the National Agricultural Extension Project, by Chulhathep Pongsoyech, as well as by the World Bank's Resident Mission in Bangkok, through its Director, Adi Davar, and Kenneth Sigrist.

Many other World Bank staff, too numerous to name, contributed ideas and comments throughout preparation of the workshop and the manuscripts that emerged from it. For these unsung contributions we are grateful. It almost goes without saying that we are deeply indebted to Daniel Benor, whose wisdom and energy gave rise to the T & V methodology and who participated in the discussions at Chiang Mai. But because the T & V system is and must always be preeminently a grass-roots operation, we think that the most important contribution is that of the many country representatives who shared with us their valuable experiences of the T & V system as it is practiced, and we express our thanks to them. Because of constraints on length, we could not include in this volume all of the thoughtful papers submitted by workshop participants, whose names are listed at the back of the volume.

When the workshop was over, the task remained of revising, structuring, and integrating the conference papers for wider dissemination. Without the cooperation of the keynote speakers and discussants after the workshop, this volume would not have been possible. We are grateful to Joslin Landell-Mills, on the staff of the journal Finance & Development, for her help in reworking conference notes and project reports into drafts for two of the chapters. We acknowledge the tireless support of Consuelo Carson, Mella Medley, Mae Gahl, Enid Wilson, and Martha Parry, who typed drafts of the manuscript and the revisions to them.

Finally, the epigraph to the volume deserves brief comment. Lord Clarendon's letter led to the establishment of what was, during the great potato famine in Ireland, possibly the first modern agricultural advisory and instructional service, which operated from 1847 to 1851. The letter was recently brought to public attention by Gwyn E. Jones, senior lecturer in rural sociology at the Agricultural Extension Centre of the University of Reading,

England (Gwyn E. Jones, "The Clarendon Letter," in G. E. Jones and M. J. Rolls, eds., Progress in Rural Extension and Communication Development, vol. 1, pp. 11-19; Chichester, U.K.: John Wiley & Sons, Ltd., 1982). The extract is reprinted here by kind permission of the publisher.

Michael M. Cernea
John K. Coulter
John F. A. Russell

Overview

1

Agricultural Extension: A Tool for Rural Development

Donald C. Pickering

Agricultural extension alone is not the key that directly unlocks the door to national prosperity. It can only be effective in its proper sphere of influence—the agricultural sector—if it is fueled by a steady supply of relevant technology and is used in conjunction with other factors of production including proper pricing policies, required inputs, and agricultural credit. But if its role is complementary, it is nonetheless crucial.

Effective extension provides the vehicle for increasing agricultural productivity because it links the farmer with the outside world—the scientist, the creditor, and the consumers of his product. Where central government programs and outside assistance attempt to introduce changes in traditional technologies, extension offers the possibility of adapting the technology to the rural producers' needs so that its benefits can be recognized and the change adopted. This volume addresses the experience with one form of agricultural extension—the Training and Visit (T & V) system—which concentrates primarily on this area: rendering change sustainable because it grows out of perceived needs.

Agriculture has always played a key role in changing societies. In Europe, the United States, and Japan, transformations in agricultural production stimulated the transformation of societies into the industrial structures we know today and heralded unprecedented economic growth. The evidence from the developing world over the past decade or so is consistent with this experience. Despite the diversity of natural resources, population growth rates, farming systems, and policies affecting agriculture, those developing countries with dynamic agricultural systems have almost universally done better in terms of overall economic growth (including industrial growth) than those where agriculture has stagnated.

Yet—although agricultural growth rates since the 1950s have increased on average at nearly twice the rate of earlier periods, partly as a result of the contribution of technical innovations—population growth has sharply reduced the per capita benefits from agricultural growth. Moreover, agricultural growth has been slowest in the poorest countries, where the vast majority of the population work on the land. Experience has shown that the most effective way of both alleviating poverty and promoting overall economic growth is to raise the productivity of small farmers. But how can one translate the principles underlying successful experiences with agriculture to those that are not so successful? And what are these principles?

Identifying the precise mechanism that makes agriculture dynamic is not easy. It is tempting to ascribe such dynamism largely to the contribution of science—citing, for example, the remarkable effects that the development of new grain varieties has had on the production of wheat, sorghum, maize, and rice in some parts of the world. But even the experience with the Green Revolution has shown that unless the technology is adapted to local conditions, and unless it is accompanied by supportive government action particularly regarding its transmission to the farming population, its success will be neither

sustained nor capable of replication. The World Bank's¹ World Development Report of 1982 concluded that experience in countries with successful agricultural sectors showed that each developed from a unique combination of private initiative bolstered by public support—a combination that is unique to each country and, indeed, to particular areas of the same country (World Bank 1982).

Successful agricultural sectors are therefore also characterized by an extensive knowledge and understanding of the local environment, both physical and sociological, as well as by the existence of relevant technology and a suitable array of supporting infrastructure, services, and policies. Linking technology with the practitioner is a complex art, involving communication and interaction between many entities as well as significant cultural and behavioral factors. Crops must be adapted to local soil and weather conditions and must be suited to individual farmers' needs and capabilities. Small farmers in particular will plant new crops only if such crops do not compete with their subsistence product, if they are convinced the new crops can in fact be grown, and if the new production can be sold at a profit. Unless these conditions can be met and unless farmers can be convinced that they will in fact be met, agricultural development will not proceed (see Crouch and Chamala 1981).

Crucial elements in increasing the productivity of both large and small farmers are, therefore: first, an understanding of the intricate question of how to develop technologies suited to the physical and sociological characteristics of the local environment; second, an ability to translate this understanding into acceptable and workable recommendations for both large and small farmers. There is a third element in this process that is important for a development institution such as the World Bank: to develop recommendations to increase agricultural productivity that can be used in different socioecological environments.

THE IMPORTANCE AND SHORTCOMINGS OF TRADITIONAL EXTENSION SYSTEMS

Agricultural development practitioners have been concerned with these issues for many years. With burgeoning populations and the current worldwide economic recession, enhanced attention to such concerns has never been more appropriate or timely. The condition of agriculture the world over testifies to the gap that exists between our accumulated understanding of biological processes on the one hand and the practices of the majority of farmers on the other. Existing knowledge—embodied in research results and books, technologies and tools—has for years been capable of evening out some of the glaring differences in agricultural productivity between the developing and the developed world. Yet the differences persist. Agricultural extension is one of the ways of closing the gap. Under all kinds of agricultural systems and in a wide range of political and economic environments, research workers are developing technologies for small-scale agricultural producers, and extension officers are attempting to persuade farmers to adopt them. Unfortunately, however, in many instances these efforts are inadequate in amount, unfocused in direction, and consequently ineffective.

The World Bank's experience with the role of extension in improving the productivity of farmers in underdeveloped areas shows very clearly the key function of three ingredients of success: inputs such as seeds and fertilizer suited to local conditions and practices; a production technology acceptable to the bulk of the farming population; and, once the

1. The term World Bank encompasses the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA).

farmer has progressed beyond the subsistence stage, a market and related infrastructure for his products. There are other components of success, but these are supportive. Credit, for instance, may well assist by making inputs more readily obtainable for the farmer; government price and subsidy policies can likewise create vital incentives or disincentives.

Experience at the field level has also shown that the technologies must be formulated in ways that can be readily and clearly transmitted to the farming population—that the technologies must be relevant and, perhaps more important, must be perceived to be relevant by the farmers. The requirement that the recommendations be appropriate means that both the technical and socioeconomic problems of the farmers have to be transmitted to the researchers for study and solution. That they are perceived to be relevant means that technologies affordable to the farmer should be communicated in ways farmers can understand and in forms they perceive as usable. This entails a two-way process that is much simpler to formulate in words than to put into effect.

Many traditional agricultural extension systems are beset by serious weaknesses. Research, essential to the development of locally suitable inputs and technologies, is almost nonexistent in some countries. In one West African country, for instance, the only relevant agricultural research being done until recently was on rice, which is only one of several staples grown. In far too many other countries, research workers decide for themselves what topics are deserving of their attention without regard to the problems facing their cousins farming the land. Research services tend to reward their staff on the basis of number of publications; as a consequence, research topics tend to be those most capable of rapid solution and only coincidentally of relevance to promoting increased agricultural productivity. Thus, in many countries the quality of research is inadequate. The research itself is restricted to the confines of the research station, and the results are ill-adapted to different ecological zones or types of farmer.

Sometimes causing and sometimes compounding the isolation of research, agricultural extension in developing countries has tended to emphasize a one-way passage of information from researcher to the farmer rather than a two-way flow of information that includes the farmer's passing information on his problems back to the researcher. In consequence, many of the more responsible research activities go no further than seeking how to obtain optimal yields from a given crop or enterprise undertaken in the artificial condition of the research station, and never actually address the technical and other reasons that farmers are not able to improve their yields to levels approaching those achieved by researchers. This one-way flow of information has meant that in many areas it is only the richer farmers who benefit from such technology and expertise that does exist, since recommendations based on optimal returns to particular crops are often too difficult or risky for a small farmer to apply.

As might be expected, in areas emerging from a largely subsistence agriculture, the extension services themselves are generally poorly organized and frequently are subject to political and administrative abuse. The sociology of these changing farming communities—their social potential and constraints—is little known. In the absence of an organized program, there is no regular service to farmers, no systematic advice is given, and, for reasons cited earlier, what there is may well be not relevant. The extension agent rarely has broad farming experience. Many extension agents tend to be much younger than their audience—in general a grave potential disadvantage in rural societies. Moreover, since the extension worker is frequently not backed by an efficiently organized research service, his advice is generally not highly regarded by farmers, and he has no other means of convincing the farmer that his extension messages have something to offer.

The shortcomings of many traditional agricultural extension systems are summarized in the following description, paraphrased from documents of one World Bank extension project in a West African country, which speaks to generic weaknesses:

The work program is usually of an ad hoc nature. Little guidance is available on its content, presentation, or means of execution. There is no monitoring of program effectiveness. The extension agent is a "general agricultural agent" whose tasks range from promoting new technology, organizing credit schemes, supplying inputs, to performing general administrative duties. This wide-ranging responsibility normally results in little organized work being done. Because working conditions, general support facilities, and supervision of extension agents are poor, salaries are low, and education requirements for recruitment are minimal, general extension results are negligible and morale is low. The contact between extension and research is minimal, and the results of any research trials or demonstrations have limited relevance to the particular problems of local farmers.

The fundamental problems are that there is no single line of technical direction and in-service training, no structured timetable of agricultural messages to be presented, no system of regular visits to specific farmers in the community, and no efficient system of feedback of results and farmers' needs and problems... The task of "improving the farming community," ill-defined in direction and content, is overwhelming for the extension agent, who increasingly falls back on his administrative duties as an excuse for not visiting the field. A vicious circle has thus developed—the lack of response by farmers is blamed on the extension service by research staff and senior government officials, who withdraw support for extension, and extension then achieves even less.

Similar problems existed in India in the 1970s. Here, skepticism about the role of extension coexisted with an emphasis on input supplies and an almost complete absence of systematic contact between the agricultural department staff and the average farmer. As a result, recommendations being worked on by researchers frequently did not fit farmers' needs. Since most crop recommendations were developed under irrigation, regardless of the expense of physical or labor inputs, they were also inappropriate to the financial and physical conditions under which the majority of the farmers operated. Thus, because of the lack of central coordination of extension services, the field agent generally distributed his time between proliferating duties, answering to several authorities and to none of them effectively. Most field agents also had to contend with excessively large jurisdictions—one agent for 2,000 or more farm families was a common ratio.

THE TRAINING AND VISIT SYSTEM OF EXTENSION

Although no country can achieve high levels of agricultural production without effective research and extension, the need for extension has still not been clearly perceived by the policymakers in many countries. This is partly because the technological role of extension has been subordinated, as it was in India in the 1960s and early 1970s, to office reporting and to the supply of inputs and partly because in many countries no workable organizational structure has emerged.

In this context, the T & V system is one of the more interesting innovations to have occurred recently in the field of agricultural extension. While it has entailed problems of its own, it aims to remedy the weaknesses of traditional extension work by rendering research relevant to the small farmer and by formulating the results so that they are perceived to be relevant and can be readily put into practice.

Initially developed by Daniel Benor (Benor and Harrison 1977), the T & V system was first introduced extensively by the governments of several states in India, with World Bank assistance, during the second half of the 1970s, after a field trial in a project in Turkey. Because of its success, particularly with crops under irrigation, it has also been adopted in Bangladesh, Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and, recently, in several countries in West and East Africa. In August 1982 there were sixty-five Bank-financed projects (ongoing or under preparation) explicitly using the T & V system, about twenty that incorporated elements of it, and ten projects not financed by the Bank that were using it.

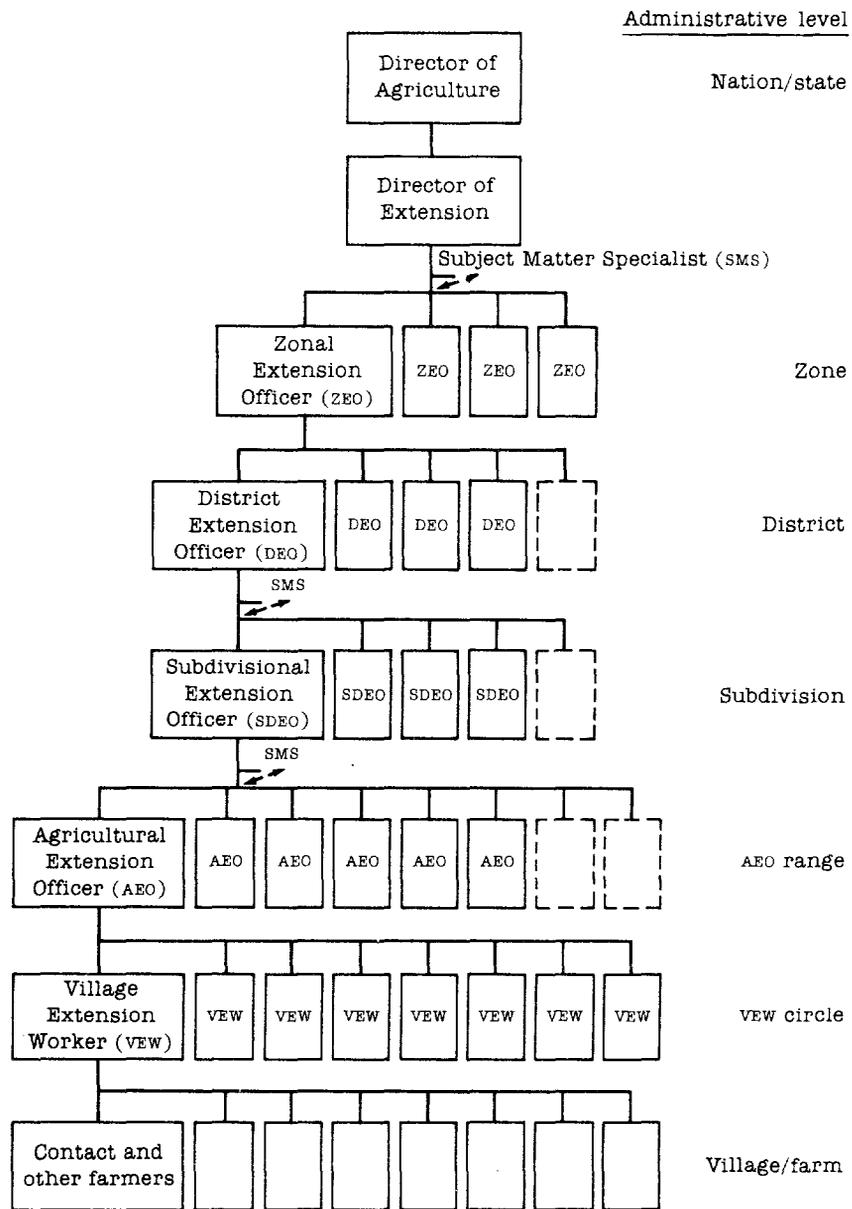
The essence of the system is that it is—inherently—sufficiently flexible to be used effectively in any type of farming and under any conditions. Its aim is to improve the use of existing resources by concentrating initially on key improvements in major crops that can produce significantly better yields fairly quickly and cheaply. In some areas, where farming practices are already efficient and appropriate, this has meant giving farmers technical advice on more productive crops or more appropriate inputs. In others, it has meant advice on better farming methods—when to sow or how to weed. It has been shown that quick and successful results are an important way of demonstrating the use of the system and of persuading more farmers to adopt it.

The T & V system is centered on providing farmers with relevant, clear, and sensible advice, which depends on a close two-way exchange of communication contacts between farm families, extension workers, researchers, and administrators. The system functions by allocating precise responsibilities, by carefully timing activities, and by concentrating on a few actions at a time. Figure 1-1 shows a standard line of command: not shown are all the links with research and the timetable of extension and extension research activities, which are equally important. Village Extension Workers (VEWs) visit small groups of “contact” and other farmers at least once a fortnight to teach them three or four carefully chosen recommendations, or “impact points,” about what to do over the next two weeks. Since farmers attending the sessions should also pass the advice on to other farm families, one extension worker can reach from 500 to 1,200 farm families in this way. The extension workers—who typically spend eight days out of every two weeks on these visits—spend one day at a training session where Subject Matter Specialists (SMSs) teach them the recommendations for the next two weeks and discuss farmers’ problems from the previous fortnight. When appropriate, these sessions are attended by representatives from supply and credit agencies who collect information on the inputs and support the farmers will be needing.

The SMSs divide their time, according to an equally structured program, between these training sessions, research, and field work; an important element of the last activity involves adaptive trials on farmers’ fields to improve recommendations. The supervisors of extension field workers also attend training sessions, in addition to spending at least eight days every two weeks in the field in supervising the extension workers. At every level, contact is maintained between field work and research, concentrating the system on making the extension work deal effectively with farmers’ problems.

The T & V system embodies few new ideas, but by emphasizing key principles frequently neglected by existing extension systems—an emphasis which is therefore highly visible—it can have a significant impact. In India, for example, under the Community Development Program established in 1952, the village-level worker was the point of contact between the government and the farmer. Although he was meant to spend 80 percent of his time on agricultural work, the extension worker had to provide virtually all the public services needed by the village and had too much else to do to provide effective agricultural extension services. The situation became acute once Indian farmers began to use new

Figure 1-1. Organizational Pattern of the Training and Visit (T & V) System of Agricultural Extension



Source: Benor and Baxter, forthcoming.

high-yielding cereal varieties, and the extension worker became involved in providing supplies of inputs. The T & V system represented a radical departure from this multipurpose approach, and agricultural efficiency—in terms of management practices and cropping sequences—has improved dramatically because of it. Since trials in a few pilot areas in the mid-1970s, thirteen states² in India have adopted the T & V system in projects financed by the World Bank—projects that should eventually, at full development, reach 69 percent of India's cropped area.

ADVANTAGES AND DIFFICULTIES IN ESTABLISHING THE T & V SYSTEM

Adopting the T & V system involves reforming existing extension services—a major organizational effort. The magnitude and complexity of this reorganization can be observed by reviewing some of the agricultural extension and research development projects which are being implemented, with financial and technical assistance from the World Bank through IBRD loans or IDA credits, in different countries and states. In India, for instance, the total cost of the agricultural extension and research project in Rajasthan is about US\$29 million, of which the Bank provided an IDA credit of US\$13 million; in the Punjab of Pakistan, the corresponding figures are US\$23 million and US\$12.5 million; in Sri Lanka, US\$28 million and US\$15.5 million; and so on. Typically, project funds are used to restructure and redeploy the village-level staff of the extension services; to strengthen considerably the SMS cadre; to equip the service with better means of transport, enabling it to reach farmers regularly; to strengthen the staff of existing agricultural research units, to create new research centers for ecological areas not covered by the existing network, or both; to finance more regular training of extension agents and researchers; and to finance new agricultural research projects concentrating primarily on the food crops grown by the small farmers.

Such programs have the advantage of injecting new resources into the critical links of the extension-research complex, of making more efficient use of the resources already in place, and of orchestrating the synergism between these various activities undertaken simultaneously rather than separately. The organizational redeployment of the human resources of the system is thus strongly backed up, and the services provided to farmers become regular and systematic, substantially improved in quality.

Although complete reform takes time and there is still scope for improvement, the implementation of the visit schedule of the VEW and the regular training program has an immediate effect on the VEW's technical competence and the relevance of his advice. The key changes have been to make the extension staff responsible only for extension work in a unified service and to put pressure on agricultural research centers to concentrate on the practical problems of the average farmer. As a result, technical recommendations are now available that can substantially increase farmers' incomes. The success of these recommendations for farming under irrigation conditions is well known and proven. Increasing numbers of recommendations are also available to improve the productivity of small farmers in rainfed areas with minimal investment on their part, and many are relevant for raising the productivity of large farmers as well.

The results of the T & V system are hard to quantify. It is not easy to measure farmers' perceptions that extension advice has improved their lot, nor the increased relevance of the advice itself—though both are readily apparent on field visits. Some ways of measuring the success of extension advice could contradict the actual results: a major achievement of

2. Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, and West Bengal.

the system might be to improve the efficiency in the use of inputs, which could appear as a reduction in their supply. But some indirect effects of the T & V system on production are evident. In the State of Orissa in India, for example, T & V extension has been the main vehicle for promoting the planting of oilseeds and pulses; the area planted under both increased from 1.5 million hectares in 1977 to 2.3 million hectares in 1980. In Rajasthan during the first three years under the system, wheat, cotton, and groundnut yields went up; the area planted under hybrid millet increased more than threefold in some areas and was replaced by soybeans in others; and the seed treatment and fertilizer applications recommended by the VEWs have been adopted by almost 50 percent of the farming population.

But instituting a T & V system cannot be accomplished overnight. The commitment of the central government to extension reform was a major asset in India—and in many of the Asian countries where the system has been introduced—and was thus a large part of the reform's success. In many situations, such support cannot be assumed because the T & V system may be nothing short of revolutionary, involving fundamental changes in the philosophies, organization, and operations of the central government and its agencies. Bureaucratic inertia and, sometimes, overt opposition in high places (and in places that are not so high) have to be overcome. Work habits, undisturbed perhaps for decades, have to be changed. Attitudes of research workers and the content of their work programs have to be amended, sometimes quite drastically. Whole new cadres of staff, such as the SMSs, have to be created, often in situations of acute shortages of potentially suitable personnel and in the face of budgetary stringency, particularly as it relates to the payment of salaries and allowances. As a result, in some projects the T & V system has not yet been fully implemented.

A change in attitudes is particularly crucial at the field level, where the producers and transmitters of technological innovation meet the consumers of these services. Both the farming population and the extension staff have to be reoriented and retrained to play a significantly more active role than many have played before. Such reorientation and retraining involves more than the acquisition of new and reformulated technical knowledge. It also involves refinement of communication skills; a readiness and ability to absorb regular and frequent updating of knowledge; a recognition that hitherto often casual approaches to field visits and farmer contact will not be tolerated; an understanding of the sociological and cultural structure of the village community and of the flows of information within it; and, perhaps most important, a readiness to listen to farmers, to seek to understand and evaluate both their long-term and short-term problems, and to convey this information back up the chain of command so that remedial action can be taken at the appropriate level.

In India, extension had been a weak link in agricultural service distribution; marketing systems were relatively good, and supplies of inputs were available—as were technical recommendations that had not reached the average farmer but were capable of increasing productivity. Once the extension service was reorganized along T & V lines, yields went up, and success strengthened the dedication needed to make the system work. Now that it has been in place for a few years, however, latent problems are emerging, many of them arising out of the fundamentally different approach to agricultural extension embodied in the T & V system. Administrative norms and procedures still emphasize office not field work, as do supervisors; rural development strategies are still sometimes at odds with the single-purpose function of the extension worker; difficulties are still arising in concentrating research and adapting technologies to meet farmers' needs; and so on.

Opposition to the system has sometimes come from vested interests threatened by reorganization and the potential loss of control over a large work force of VEWs. This

opposition is frequently voiced as a philosophical commitment to the multipurpose approach. Particularly in India, this commitment is not merely superficial or self-serving; it is deeply embedded and sincere among many agricultural staff, who believe the single-purpose approach of the T & V system will prevent effective local participation and somehow obstruct development of broader areas. When experience with the system grows, these concerns should fade as people realize that more productive agriculture provides a stronger base for broader regional development.

It is now recognized that ten to fifteen years are needed to establish the T & V system. In India, since staff were formerly multipurpose workers reporting to a Community Development Ministry, a major change was necessary to redeploy them within a single chain of command in the State Agriculture Ministries. This entailed not only the change in philosophical attitudes already discussed; it meant a major shift in political power between ministries. Ultimately, adopting the T & V system should create a more manageable structure, but in the short run the administrative problems of merging a heterogeneous staff into one unified cadre can pose extremely difficult management problems. Mergers in India have led to friction among personnel and to delays in project implementation.

Setbacks have occurred elsewhere and for other reasons. Some key positions have been filled with officers who have had little understanding of, or commitment to, T & V extension work. In some instances the selection of representative contact farmers has been difficult. The evaluation of a World Bank project in Thailand found the contact farmer's role poorly emphasized and recommended that, instead of being chosen by the headman, the contact farmer should be selected by a village committee so that he would be more representative of average farmers. Finally, in some projects the T & V system is simply inefficient. Again in Thailand, until recently there has been little evidence of farmers' communicating with contact farmers; SMSs have not interacted with researchers and have become involved with administrative chores.

It is proving more difficult than anticipated to adapt the T & V system to areas where budgets are tight and technical recommendations sparse. These problems are most common in Africa. Three-quarters of the projects using the system in West Africa mention the lack of local funds as a major problem. The absence of technical recommendations sets in motion a vicious circle of too little contact between farmers and of extension workers' giving too little guidance to research, which in turn further weakens the relevance of extension advice. The sociology of African settlement patterns, which are often highly scattered, is substantially different from the sociology of the Asian village, with its high population density. In areas where there simply are not the resources, either human or physical, to establish such a concentrated, interlocking system, the T & V system has to operate with more limited horizons to avoid losing its credibility.

Nevertheless, there have been some signs of successful adaptation of the system to conditions in Africa. Three years after being established, the T & V system has perceptibly improved cotton and food crop yields in an IDA-financed project in Upper Volta. Extension workers are reaching an estimated 100,000 farmers, who have increased their use of fertilizer and improved grain varieties and who are receiving more credit. Before the T & V system was established, extension workers had many unclear responsibilities and little training; now they receive training and refresher courses and concentrate only on extension work for three days a week (village groups are organized to manage input supplies and to distribute credit). The changes have been introduced without increasing staff numbers or creating upheavals in the existing organizational structure.

These difficulties, rather than demonstrating a weakness in the approach, show that it had seemed perhaps deceptively simple to implement the T & V system in the early days.

While its main ideas are straightforward, its concentrated approach requires a radical change for extension work in most areas—in the focus on field work, in procedures, and in the attitudes of staff at all levels. Once a system has been reorganized, it has to be monitored continuously for improvements to be maintained (see Cernea and Tepping 1977). This can be done only by field supervision of extension work and farmers' responses, by monitoring the relevance of research work, and by training sessions—all of which require substantial commitment.

THE CHIANG MAI WORKSHOP

The general objective of the workshop from which this volume originates was to evaluate experience with the T & V system by identifying, first, those aspects which had been successful and how these could be replicated and, second, the problem areas and how they could be improved. An equally important aim was to stimulate a continuing exchange of ideas on the subject.

The workshop brought together practitioners directly involved with the management and implementation of the T & V system in six of the Asian countries where it is being used, participants from Africa, and project staff from the World Bank, the United Nations Development Programme, and the United Nations Food and Agriculture Organization.

As the following chapters will indicate, the discussion was structured around papers presented on five major issues. The first, on farmer participation and the VEW (chapter 2 and comment in chapter 3), dealt directly with the fundamental issue of how to maximize the effectiveness of the T & V system at the field level. The paper discusses the Indonesian experience, in which extension activities have been successfully grafted onto an existing sociocultural system. The second topic, development of technical recommendations and research-extension linkages (chapter 4 and comment in chapter 5), is crucial to the credibility of the extension service, which depends on the relevance of its recommendations, especially when the responsibility for research and extension lies—as it frequently does—with different institutions. The paper addresses the topic from the Indian perspective.

The question of how to adapt an existing extension organization to the T & V system has raised difficult issues and is continuing to do so. The workshop addressed it from two angles, the third and fourth topics—the planning and implementation of training programs (chapter 6 and comment in chapter 7), and management and system maintenance (chapters 8 through 10 and comment in chapter 11). Training is an essential part of the system once it is functioning, but in most situations it is also needed to reorient staff at all levels, not merely those concerned with extension, toward the system's emphasis on field work and participation. This adjustment often requires—as has been stressed—fundamental changes in attitudes among extension workers as well as supervisors. The paper on training presents Sri Lankan experience. Management issues are a major source of problems in several projects, yet the management principles of the T & V system are crucial to its success. To incorporate them effectively into an existing system, one needs to minimize disruptions, to identify the more successful procedures, and to understand how to engage and maintain commitment at all levels. A key corollary is that the management of the system should allow it to expand to meet an increasing demand for its services. Three papers address management issues from the perspective of experiences in Thailand, the Philippines, and Nepal.

The fifth and final topic examined was monitoring and evaluation (chapter 12 and comment in chapter 13), which has a key contribution to make in the dynamism of the

T & V system. In most extension services, the evaluation unit set up for the system is a new one, and objectives and processes have to be established *de novo*, as the paper giving the experience in Thailand attests. Much of the Asian experience with monitoring and evaluation has been in India and is still limited, but there are some successes—particularly with the use of sociological case studies—to be shared. In addition to the country-specific keynote papers and the more widely ranging commentary, a concluding chapter on the issues and experiences addressed at the workshop, placed in current perspective, has been prepared by the editors of the volume.

As the following chapters illustrate, there was a broad consensus among participants that the T & V approach has substantially improved the effectiveness of extension services in the Asian countries represented. It is hard to quantify, but strong and continuing demands for services from farmers involved in the system, as well as the continuing and substantial motivation and commitment of the extension workers, are sufficient evidence of the soundness and acceptability of the system's precepts. There was also general agreement that an important element in improving overall effectiveness of the T & V system is an understanding of local sociocultural factors that affect communication between those with a message to give and their audience (see Cernea 1981). Many operational problems remain, and more work needs to be done to make the system more readily applicable to rainfed conditions and to low-potential areas with weak infrastructural support (see a recent contribution toward this end, Russell 1981). However, the recognition of these problems and the constructive nature of the discussion presented in the ensuing pages will leave the reader in no doubt of the basic health of the T & V system and the dedication of its practitioners in promoting its success.

REFERENCES

- Benor, Daniel, and Michael Baxter. Forthcoming. Agricultural Extension—The Training and Visit System: An Overview and Agricultural Extension—The Training and Visit System: Operational Notes. Washington, D.C.: World Bank.
- Benor, Daniel, and James Q. Harrison. 1977. Agricultural Extension: The Training and Visit System. Washington, D.C.: World Bank.
- Cernea, Michael M. 1981. "Sociological Dimensions of Extension Organizations: The Introduction of the T & V System in India." In Crouch and Chamala 1981, vol. 2, pp. 221-35, 281. Also available as World Bank Reprint Series no. 196, Washington, D.C.
- Cernea, Michael M., and Benjamin Tepping. 1977. A System for Monitoring and Evaluating Agricultural Extension Projects. World Bank Staff Working Paper no. 272. Washington, D.C., December.
- Crouch, Bruce R., and Shankariah Chamala, eds. 1981. Extension Education and Rural Development. 2 vols. Chichester, U.K.: John Wiley.
- Russell, John. 1981. "Adapting Extension Work to Poorer Agricultural Areas." Finance & Development, vol. 18, no. 2 (June), pp. 30-33.
- World Bank. 1982. World Development Report 1982. New York: Oxford University Press.

**Farmer Participation
and the Village Extension Worker**

2

Farmer Participation in the Training and Visit System and the Role of the Village Extension Worker: Experience in Indonesia

Dady Ganda Sukaryo

The major objectives of the government of Indonesia in the agricultural and rural sector are: to create productive employment to raise the incomes of the rural poor; to increase domestic food supply to keep pace with rising demand; to expand agricultural exports, particularly of smallholder tree crops; and to ensure the productive, sustainable use of land, water, and other natural resources.

To achieve all these goals simultaneously and in a timely manner, the government is trying to strengthen agricultural extension services, first for food crops and later for other commodities. To this end, the first National Food Crops Extension Project (NFCEP) was established in 1976 with donor assistance from the World Bank. The four-year project progressively covered nine major food-producing provinces and introduced the Training and Visit (T & V) approach to agricultural extension.

The government was so impressed with the achievements of the T & V system that, with further assistance from the World Bank in 1980, it expanded NFCEP to cover the entire country and to include commodities such as estate crops, livestock, fish, and forestry products. There are approximately 15,000 extension personnel in Indonesia. The objectives of the second phase of NFCEP were to raise the agricultural productivity of nearly 16 million smallholder farm families by the systematic transmission of improved techniques, plant varieties, and inputs and by means of expanded and well-organized T & V extension services.

The government has stressed the strengthening of the T & V system in all provinces for each commodity. Particular attention has been paid to developing and motivating farmer groups, setting up and operating Rural Extension Centers (RECs), and improving the linkage between research and extension. An evaluation of the T & V system conducted by the Padjadjaran University in 1981 showed that the primary constraints to establishing and reforming farmer organizations can be solved with the implementation of the T & V system. Since 1977, an important element of the revised T & V system has been to carry out extension activities only through farmer groups and to reorganize existing groups on the basis of the proximity of the farmers' fields rather than of their dwellings in the village. Farmer groups are established to cover approximately 100 farm families; in irrigated areas of Indonesia, this usually has meant a coverage of approximately 50 hectares per farmer group.

The impact of the T & V system in the early stages has shown several positive results compared with the previous traditional extension methodology:

- Seasonal extension programs have been based on improving farmers' existing farm systems, recognizing their major needs and constraints, as well as on government needs.

- The regular fortnightly training of Field Extension Workers (FEWs; village extension workers, or VEWs, in Indonesia; also called *Penyuluhan Pertanian Lapangan*, PPL), which is supported by Subject Matter Specialists (SMSs) in constant touch with research, and the regular visits of the FEWs have given these workers a credibility with farmers that was seldom attained previously.
- Contact farmers have played an important role in motivating other farmers and in keeping the system dynamic.
- Seasonal extension programs have improved as the FEWs have reviewed adoption of critical "impact points" by farmers each season with their immediate Field Extension Supervisors (*Penyuluhan Pertanian Madia*, PPM, an Agricultural Extension Officer, or AEO, who usually supervises six to eight FEWs) and SMSs, who devise the program of topics for training after consultation with research and also oversee adaptive trial programs to meet farmers needs.

This paper will examine the Indonesian experience in setting up farmer groups and in selecting contact farmers; the conduct of the FEW's visits and his interaction with the groups to encourage farmer participation and to ensure that feedback from farmers is obtained and utilized in revising extension programs; and the general role of the FEW in extension efforts.

FORMATION OF FARMER GROUPS: SOCIOCULTURAL AND ADMINISTRATIVE CONSIDERATIONS

In selecting farmer groups, villagers were divided into two strata: an "upper layer" and a "lower layer." In general, one-third to one-fifth of the villagers were in the upper layer, which contained the more progressive farmers (*Petani Maju*), those who were responsive to new technology and were willing to participate in activities oriented toward the modern economy. The lower layer had the opposite characteristics and comprised the more reluctant or nonadaptive farmers (*Petani Biasa*, or "follower" farmers). In establishing a farmer group, both layers were included so that lower-layer farmers could benefit from upper-layer ones. Groups were also formed on the basis of farmers' fields being close together.

In the past, most villagers in Indonesia lived in a communal tradition, but with the present pace of economic change and the departure from a purely subsistence economy, the tendency has been for villagers to become more individualistic. One can distinguish the communal tradition from the "dynamic individualistic" tendency, but to create and develop the production and welfare of farmers we have found it best to identify and link the best features of the communal tradition with the incentives of dynamic individualism in a compact cycle of activity.

Rural people in Indonesia have lived and worked for centuries within strong communal groups or cooperatives such as *subak* (farmers' association for use of irrigation water), *gotong royong* (farmers' self-help association), *mapalus* (farmers' mutual assistance association). These have clear membership, individual affiliation with the power of the chosen leader, and high loyalty to the leader on the part of individual members. For implementing the T & V system in Indonesia, the farmer group is the focus for the activities of guidance and technology transfer. This strategy seeks to harness and to adapt traditional group and power structures with the support and guidance of the government.

The traditional group (subak, mapalus) activities have a close parallel with those of the T & V system. These groups have regular meetings (every thirty-five days) to discuss field problems, to review implications of government policy and technology recommendations, and to try to apply the new technology. Thus, it has not been difficult to adapt traditional sociocultural associations to form groups for agricultural extension purposes.

Experience has identified several considerations important in forming farmer groups:

- The field area to be covered, which defines the group membership
- The selection and motivation of formal and informal leaders
- The common goals of the group members
- The need to form cadres or subgroups to serve better those farmers with different resources
- The way in which the group will function.

In Indonesia farmer group formation is based on contiguous field areas (approximately 23–50 hectares per farmer group), although in other sectors we still have domicile or village-based groups. The borders of the farmer group areas were decided mostly on the basis of different physical conditions as follows (percentages based on number of farmer groups studied): village border (34 percent), size of area (20 percent), natural border (19 percent), village road (11 percent), irrigation canals (11 percent), uniformity of cropping system (3 percent), number of farmers (3 percent). The number of farm families in each group was not the same but varied depending on the average landownership in the region. In general, there were approximately 100 farmers and their families in each group: 1 contact farmer, 24 progressive farmers (from the upper layer), and 74 followers (from the lower layer).

In areas where many farmers lived close together, the area of the farmer group was small, and demarcation of the area was decided by natural features such as canals, road, forest, or village boundary. For instance, one region had 300 hectares of rice fields, with an irrigation canal and a road as the border; it was divided into six farmer group areas, with the size of the group areas differing because of farm size. Selection criteria for the groups emphasized similar purpose, same activities, easy communication among group members, and whether weekly or monthly activities could be arranged and done together by group members.

Year by year, farmer involvement in group activities tends to increase. The quality and the dynamics of the group will vary, but it is important that the farmers themselves are satisfied with their method of operation. They should be able to contact directly similar groups so that they can discuss mutual interests such as how to increase their income, and they should be able to contact the extension worker regularly. An evaluation study in 1980 found that the main reason that farmers agree to consolidate themselves into groups is to increase production (63 percent of respondents); only a small minority (3 percent of respondents) join because of social pressure.

The effectiveness of farmer groups depends on the degree of interaction within the groups. Social interaction tends to grow because the task of the extension services is to motivate and maintain permanently the social interaction among group members and between the group and the external institutions concerned with agricultural development. Through internal interaction, groups discuss, summarize, and decide on technology appropriate for members, maintain loyalty, and monitor and evaluate their work program seasonally.

The administration, as well as the extension service, uses the farmer group as a means of realizing production targets and as a channel to distribute production inputs. An

important task of the local administration is to protect the group dynamic and group interaction from the interference of external institutions that might deflect members from their agreed objectives. The role of the local administration (such as governor, head of district, head of subdistrict) in motivating the farmer to join the extension activities is very significant, and PPMs (AEOs) can draw on this support in supervising FEWs and helping them to interact with farmer groups. For this reason the local administration has an important position, helping to motivate the whole extension operation in the field. The farmer group in Indonesia was the embryo of the Special Intensification (INSUS) Program, which has been expanded to the entire country. Production of rice increased significantly in 1979-80 to 3 tons per hectare on average; a 20 percent increase over a five-year period. The FEWs have obviously had an important role in achieving such success—in maintaining and supporting the communication of the group with other social institutions and in guiding the farmers in practicing new technology in their own fields.

Every year the government of Indonesia selects the best farmer group in the country to create an incentive to motivate the growth and development of farmer groups. The competition encourages farmer involvement in the program and raises the social status of the program. Farmer groups are classified in three categories based on increasing degree of dynamism and development: elementary groups, advanced groups, and madya groups. A group achieves madya status when the majority of its members have adopted the recommended improved practices. Through the program, the farmer groups move on to the cooperative system, known as utama, which has a strong legal foundation and more formal constitution. The groups most willing to increase production transform the traditional sociocultural groups (subak, gotong royong, and so on) into a fundamental cooperative system, or utama, that is officially registered. This is a logical evolution consistent with the demands of moving from a subsistence to a cash economy based on modern technology requiring purchased inputs. The growth of the farmer groups and the formation of the cooperative are mutually reinforcing.

To summarize, the positive organizational features of farmer group operation are that all the recommendations approved by the group are applied as far as possible by all members of the group; that the constraints and difficulties faced by the farmers are shared in their meetings and as far as possible resolved; and that the contact farmers supervise the followers in practicing the new technology after their own discussions with the FEW and the FEW's practical demonstration.

SELECTION AND ROLE OF CONTACT FARMERS

In Indonesia, contact farmers must be responsive to innovation and willing to use new recommendations, must be capable full-time farmers who are land-owners and not tenants, and must be recognized as able leaders. Although the FEW explains to a new group the criteria for selection of the contact farmer, he plays no part in the appointment itself; the group elects the contact farmer as its leader in a democratic way. This process ensures the election of dedicated and able farmers who are widely recognized as such by group members. In the last evaluation it was noted that formal education has been an important attribute in selection, but in this attribute the contact farmer was no different from other progressive farmers in the group. In general, the follower farmers were not formally responsive to innovation but awaited the leadership of the contact farmer, adopting new techniques after contact with him or after informal contact with other progressive farmers in the group.

On the basis of this evaluation, contact farmers appear well qualified to lead their groups, and communication between them and members generally works well. The full group membership participates in less than 30 percent of decisions; over 70 percent of decisions are made by an elected committee comprising the contact farmer and some other progressive farmers. Through these committees the groups plan their own short-term and medium-term programs. A survey of the range of typical activities implemented by groups in their programs shows the following: water management (82 percent), plant protection (77 percent), sprayer purchasing (62 percent), seed purchasing (44 percent), insecticide purchasing (36 percent), fertilizer purchasing (33 percent), and crop marketing (1 percent).

The adoption of innovations by farmers has been reflected in attitudinal changes. Whereas farmers' attitudes changed slowly when the individual approach was used, such change has become much faster with the group approach. In the group, membership is based on an informal and close relationship; the members themselves create the dynamic, and often they adopt innovations as a package.

Figure 2-1 illustrates the transfer of messages within the farmer group and shows that the FEW is the dominant source of information for the farmer. The percentages of messages transmitted show that the progressive farmers have played a small role in conveying technology from the FEW to the followers. The original concept was that every progressive farmer would convey technological information to the five neighboring farmers whose fields surround his own: if twenty progressive farmers get the information directly from the FEW, and if every progressive farmer conveys the information to five followers, then all farmers in the group would get similar information from the extension workers. In practice, however, followers are getting most of their information directly either from the FEW or the contact farmer. In the future, the meeting during the FEW's visit should be attended by more farmers.

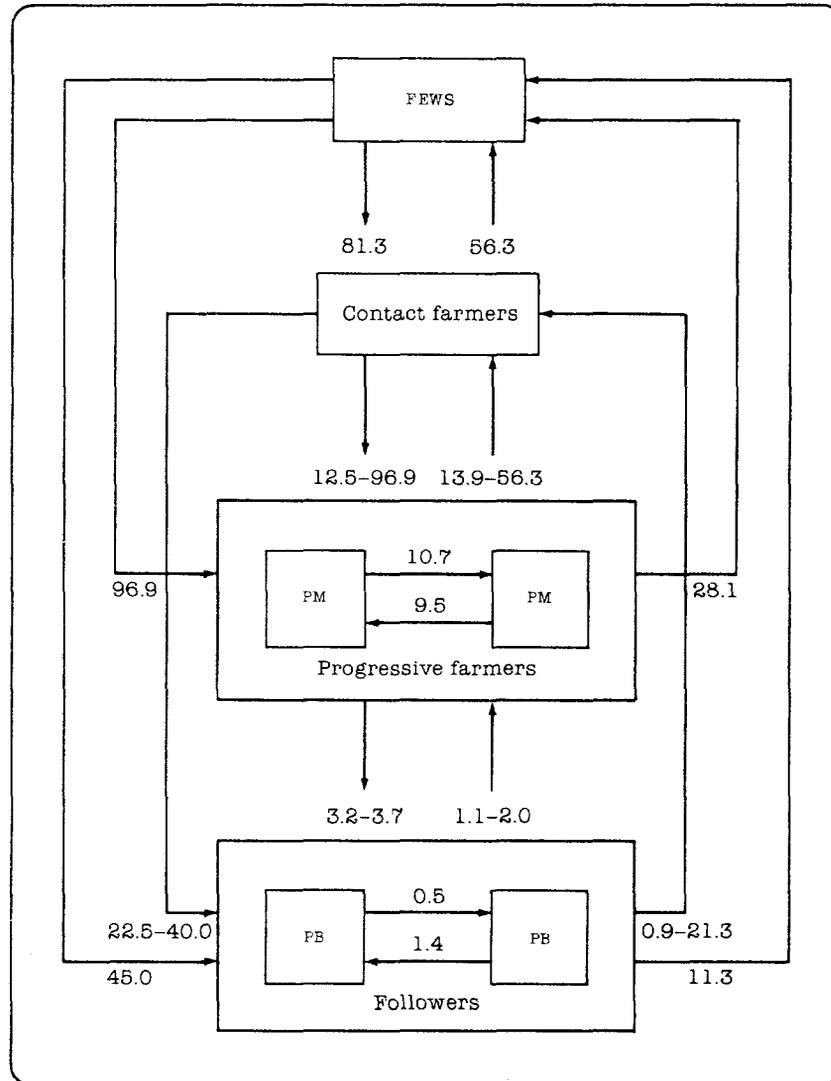
CONDUCT OF FIELD EXTENSION WORKER VISITS AND METHOD OF ENCOURAGING FEEDBACK FROM FARMERS

The central strategy of the T & V system is to concentrate effort. The success of the FEW's visit has depended on (1) whether the topic for the visit is relevant to the farmer's need and is presented in a way compatible with the farmer's experience and knowledge; (2) continuous motivation to develop the farmer group; (3) meeting and motivating the formal leader (contact farmer) and informal leaders (progressive farmers) involved in the extension activities; and (4) whether all, including the follower farmers, are willing to adopt the innovation and practice it systematically.

The FEWs are regularly scheduled to visit two farmer groups a day. Each FEW supervises one field extension area, FEA (or village unit area, VUA, in proposed new terminology; the VUA typically covers 800-1,000 rice fields and a similar number of farmers), covering approximately 1,000 hectares (when irrigated) divided into sixteen farmer group areas. The size of the farmer group areas does not depend on any rigid rule but rather on the physical features of the area.

To get the best results from the visit, the FEW prepares the topic of the visit and the schedule for visits with regard to the farmers' need and the requirements of the season. Our evaluation in 1980 found that all the FEWs prepared the topics for their visits by taking the following factors into consideration: cropping pattern and condition of area, level of knowledge of farmers, economic viability, and topic assigned. The time schedule selected for the visit was based on the following factors: physical condition of the area, attitude of the farmer, appropriateness of the impact point for that time, and program of

Figure 2-1. Flow of Information among Field Extension Workers (FEWs), Contact Farmers, Progressive Farmers, and Followers in Indonesia
 (percent of messages transmitted)



PM = Petani Maju, progressive farmers.
 PB = Petani Biasa, follower farmers.

the FEW. These findings indicate that the FEW visits were usually implemented with the preordained extension program as a guide, but that it was always important to adapt the program to the farmers' particular conditions and the nature of the season.

One of the most difficult tasks of the FEW is to persuade the rural masses to accept and put in practice the extension recommendations. This basic objective of the extension agent can be achieved more quickly if the FEW maintains regular contact with the farmers. This task was impossible without a high degree of mobility to ensure timely visits and supervision of staff. Under the project 75 percent of SMSs get motorcycles and 25 percent get jeeps; 100 percent of PPMs get motorcycles; 25 percent of FEWs get motorcycles, and the rest of FEWs get a horse, a boat, or a bicycle (depending on their area).

The two PPMs at the REC (one a programmer and the other a supervisor) spend four days a week supervising all the FEWs. The supervisor from the REC conducts his duties by a scoring system involving both the FEWs and group farmers. In particular, he checks the adoption rates for each innovation at the farmer level. He collects this input from the FEWs and farmers on a random basis and discusses it at the next week's meeting or training session at the REC.

The SMSs spend a third of their time training the FEWs at the REC, a third of their time solving problems in the field, and a third of their time contacting their technical resources (including the local university, research station, and successful farmers). The technology for all commodities is normally available within the research establishment. Coordination between research and extension for all subsectors is established through technical committees. Several such committees at national, provincial, and district levels have been constituted under the project, and research stations provide regular support to the extension service through the monthly meetings and occasional field visits. The transfer of technology and knowledge is channeled through SMSs, who in turn transfer it to PPMs and FEWs in fortnightly training sessions.

The appropriate technology produced by the government's Research Department and the Agriculture Directorate are continuously distributed to extension workers through this regular training. Fortnightly training sessions are conducted by the district SMSs, although they are also occasionally attended by provincial SMSs. The topics for training are selected by the SMSs themselves. To monitor and evaluate constraints at the field level as well as at the level of farmers' ability, every season an evaluation by random sampling reviews the degree of adoptive innovation. The PPM selects the impact point from the FEW, who conducts a mini-survey in every season to collect suggested impact points from the farmers. The PPM visits four of a FEW's sixteen groups and from each selects one contact farmer, four progressive farmers, and eight followers for the purpose of identifying adoption of relevant impact points. Each selected farmer is evaluated on five points of crop intensification (for example, tillage, seed use, irrigation, fertilizer use, and plant protection). Where the intensification of these points is poor, the FEW suggests revised topics for fortnightly training. Impact points to cover these shortcomings are worked out by the PPM in consultation with the district Head of Extension and the SMS. The topic of training and the topics of the visits for the next season will emphasize these impact points revised in light of the survey information.

This method helps to encourage feedback from the farmers, but in addition the FEWs are encouraged to collect farmer reactions on a continuous basis and to report back at each meeting. Besides the seasonal program of impact points, diaries have been distributed to all FEWs, PPMs, and SMSs; every day the FEW collects this feedback from the farmer and brings it to weekly REC meetings to resolve problems with the PPM and SMS. If the problem cannot be solved by them, they refer it to a senior level at the Kabupaten (district) headquarters. The Kabupaten-level staff try to solve the problem, and this process

continues up to the research station if necessary. These diaries also serve as a built-in control for activities in the field.

ROLE OF THE FIELD EXTENSION WORKER

All newly recruited FEWs receive three weeks of orientation training in the T & V system and in communication techniques. Fortnightly training of FEWs is given at RECs, which have suitable training facilities. Apart from classrooms, the REC generally has audio-visual equipment, teaching aids, and 1.5-2.0 hectares of land for practical and specialized agricultural training. Training topics consist half of theoretical matter and half of practical instruction; a topic is selected after discussions among the FEWs, PPMs, and SMSs to ensure that it is relevant to farmers' immediate needs.

Forty percent of the information and recommendations received by the farmer is delivered through the FEW. The information transferred by the FEW is devoted 71 percent to rice agronomy, 12 percent to secondary crops and horticulture, 1.2 percent to post-harvest technology, 0.7 percent to other commodities, and 15 percent to social interaction and communication techniques. Every month the Technical Committee of senior experts and researchers distributes additional information and appropriate technology emphasizing secondary crops and horticulture, the post-harvest season, and other commodities to support the know-how of FEWs; previously the main emphasis was on the major staple crop, rice.

To summarize, the T & V extension system in Indonesia is mainly concerned with the effective delivery, to farmer groups through the FEWs, of agricultural innovations that are required for increasing rural production and income. This transfer of information and improved technology, particularly for rice, has had a definite impact on crop production. By and large, in all the farmer groups there are now many farmers who not only know the recommended practices but also use them. Farmers are found who use chemical fertilizers in almost optimal doses and who also take measures for plant protection. According to 1981 World Bank data, some farmers have annual rice yields of 8-10.5 tons per hectare from a double crop system.

The growth and development of farmer groups depends on the activity of the farmer group itself as well as on that of the FEW. Support from the FEW is essential for successful implementation of the farmer group's work program, and this support has to be based on farmers' technical ability, correct production inputs, and timeliness of measures according to the season.

Good planning for the farmer group has to consider farmers' technical capability and resources. Thus, the FEW assists the farmers in summarizing the resources needed (manpower, production inputs, equipment, and funds) and supports the farmers in analyzing their farm management needs to get the maximum profit. Social interaction within the group, and particularly between the group and external institutions, certainly depends initially on the activeness of the FEW, who must identify the main constraints to developing group interaction.

The achievement of the FEW's optimal performance depends on his dedication, behavior, education, and understanding of his present task and future career. To maintain and increase the ability and credibility of FEWs, the government is reviewing career planning for extension personnel. As far as possible the government of Indonesia, partly using the assistance of World Bank loans, provides improved housing (for PPMs and SMSs in districts and for FEWs in transmigration and remote areas), transport to ensure mobility, and relatively good salary to attract competent staff. Selected extension personnel have a

chance to continue their education at universities in Indonesia and, in some cases, abroad. To supervise 15,000 extension personnel is not easy, but without an improved extension system it is impossible to increase agricultural production and farmers' income. Although further improvements can certainly be made, the T & V system is helping to revitalize Indonesia's agricultural extension services.

3

Farmer Participation and the Village Extension Worker: A Comment

John F. A. Russell

The topic "Farmer Participation and the Village Extension Worker" was chosen for the first day of the Chiang Mai Workshop to emphasize that the success of extension ultimately rests at the field level, for it is here that the vast majority of the technology transfer to the farmer takes place and here that the interface with the farmer and feedback from him help to make extension and supporting research programs more relevant to the farmer's needs. All other staff involved in the Training and Visit (T & V) system are supporting the Village Extension Worker (VEW) to do his job more effectively, and so it is also vital that they should all be spending time at the field level to help guide the VEW and to monitor and address problems as they arise—thus ensuring that technology is relevant and has been adapted to different farmers' needs and to different ecological zones.

A further basic premise is that to service large numbers of small farmers is costly—rarely can any country afford the luxury of having more than 1 VEW per 600–800 farmers—and so to reach all farmers one has to work through a group approach, or at least with individuals in a defined group. Furthermore, the stronger the participation of beneficiaries in all aspects of a program—from planning to evaluation, not just in implementation—the more successful the program is likely to be. This leads us to the importance placed in the T & V system on farmer groups and on developing leadership within them.

The issues we wish to discuss include:

- Farmer group selection and development
- Selection and role of the contact farmer
- Procedures for improving feedback from farmers
- The role and effectiveness of the VEW
- Incentives for VEWs and farmers to maintain an effective system.

Dady's paper (chapter 2) gives a good insight into Indonesia's experience in this field, and it is apparent that there are good communal structures at field level to build on in Indonesia in many cases.

GROUP SELECTION AND DEVELOPMENT

What should the main criteria be for group selection? What are the advantages of using existing groups, and are there disadvantages? If so, how does one try to overcome them?

The number of days for visits broadly dictates the number of groups—usually eight in the classic system with fortnightly visits—but if farmers are more scattered, is it feasible to have sixteen groups and to cover two in a day? In any event, while a day's work may

cover one group containing 60–100 farmers, or two groups of 30–50 farmers, it is likely to be necessary to have subgroups to represent different resource levels of the farmers, sharecroppers, or women. If the major enterprise is tree crops, monthly visits may be adequate, so that more groups, and thus farmers, can be covered by one VEW.

Arasasingham (1982) from Sri Lanka writes in his paper of the ease of dealing with farmers on contiguous blocks in irrigation schemes and of the greater difficulty with more scattered farmers in rainfed areas, especially those using a shifting cultivation system. He also recounts how in Sri Lanka the special problems of areas with mainly part-time farmers were overcome by scheduling visits in the early evenings and the normal rest day, with the VEW taking his day off in mid-week.

Majumdar (1982) from Assam, India, has raised the problem of dealing with dispersed tribal peoples in more inaccessible areas, and Raina (1982) from Rajasthan, India, says this problem was tackled by increasing the staff-to-farmer ratio from 1 to 800 to 1 to 500. In some cases ratios as low as 1 to 200 to 300 are being used. There is not always the budget to do this, however, although it can more easily be justified on a short-term basis. The conjunctive use of other media, such as radio, is important; when effectively combined with field visits, use of media may reduce the need to increase staff-to-farmer ratios.

Rentutar and Aquino (chapter 9) describe a different approach in the Philippines, where different types of farmer groups exist for production, home improvement, and rural development activities for youth, and where there also are three different workers in each area serving each group. The production VEW visits his groups every week, the home economist visits fortnightly, and the youth adviser visits every four weeks, but this schedule implies a density of field staff that few countries can afford to replicate.

Factors which require consideration when planning group formation and the visit schedule include:

- The nature of the farm system and cropping calendar, which will largely determine the most appropriate interval between visits
- The need, since the major emphasis is going to be on interacting with the farmer in his fields, for groups to be formed around contiguous land areas, rather than village neighborhoods, when the farmers reside in nucleated villages
- Where farmers each live on their holdings, the difficulty of holding group activity; if population density is low, the need for groups, and thus VEW-to-farmer ratios, to be smaller
- The variance of group activity with the cohesiveness of the local society.

On this last point, in some cases, although farmers are grouped for the purpose of the day of visit, they may have to be dealt with largely as individuals. While this is likely to reduce impact, when a farmer adopts an improved practice his field becomes a living demonstration, and neighbors may see and copy the practice with little active dissemination by the original adopter. At the other extreme, as we have seen in some of the Indonesian cases, groups are extremely cohesive, and all may agree to adopt the same new practice at the same time.

The other issue that Dady describes in Indonesia is the gradual evolution of groups to take on more tasks, with some evolving into a form of cooperative. This development is fine, but it is important that the impetus comes from inside the group and that, with outside help, the group evolves at its own pace. A key problem here is to what extent a VEW should be a group organizer and motivator as well as a professional extension adviser. Again, there can be no hard and fast rule on this, but if the VEW is to take on the group-organizing function he should be given special training for it.

ROLE OF THE CONTACT FARMER

The contact farmer has an important role to play in the T & V system, but how he plays it is likely to vary with the different sociocultural fabric of rural society. Farmers may participate in choosing their contact farmers, but this does not necessarily ensure appropriate representation. Contact farmers must be drawn to represent different classes of farmer or social group where differences exist, as they almost always do. Thailand's socioeconomic survey system is utilized in part, for contact farmer selection (discussed by Vorasak in chapter 8) identifies farmers who others currently sought for advice, and this approach helps identify the most suitable contact farmers for each resource level group.

As discussed above, in some cases the contact farmer is merely a point of contact for his group (or subgroup), but ideally better use can be made of him. Feder and Slade's studies (1982) from Haryana State, India, indicate that contact farmers spread the simpler messages to other farmers but rarely the more complex technical messages requiring considerable practical demonstration. The Assam, India (Majumdar 1982), and Orissa, India (Rama Rao 1982) papers both say contact farmers are generally not effective in demonstrating technology, and Dady (chapter 2) has told us that, while his contact farmers (only 1 per group of 100) have been effective in this regard, the other progressive farmers in the groups have not, although this was intended. In this case the progressive farmers were not representative of the average nonadopter, so now more contact farmers in each group are being elected in Indonesia to represent different resource categories.

In a recent visit to Andhra Pradesh State in India, where the T & V system is just being introduced, it was noticed that contact farmers had been carefully selected to reflect varying farm size and to give good dispersal over the land area held by the group, thus to make it easier for more follower farmers to be reached. A major error, however, was made in not recognizing the very different resources and cropping patterns practiced by farmers with and without access to irrigation. In many villages all farmers selected as contact farmers had irrigation, yet half the farmers in the village did not. In these cases it proved very important to differentiate between farmers who cultivated only under irrigation, those who had both irrigated and dryland crops, and those who had only dryland crops. It is important to remember that the farmer who has some irrigation will treat his dryland crops in a manner very different from that of the farmer who relies solely on the same dryland crops. The latter has many more risks; the former will give most of his attention to his irrigated land and is likely to be prepared to take more risks on his dryland crops.

Another point to emerge from this visit was that larger villages might have two groups of farmers, and in these cases it proved useful to visit each group on the same weekday in alternate weeks so that there was less confusion in the village on the set visit day for each group (that is, visiting Group 1 on the first and third Tuesday, and Group 2 on the second and fourth Tuesday rather than on the second and fourth Friday).

Rama Rao (1982) from Orissa mentions an interesting program for developing leadership among the more articulate contact farmers by associating some of them in biweekly training programs and by using them to help refine recommendations at the micro-level. This would seem a very positive development, and it should also ensure better feedback. In Nepal a survey found that farmers preferred to learn from VEWs drawn from their own community rather than from the more professionally trained agricultural assistants. This is an interesting finding that needs more explanation and discussion, and

it partly relates to the VEW's closer social relationship to, as well as better understanding of, the local farm system.

ENCOURAGING BETTER PARTICIPATION AND FEEDBACK

The closer involvement of contact farmers in helping to refine recommendations, as discussed above from Orissa (Rama Rao 1982), seems a sound recommendation. Presumably, occasional short courses for contact farmers in the off-season around the major themes being advocated, and their views on disseminating information and how to do it, could be discussed. In the main, of course, farmers will pass on advice in an informal manner when it is solicited by fellow farmers, and any form of group action will facilitate this.

Urs's paper (1982) from Karnataka State, India, gives specific examples of farmer feedback, and Majumdar's paper (1982) from Assam discusses the failure to adopt line sowing by some farmers and how recommendations were being reframed to assist adoption of this practice. Often, of course, the practice may not be relevant in the face of farmer constraints, in which case the constraint has to be removed or the advocacy changed.

In general, the financial aspects of technical recommendations are not as well mastered by the VEW as are the purely technical ones, but the VEW's knowledge is a vital ingredient, and more attention needs to be given to this by the Subject Matter Specialist (SMS). In Kenya, it is proposed to have a farm management SMS at district level, and other experience in this regard would be welcome. Certainly all recommendations have to be framed not only on a technical basis but also after careful assessment of their economic, financial, and social implications. Regarding financial implications and risk, VEWs have to give much more attention to ensuring that recommendations are varied for the different resource levels of farmers. An initial adopter needs to know the minimum amount of fertilizer he can apply that will still give a significant impact, and how over the years he can work up to the recommended optimum that can instantly be adopted by the wealthier farmer. Likewise, VEWs have to encourage reluctant farmers to adopt a recommendation initially on just part of a field to lower risk and to prove to themselves the efficacy of the recommendation in their context and on their soils. Too often VEWs try to persuade farmers to adopt optimal recommendations on the whole of a field (thereby getting lower adoption rates) or, especially where 100 percent seasonal credit is available, encourage farmers to take unwise risks (which may involve farmers in debt and make them even more risk averse in the future).

ROLE OF THE VILLAGE EXTENSION WORKER

All participants' papers have focused on the success of the regular T & V procedure in being welcomed by farmers and in leading to better-trained and motivated staff.

A frequent criticism, however, is that VEWs are not capable enough to deliver a professional service to farmers, and that this is a serious weakness of the system. Obviously staff will grow in their job and improve over time, but I would say in almost every case where this criticism is raised that it stems from poor supervision and guidance from senior level staff—be it the regular visit from the next supervisor in line, or the failure of the SMS or district and provincial staff to get out to the field regularly. The papers from Nepal (chapter 10) and Orissa (Rama Rao 1982) both state that deficiencies are greatest where supervision is not being properly carried out.

Furthermore, the very nature of supervision has to change; as Raina (1982) from Rajasthan states, a change in attitude from previous practice must occur, with less "rigid leadership, guiding rather than finding fault." Raina also mentions the lack of diagnostic skill by VEWs in identifying farmers' problems and in being able to suggest the need to reformulate recommendations. This skill has first to be developed in SMSs and agricultural extension officers (AEOs), the supervisory staff immediately above the VEWs, who by regular visits to VEWs also help to train them in what to look for, and it is, again, a key point for senior staff to focus on during their field visits.

Another issue that gives rise to considerable debate is the emphasis of the classic T & V approach on the single function, whereby VEWs concentrate all their efforts on giving professional extension advice and do not get involved with input supply, credit or marketing, or regulatory and survey activities. One has to take an essentially pragmatic approach in each situation. I still contend that ideally the goal should be wholly the technical extension function, to ensure that it becomes more professional, but there may be a transitory stage in which one day a week or fortnight is spent on input supply at certain seasons and correspondingly fewer farmer groups covered by VEWs. This approach was successfully used in Upper Volta, where VEWs had traditionally been involved in input supply, and was gradually phased out as farmer groups themselves took over more responsibility for it and as other agencies were strengthened or the private sector came forward to assist in the delivery. Furthermore, it should never be thought that the T & V approach ignores input supply; rather, it builds in deliberate and regular involvement of input supply agencies in both planning and training sessions—often with much better coordination than previously. In many of the Indian State projects, an additional extension staff member at the AEO or subdivisional level covers input supply and liaison with the relevant agencies or commercial outlets in the area. In every case, the VEW has to know the source of input supply, and whether the inputs are available, before including any particular input in his recommendation, and he raises the matter with his superiors when there is a local lack of availability in his area. General availability, however, should always be checked by the SMS, who is giving the fortnightly training. This is discussed in my 1981 paper and also by John Howell of the Overseas Development Institute in papers reviewing T & V extension (1982, 1983).

Mishra from Nepal has explained in his paper (chapter 10) how the dearth of field-level staff led to recruitment of farmers for this task. This approach has merit but may call for a change in procedure because rarely can a farmer become a full-time extension worker. The first T & V project supported by the World Bank, at Seyhan in Turkey, was modeled as such an approach. These experiences raise the question, discussed for contact farmers, of the pros and cons of turning the contact farmer into a paraprofessional, part-time or even full-time worker with some pay from the government. The whole role of such paid paraprofessionals needs further review, for they can be an effective way of reaching more farmers at a lower cost in permanent staff.

INCENTIVES FOR VILLAGE EXTENSION WORKERS AND FARMERS

Several participants have mentioned the job satisfaction obtained for field staff from becoming part of a functioning system with regular support from above as well as from receiving greater credibility in the eyes of farmers. At the same time, provision of house rent (or housing in remote areas with poor infrastructure) and provision of loans for transport to ensure mobility are important incentives.

A career structure and opportunities for advancement and for further training are also of key importance. Rama Rao (1982) from Orissa, India, mentions an incentive bonus scheme based on a team approach (for SMS, AEO, and VEW) that would seem a sound approach because it also encourages the supervisor to be a guide to his staff. Opportunities for promising VEWs to be sent for further study to obtain higher qualifications, without which they cannot advance to AEOs, are most important, as are procedures whereby VEWs with six to ten years' experience can advance at least to become AEOs (on the understanding that further promotion is barred without additional qualifications).

In any event, it will not be easy to run a service in which salary scales and opportunities for advancement are less good than potential alternatives for the cadre in question, so that extension staff are frequently resigning. This problem has been brought up by Majumdar (1982) from Assam, although in relation to AEO and SMS staff, and has been noted as a key problem for VEWs in a recent review of the World Bank-financed Pakistan Extension Project.

A better extension service should itself be the main incentive for more farmer interest, but the service has to be responsive to farmers' needs and able to reformulate inappropriate recommendations rapidly. Dady (chapter 2) has talked of the awards given in Indonesia to farmer groups with outstanding performance, and Rentutar and Aquino (chapter 9) of the Philippines mention giving "packages of inputs" free to contact farmers. I feel the latter is not a good approach unless it is for a trial: farmers need to be willing to invest their own resources in adapting proven recommendations, with the benefit of regular advice. Also, the whole role of the contact farmer is undermined in the eyes of the follower farmers if contact farmers get free or even subsidized inputs that are not available to all farmers.

CONCLUSIONS

In conclusion, I would repeat that no single prescription will be suitable for all rural societies, and that a careful understanding of existing rural institutions and local culture is needed in designing appropriate group activities and in defining leadership roles. Much is, however, to be learned from experience in different places, provided that the environmental settings are also well understood if transferring the approach elsewhere is being considered.

The biggest assets of the T & V system are the regular training, farmer contact, and the ability for rapid feedback to research. To put this in place effectively, however, requires understanding and constant supervision, with responsiveness to farmers' needs. It is essential to harness the farmers' own knowledge with that emanating from further adaptive research, and the means of doing this is discussed in Mehta's paper (chapter 4) and the comment by Coulter (chapter 5). The most important point is that the VEW must work with the farmer in a participatory fashion and learn from his knowledge as well as educate the farmer in appropriate new technology. The previous tendency was to teach the farmer in a top-down fashion, which usually led to limited adoption, and this has to be changed for the new approach to work effectively.

REFERENCES

- Arasasingham, S. R. 1982. "Agricultural Extension and Adaptive Research Project in Sri Lanka." Paper presented at the Asian Regional Workshop on the Training and Visit System of Extension, World Bank, Chiang Mai, Thailand, November 27-December 6.

- Feder, Gershon, and Roger Slade. 1982. "The Monitoring and Evaluation of the Training and Visiting Extension System in India." Paper presented at Chiang Mai Workshop.
- _____. 1983. Experiences with the Monitoring and Evaluation of Training and Visit Extension in India. World Bank Staff Working Paper no. 595. Washington, D.C.
- Howell, John. 1982. "Managing Agricultural Extension: The T & V System in Practice." Agricultural Administration Network Discussion Paper 8. London: Overseas Development Institute, May.
- _____. 1983. "Strategy and Practice of the T & V System of Agricultural Extension." Agricultural Administration Network Discussion Paper 10. London: Overseas Development Institute, February.
- Majumdar, N. N. 1982. "Assam Agricultural Development Project." Paper presented at Chiang Mai Workshop.
- Raina, B. M. 1982. "Agricultural Extension in Rajasthan." Paper presented at Chiang Mai Workshop.
- Rama Rao, A. S. 1982. "Orissa Agricultural Extension Project." Paper presented at Chiang Mai Workshop.
- Russell, John F. A. 1981. "Adapting Extension Work to Poorer Agricultural Areas." Finance & Development, vol. 18, no. 2 (June), pp. 30-33.
- Urs, Lingaraj. 1982. "Karnataka Agriculture Extension Project." Paper presented at Chiang Mai Workshop.

Technical Recommendations and Research-Extension Linkage

4

Developing Technical Recommendations and Research-Extension Linkages: Experience in India

N. N. Mehta

Providing enough to eat for the rapidly increasing millions of mouths throughout the world is the biggest challenge of the day. This situation is more alarming in developing countries like India, where the population growth is fastest. It requires us to ensure that our agricultural development moves fast enough to keep up with the increased pressure of a growing population. The estimates of food demand and supply for India given in table 4-1 indicate the scale of the task at hand.

AGRICULTURAL EXTENSION IN INDIA

The problems of improving agriculture were taken up seriously in India with the attainment of independence in August 1947. Efforts to this end were made through successive five-year plans, and in 1952 an agricultural extension service was started in the shape of the Community Development Programme and the National Extension Service. In the early 1960s, the Intensive Agriculture Area Programme was also launched, whereby concentrated efforts were made in specific areas to exploit the potential resources for agricultural development. Experience with these programs was encouraging; these programs were the landmarks of agricultural development. It was observed that the farmers did respond to new scientific advancement and agricultural innovation. The introduction of high-yielding varieties in the early 1960s served as a fillip toward a real breakthrough in agricultural production because it encouraged three important trends:

- A focus on the development of suitable production technology and a package of practices for each major crop
- An intensification of research for developing better high-yielding strains
- Creation of an infrastructure to support agricultural production, including establishment of village-level storage for inputs like seed, fertilizer, and pesticides through primary village-level cooperative societies; development of credit facilities; and creation of regulated markets, warehouses, and cold storage.

These developments put India on the path to agricultural self-sufficiency, particularly in foodgrains. Foodgrain production increased from 89 million tonnes in 1964-65 to 108 million tonnes in 1970-71 and to 131 million tonnes in 1978-79. Production of foodgrains in 1981-82 is expected to be around 134 million tonnes.

By 1978, foodgrain imports were eliminated. Our efforts of the last three decades took us to self-sufficiency in foodgrains, but much more has to be done for our agriculture to be

Table 4-1. Food Demand and Supply in India
(millions of tonnes)

Year	Gross demand for foodgrain			Projected supply of foodgrain	
	NCAER	Planning Commission	NCA	NCAER	Planning Commission
1980-81	135.7	163.0	146.3	137.7	165.5
1985-86	150.3	190.0	173.6	151.8	192.3
1990-91	167.1	n.a.	n.a.	168.7	n.a.
2000	n.a.	n.a.	228.5	n.a.	n.a.

n.a. Not available.

NCAER National Council of Applied Economic Research.

NCA National Commission on Agriculture.

Note: Net demand (for human consumption) plus allowance for seed, feed, and wastage.

Source: M.S. Swaminathan, "Agriculture on Spaceship Earth."

able to face the continuing population explosion. In particular, the production of crops like oilseeds, pulses, and cotton has to be increased significantly. Much is also yet to be done in the field of rainfed farming, which occupies about 74 percent of India's cultivated area.

Experience has shown that efforts so far have been able to create an awareness of scientific practices mainly among affluent farmers. A large group of small farmers—working in diversified conditions with meager resources has yet to take significant advantage of improved scientific practices. Most small farmers are yet to be brought into the fold of the new developmental process through appropriate modernization of their traditional agriculture. How to achieve this is the challenge facing us today.

THE TRAINING AND VISIT SYSTEM IN MADHYA PRADESH

The answer to this problem of how to extend the practices and benefits of modern agricultural technology lies in agricultural extension. In particular, we must reorganize and strengthen our extension services and provide them the necessary support so that research findings may help farmers solve their immediate problems and achieve higher production. This can be done with the system of agricultural extension known as the Training and Visit (T & V) system, wherein timely advice through trained personnel is made available to farmers on a regular, frequent basis.

In India we first implemented the T & V system on a pilot basis in the Chambal Irrigation Command Areas of Rajasthan and Madhya Pradesh in 1973-74. After the immediate and visible impact of the system on agricultural production in those areas, the T & V system was extended to other states of the country in subsequent years. The yield levels in Chambal of paddy, for example, improved in the range of 27 percent to 64 percent (see table 4-2).

In Madhya Pradesh, the T & V system of extension was introduced through a project assisted by the World Bank (Intensive Agricultural Extension and Research Project) in five districts in 1977-78 and then in ten more beginning the following year. Because experience of working with the system was very encouraging, the government of Madhya Pradesh decided to extend the reformed extension system to the whole state (forty-five districts) in a phased manner over the period 1981-82 to 1985-86.

The main features of the reorganized agricultural extension system in Madhya Pradesh are:

- Reorganization and strengthening of extension services on the basis of each 600 to 800 farm families being served by one locally resident Village Extension Worker (VEW), thus reducing the operational area of extension field staff
- Direct line of control within the Agriculture Department
- Regular and effective visits to farmers by field functionaries on a fixed day of visit, once each two weeks
- Effective supervision of field functionaries
- Continuous training support to upgrade the knowledge and skills of extension functionaries
- Development of strong linkages between research and extension
- Strengthening of research support.

Figure 4-1 shows the reorganized set-up of the extension system and the linkages between extension and agricultural research.

Adoption of professional agricultural extension through the T & V system has been a milestone in the march of agricultural improvement in Madhya Pradesh: it has clearly indicated that it does produce noticeable results when applied with its full methodology. Results of the system have been reflected in increased agricultural production, the increased awareness of the need to develop new strategies for higher levels of production, and the necessity of developing close linkage with research for the identification of problems and the fixing of research priorities. The T & V system in Madhya Pradesh clearly defines the role of research and extension worker to utilize the latest scientific advances to answer local problems through all available technology. Farmers cannot expect to have the best possible land with all needed inputs such as supplies, markets, and credit. They will always face constraints. The role of extension is to ensure that the knowledge and skill of farmers is continually enriched through their access to the continuous developments in agricultural research.

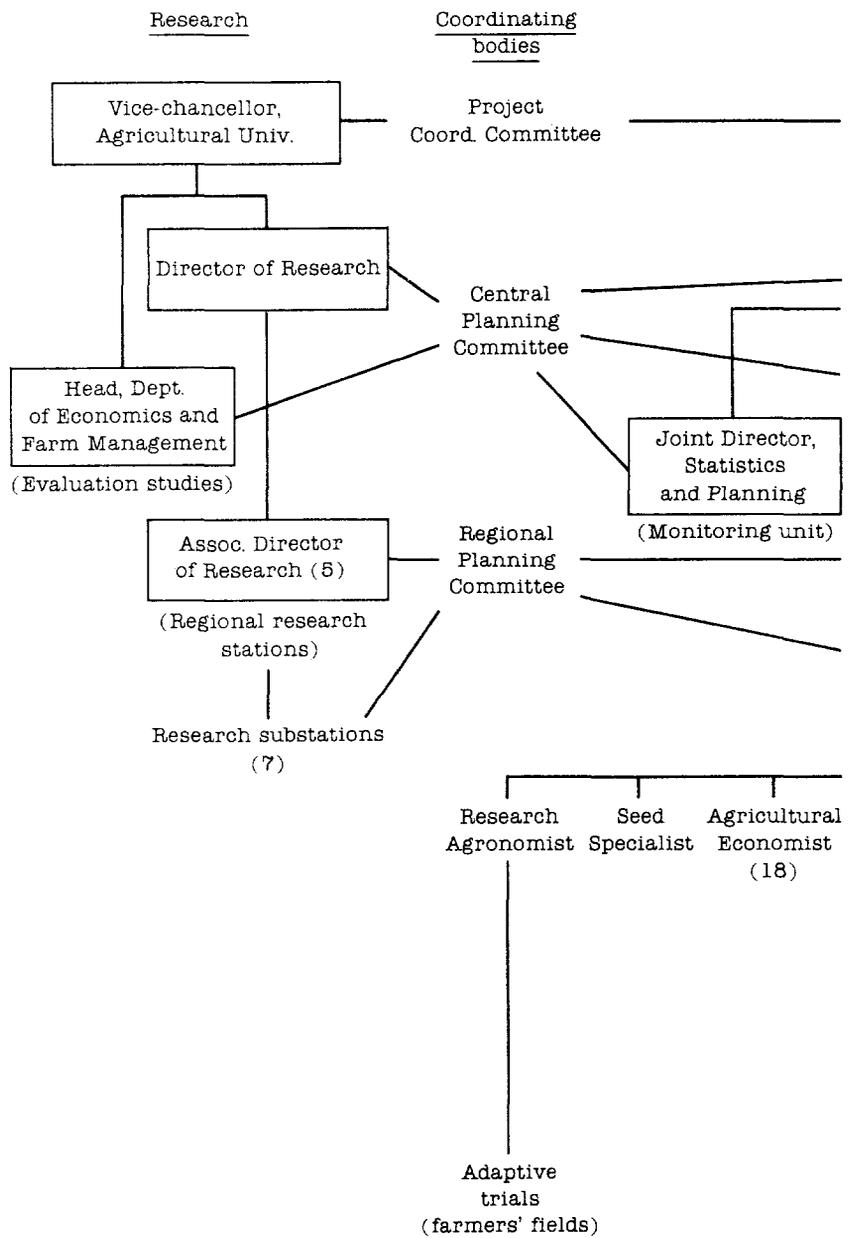
EVALUATION OF CONSTRAINTS TO PRODUCTION

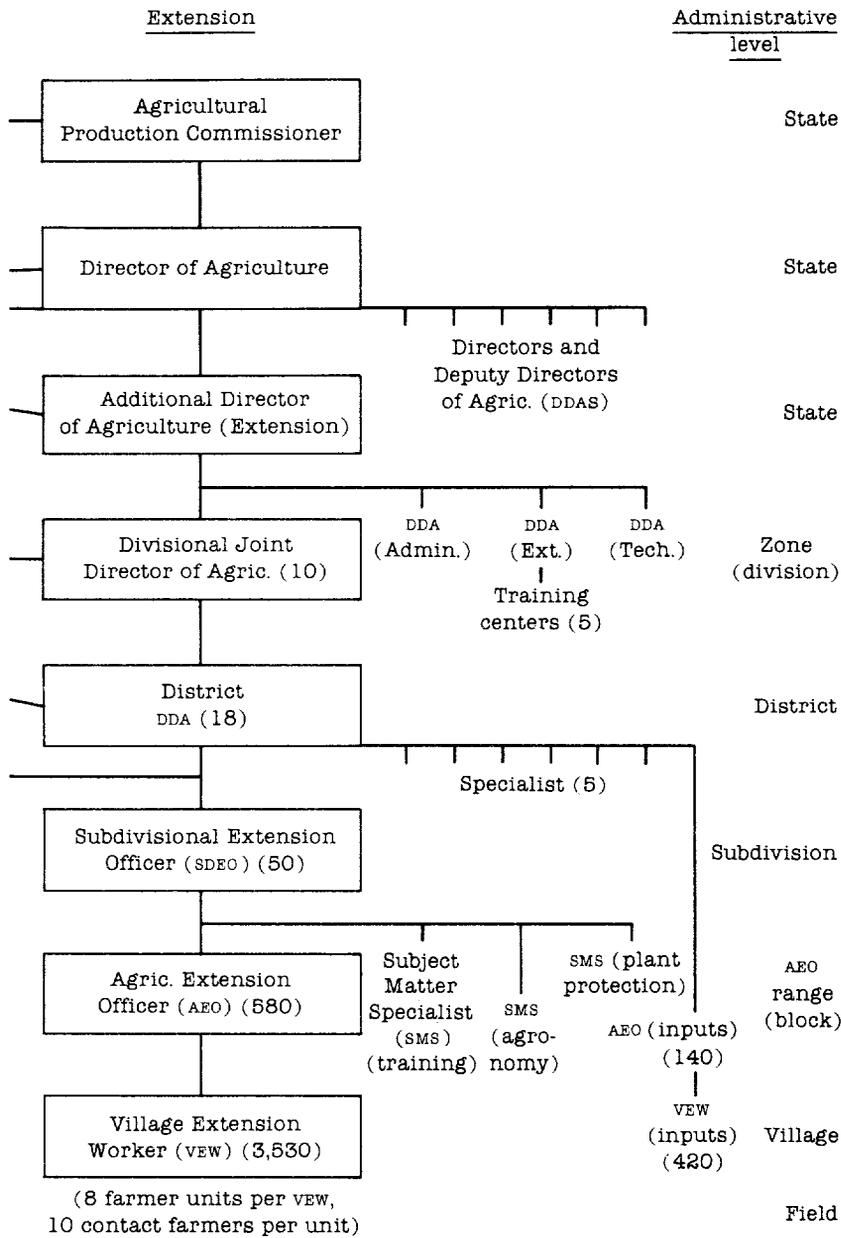
The agroclimatic conditions and the farmers' own requirements determine the major crops that are grown in a particular region. It takes years of experience for farmers to

Table 4-2. Paddy Yields in the Chambal Project Area, Rajasthan and Madhya Pradesh, India, 1975

Holding size (hectares)	Less than half of extension recommendations adopted (tonnes per hectare)	Over half of extension recommendations adopted (tonnes per hectare)	Difference in yield of farmers following more than half of recommendations (percent)
0-1	2.37	3.92	64.5
1-2	2.63	4.05	54.0
2-4	2.97	3.79	27.6
4-8	3.18	4.39	38.0
8+	2.70	4.16	54.1

Figure 4-1. Organization Chart of Madhya Pradesh Agricultural Extension and Research Project, India





develop a cropping pattern that enables them to fulfill their requirements, which include for most farmers in India self-sufficiency in household consumption needs.

Agricultural extension and research must work together to identify constraints affecting these basic aims of farmers and to do everything possible to increase farmers' production within these local constraints. The task in Madhya Pradesh is complicated by the large number of small, fragmented landholdings, many of which are in locations with unreliable rainfall. The careful identification of constraints to production is important because—as a result of age-old farming experience, low levels of literacy, traditional backgrounds, and risk aversion—many farmers offer resistance to the adoption of scientific advancement. This is especially true of small farmers.

To evaluate constraints to production as a basis for developing suitable agricultural technology, attention must go to:

- The functioning of the present systems of agriculture
- Observations of local technological application in a particular area to help in identifying production opportunities and constraints
- Farmer reaction to innovations
- The infrastructure for input availability and marketing facilities
- The socioeconomic status of the farming community.

In Madhya Pradesh, main constraints to increased agricultural production may be identified as follows. First, operational farm holdings are getting further fragmented with the continuing increase of rural population. Second, the impact of extension on agricultural production has mainly been on larger farmers, who are well-to-do and have the resources to accept new technical recommendations that require monetary expenditure. This problem has been compounded by the fact that agricultural research has been limited mostly to the fields of experimental stations and has been oriented to high-input techniques. Moreover, the particular emphasis of research has been on irrigated areas where a potential for greater production could be readily exploited—although the majority of the cultivated area in India and in Madhya Pradesh is under rainfed conditions. Together, these orientations of research have excluded the small farmer with meager resources from many benefits of technical advances, since research was not focusing on his particular problems and he often could not adopt the advances developed.

A third constraint is that inadequate consideration has been given to appropriate technology for diversified farming conditions based on different cropping systems. The development of appropriate soil and water management technology for various rainfall conditions and different terrains is particularly needed, as is the development of appropriate rainfed production technology in general. Two other significant constraints to increased agricultural production in Madhya Pradesh are the operational efficiency of agricultural implements and the problem of "oral tenants" (tenants without a written agreement), many of whom have little interest in improved methods of agricultural production or in making monetary investments in agriculture.

EFFECTIVENESS OF THE T & V SYSTEM

The T & V system of extension attempts to take care of constraints such as these. Through a series of regular contacts between extension and agricultural research staff in both formal meetings and informal contexts, it attempts to come up with a range of answers suited to specific local production conditions and problems. In particular,

attention is focused on low-cost techniques suited to a wide range of farmers and with a high financial payoff. The production recommendations developed by research and extension should have supremacy over traditional methods and should give greater monetary returns. In short, if traditional agriculture is to be effectively altered, local practices must be adapted with suitable technology from research and must be transferred to farmers quickly (along with supporting incentives and means).

An instance where extension and research must work together is the case of zinc deficiency in northern Madhya Pradesh, where wheat yields have declined even when the full recommended dose of NPK fertilizer is applied and adequate irrigation is given. It has been found that the application of zinc sulphate (usually 25 kilograms per hectare) could correct the situation. Another problem that has been identified but not yet solved is that in western Madhya Pradesh, because of scarce and variable rainfall, farmers sow a mixture (50:50) of sorghum and paddy and are satisfied if they get one of the two crops in a season. Extension and research have to work together on this problem to develop for these farmers simple appropriate technology.

The effectiveness of the new extension system and its support from research can be judged by the spread of soybeans. In Madhya Pradesh during kharif (monsoon), large areas (5 million hectares) of heavy black soils are left fallow because they are non-workable in the rainy season due to moisture saturation. Consequently the cultivator has only one crop—a winter crop. The paradox is that when moisture is available no crop can be raised; crops can be raised only in winter on residual moisture. Research and extension reviewed the problem and came up with the suggestion of a new crop, soybeans. Areas having a rainy season up to the last week of September or even the first week of October can be sown with soybeans, which can be followed by gram or safflower in the winter season. Extension has promulgated this alternative cropping practice among farmers, and the results have been significant.

Only effective extension supported by research could identify these problems and find appropriate answers. This has obviously developed a faith and confidence among the farmers for the new extension system.

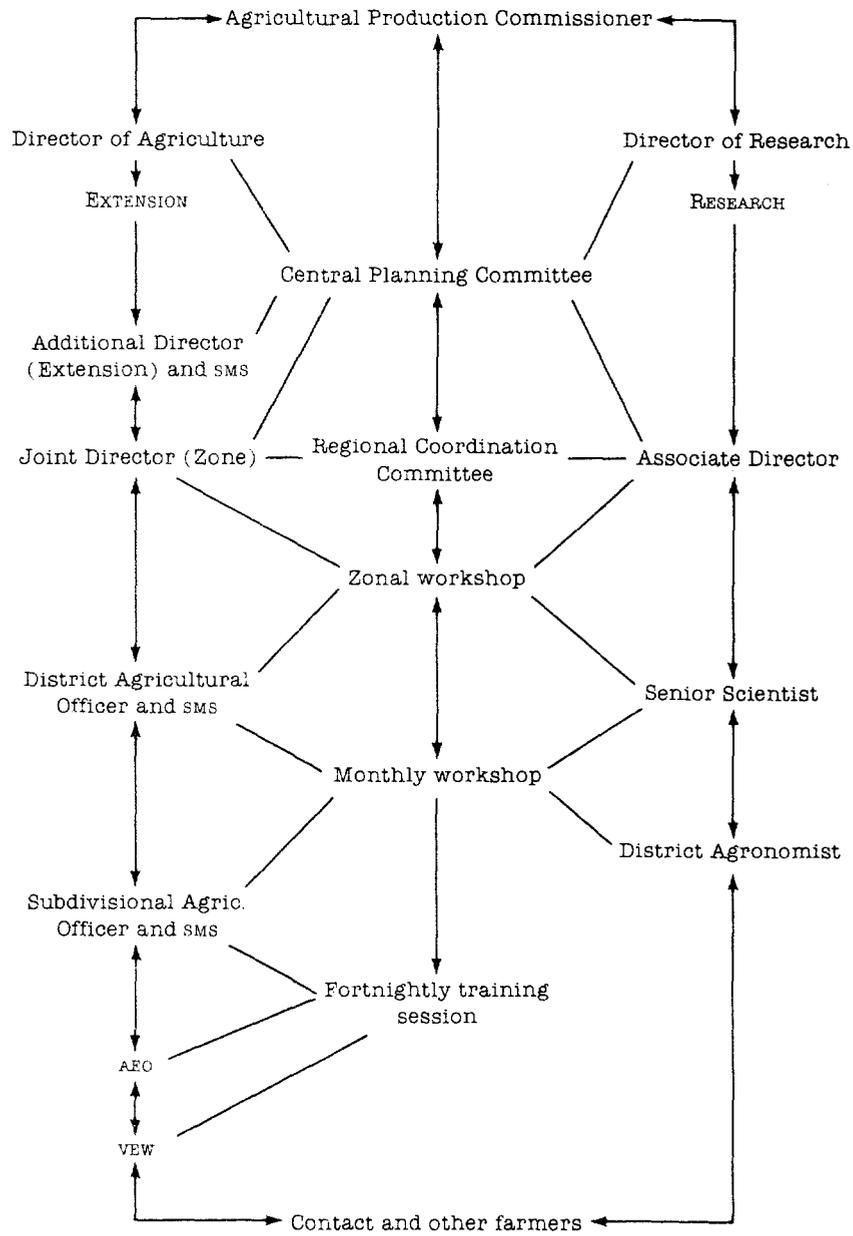
FIXING PRIORITIES FOR THE EXTENSION PROGRAM

After identifying the problems and constraints to production confronting farmers, priorities for the extension service for a season have to be fixed. In setting these priorities, it must be borne in mind that, besides the socioeconomic, agroclimatic, and research constraints, infrastructural constraints can play a predominant role in the acceptance of technology. All farmers will not be able to adopt technologies that require significant investments in inputs such as fertilizers, pesticides, and improved implements. As such, farmers must have technological options that will fit in the varying levels of infrastructural support in the area and will suit their own resources.

The approach of a single recommended package of practices is not useful. Rather, there must be an evaluation of individual steps and various combinations of different steps in technology so that the profitability to cultivators of each, and all together, may be determined. It should also be kept in mind that a small, cryptic quality consideration—like color of a seed grain in wheat, size of seed in sorghum, or aroma in rice—may substantially affect farmers' acceptance of a new technology. Such an approach requires strong extension supported by a dynamic research base.

The T & V system of extension brings research and extension close to each other through various meetings, workshops, and joint visits. Each, however, has to play a specific role of its own. Extension provides the required feedback to research on problems

Figure 4-2. Research-Extension Linkages in Madhya Pradesh



facing farmers. Research provides appropriate solutions to these problems, solutions which will be transferred back to the farmers. There must be periodic meetings of extension and research staff at monthly workshops and at seasonal zonal workshops and technical committees, where technological recommendations and research programs are discussed, modified, and framed to suit local farm conditions. A description of the main extension-research meetings and workshops in Madhya Pradesh follows. The structure of the linkages is shown in figure 4-2.

State Planning Committee

The State Planning Committee (or Central Planning Committee) is chaired by the Director of Agriculture. Participants are senior officers of the state agricultural university, including the Director of Research Services, Director of Extension, Associate Directors, and senior scientists. From extension come District Agronomists, Zonal Joint Directors, District Agricultural Officers, as well as the Additional Director of Agriculture (Extension), who is the Member-Secretary of the Committee. The functional role of the State Planning Committee, which meets twice annually, is to review the programs proposed by the Regional Coordination Committees and then to formulate general recommendations for all major crops in each of the different agroclimatic region of the state. The Committee approves or amends proposed applied and adaptive research training programs.

The State Planning Committee handles only research-extension programs and recommendations. Broader coordination of the necessary support for extension activities is ensured by the State Coordination Committee, which comprises senior officials of the agricultural university and the extension service and the secretaries of concerned government departments such as Finance, Agriculture, Public Works, Irrigation, and Cooperation, as well as the senior administrators of the cooperative Apex Bank, Marketing Federation, Land Development Bank, and so on. This committee, which is chaired by the Agricultural Production Commissioner, meets every three months to review progress of the extension project, especially financial and physical progress and the impact of the reformed extension system. Interdepartmental problems and bottlenecks are discussed and solutions worked out at meetings of this Committee.

Regional Coordination Committee

Regional Coordination Committees are constituted for each agroclimatic zone of Madhya Pradesh under the chairmanship of the Zonal Joint Director of Agriculture. The members of a Regional Coordination Committee are the Associate Director and senior scientists of research establishments in the zone and all District Agricultural Officers and District Agronomists of districts falling in the zone. The major function of a Regional Coordination Committee is to prepare a seasonal program of applied and adaptive research trials and to formulate the broad production recommendations that will be passed on to farmers in the coming season. Particular attention is given to results of previous trials and farmers' responses to earlier recommendations.

Zonal workshops

Zonal workshops are held before each season to work out the specific recommendations for each major crop during the coming season. The three-day workshop is held at a research station or college campus in the zone. Associate Directors of research and senior scientists and the District Agricultural Officers of the zone, together with all the research scientists of various disciplines and extension functionaries to the level of Agricultural

Extension Officer (AEO), participate. Subject Matter Specialists (SMSs) are particularly important participants of these workshops because in many ways they provide, along with District Agronomists, extension's strongest link with research. Because it is the SMSs who teach extension field staff the production recommendations that should be told to farmers, their role is especially crucial in ensuring effective research-extension links.

At zonal workshops, detailed discussions are held on applied and adaptive research findings, and on the experiences of extension functionaries with recommendations of the previous season, before formulating the specific recommendations for each major crop. The recommendations and priorities of the State Planning Committee and the Regional Coordination Committee are important considerations in formulating local programs at zonal workshops.

Monthly workshops

Two-day monthly workshops are held in each district at either a research station or a seed farm of the Agriculture Department. Monthly workshops are attended by the research scientists of the area, the District Agricultural Officer, and the SMSs and Subdivisional Agricultural Officers of the district. Recommendations of the zonal workshop as they apply to the local area are reviewed. Seasonal conditions are discussed and the recommendations for the month are formulated accordingly. These workshops are an important forum for developing close links between the field workers and researchers. It is here that researchers, as trainers, are apprised of farmer reaction to recommendations and farm problems in general and are encouraged to visit the field with SMSs to review in the field actual production conditions and constraints.

Fortnightly training

Fortnightly training sessions are held regularly at the block (or AEO) level. They are used to refine further and make adjustments in the production recommendations in the face of local conditions and seasonal changes, including the outbreak of pests or plant diseases. Fortnightly training sessions are attended by all the VEWs and AEOs of the area, and also by representatives of local input agencies. SMSs, who have attended monthly workshops, are the trainers and are helped by the Subdivisional Agricultural Officers and District Agronomists.

ADAPTIVE RESEARCH AND FORMULATION OF RECOMMENDATIONS

It is a well-known fact that technology developed for transferral to the ultimate beneficiaries, the farmers, must be tested for suitability under the actual farming systems of the farmers of different agroclimatic regions. Madhya Pradesh has a wide range of soil and climatic conditions, but a basic consideration is that 87 percent of the cultivated area is under rainfed farming. Hence, an emphasis of research and extension has to be rainfed farming and the technology suitable for it.

The T & V system of extension has attempted to take care of this aspect. Findings and technology coming from research and the joint research-extension committees are first tested in applied trials in different agroclimatic zones under the direct control of research scientists. A second step is to evaluate the effectiveness of the applied trials through a series of adaptive and on-farm trials. These trials are laid out on farmers' fields with the guidance of the District Agronomist and are conducted by the SMSs working in the district.

Only after evaluating the performance of new recommended technology through farm trials is the technology recommended to farmers by extension workers.

The production recommendations that extension workers will pass on to farmers are prepared in three stages. First, data of adaptive research and farm trials are analyzed statistically to indicate the varieties suited for a particular area and, similarly, the methods best suited for sowing and so on. On the basis of significant trial results, recommendations are formulated at zonal workshops. Since it is not practically possible to carry out research in every area, research results must be interpolated, and recommendations for each area are based on analogy to similar areas for which data are available. Second, the general recommendations developed at zonal workshops are discussed at the monthly workshops held in each district. After a thorough evaluation, which includes their economic efficacy, the general recommendations are included in the recommendations for specific areas and specific crops. They are then passed on to fortnightly training sessions for discussion and teaching to extension field staff. Third, new practices are promoted by VEWs among contact farmers and innovative cultivators. The experience of these farmers is used to evaluate the practicability and suitability of the recommendations for farmers at large. Farmers' reactions to recommendations are especially considered. This evaluation of recommendations takes place in the field by VEWs, AEOs, SMSs, and other extension staff, as well as in fortnightly training sessions, monthly workshops, and the seasonal extension-research meetings. From season to season, recommendations are adjusted or reemphasized in light of farmers' experience with them and new research findings and resource situations. It is necessary to ensure that recommended practices given to farmers make economic sense for them; changing prices of inputs and agricultural produce make continual reevaluation imperative.

ADJUSTMENT OF RECOMMENDATIONS

Reformulation and adjustment of production recommendations within a season has to be done when normal climatic conditions do not prevail. For example, high temperatures prevailing beyond the usual dates may compel cultivators to shift the dates for sowing of winter-season crops. Similarly, a delayed monsoon forces postponing the sowing of rainy-season crops. These conditions are not unusual for any country, nor are they predictable. The monthly workshops and fortnightly training sessions must give extension and research staff the training and opportunity to adjust recommendations to suit prevailing conditions in the area in which they are to advise farmers.

Weather fluctuations in Madhya Pradesh frequently call for readjustment of recommendations for the type of crop or the variety to be sown. Some of these adjustments are relatively routine and are normally built into the extension planning and training cycle. In case of delayed monsoon, extension workers start recommending short-duration varieties of crops like rice, sorghum, or millet. Unduly delayed rains compel the farmers to choose crops like green gram or toria (rape, Brassica napus) which can mature in sixty to seventy days. In the event of excessive rains, the problem of improving the drainage arises. The farmers are advised of measures for disposing of the excess water that lies in their fields. Other adjustments must be made for emergency situations. Needless to say, the control measures to curb pests or diseases are often more in demand by farmers than recommendations for the top dressing of crops with fertilizers.

Adjustment of recommendations is particularly likely to be needed in rainfed areas. Since all but 13 percent of the area of Madhya Pradesh is rainfed, the ability to adjust recommendations is important. Farmers have to make amendments in their farming

programs depending upon the nature of the contingency. Extension must help them by suggesting practices that will enhance their productivity under such circumstances. For example, the western part of Madhya Pradesh is predominantly a sorghum area. However, late showers compel the farmer to choose short-duration varieties of sorghum or even a pulse crop. Similarly, the area under cotton decreases in the event of late rains. Extension must be able to recommend sorghum, pulse, and even cotton varieties suited to late planting.

Another example is that, because sorghum is not as remunerative as soybeans, cultivators in the central zone prefer to plant the latter by diverting a part of their area normally under sorghum. (The support price of soybeans has worked as a great incentive to the farmer.) To start with, farmers even preferred the local black variety of soybean, but long-duration black varieties could not withstand the dry spell; hence, under extension's advice farmers quickly shifted to early-maturing yellow varieties. A price incentive for yellow varieties also resulted in fast coverage in comparison with black varieties. A final example of extension's assistance to farmers to help them adjust to short-term contingencies comes from the experience with cotton. When recommended variety Khandwa-1 was heavily attacked by topshoot borer, farmers were advised to go for other varieties, like Khandwa-2 and A51-9, that are less susceptible to this pest.

Changes in market conditions significantly affect the area under particular crops. Farmers react immediately to changes in price. In Madhya Pradesh, both soybean and cotton production have recently increased dramatically in response to market conditions.

In some areas, extension and research have not yet come up with the right recommendation to influence farmers. In rice-growing areas of Chhatisgarh tract of Madhya Pradesh, cultivators are giving much resistance to groundnut as a replacement crop for summer paddy. Efforts to encourage the replacement have failed to produce substantial results. Similarly, all efforts have failed to replace the pulse Lathyrus sativa, which grows well under dry conditions but has a toxic effect that can be injurious to health. Even when the cultivators were offered an alternative crop like gram, lentil, or safflower, they did not respond. In tribal areas of Madhya Pradesh, farmers offer much resistance to white-grained maize varieties, despite yield potential higher than that of yellow varieties, because of their food preference for yellow maize.

Thus, farmer-felt needs, soil fertility status, market situations, or even the resistance of farmers to adopting a particular seed variety have to be given due consideration in proposing a modified or amended recommendation to satisfy local needs. This necessary adjustment between and within seasons can only be done through a well-organized extension service with effective feedback from the field. Under extension's guidance, research has to find the variety suitable for each area and production conditions, one which should not only improve the production and increase the incomes of farmers but should at the same time be preferred by the cultivators.

The T & V system, through its methodology of regular visits, affords a strong motivation to the farmers for adopting such innovations.

ORGANIZING LINKAGES FOR EFFECTIVE CONTACT BETWEEN FARMERS, EXTENSION, AND RESEARCH

Linkages between extension and research are developed through the various technical committees and workshops that meet seasonally and monthly. It is still necessary, however, for a deliberate effort to be made so that the problems of the farmers are taken to

research by extension functionaries. For this, visits to the field by extension staff have to be regular, and they should be backed by regular training. It is through this training that relevant technology will flow from research to extension and then to farmers. But the training will be relevant to farmers', and hence extension's, needs only if there is continuous feedback from farmers to extension workers and from extension workers to research.

Before the introduction of T & V extension, agricultural research was largely confined to seeking solutions for general, basic problems rather than solutions for the specific field problems of farmers of a particular area. Research has to be oriented to the key constraints faced by farmers. It is desirable that research should come closer to the farmers' fields to develop solutions befitting local situations and to suggest ways of motivating farmers to adopt them.

As well as establishing committees and informal forums where extension and research can discuss farm problems, in Madhya Pradesh it has proven necessary to restructure research for it to be able to work more effectively on actual farmers' priorities. In Madhya Pradesh, research stations and substations have been established on the basis of five identified major agroclimatic zones and nineteen subzones (see table 4-3). In addition to the reorganization of research station locations, the post of District Agronomist was created to ensure better feedback between extension and research.

Although the reorientation of research to actual farmer needs and the feedback of farmers' experience to both extension and research is made possible with the T & V system, other actions are needed to make research and extension contribute even further to the dissemination of technology. The main requirement is that the involvement of cultivators will have to be increased. For this, the following steps can be considered:

Table 4-3. Agroclimatic Zones and Zonal and Regional Research Centers in Madhya Pradesh

Zone	Regional center	Subregional center	District covered
1. Rice	Raipur	1. Raipur 2. Balaghat 3. Bilaspur 4. Jagdalpur 5. Ambikapur 6. Dindori	Raipur, Durg, Rajnandgaon Balaghat Bilaspur, Raigarh Bastar Surguja, Shahdol Mandla
2. Rice-Wheat	Jabalpur	7. Jabalpur 8. Rewa	Jabalpur, Seoni Rewa, Satna, Sidhi, Panna
3. Wheat	Powarkheda	9. Powarkheda 10. Sehore 11. Sagar	Hoshangabad, Narsinghpur Sehore, Bhopal, Vidisha, Raisen Sagar, Damoh
4. Cotton-Jowar	Indore	12. Indore 13. Mandsaur 14. Jhabua 15. Khandwa 16. Khargone	Indore, Dhar, Dewas, Ujjain Mandsaur, Ratlam, Shajapur, Rajgarh Jhabua Khandwa Khargone
5. Jowar-Wheat	Gwalior	17. Gwalior 18. Tikamgarh 19. Chhindwara	Gwalior, Bhind, Morena, Shivpuri, Guna Tikamgarh, Chhatarpur, Datia Chhindwara

- Short-term exchange of farmers between areas to provoke exchange of ideas and to help in the acceptance of innovations
- Organizing farmers' fairs
- Visits to research stations by farmers
- Training camps for young farmers to hasten the process of change (for this, institutions like the Farmers' Youth Clubs may be useful).

To sum up, to achieve the necessary increased agricultural production a dynamic agricultural extension service is needed—one which is fully supported by relevant training programs, strong linkages with research, and active farmer participation in both the formulation of recommendations and the dissemination of innovations. The T & V system of agricultural extension is a definite improvement over the past system of agricultural extension and provides the framework for these necessary developments.

5

The Interdependence of Research and Extension: A Comment

John K. Coulter

Just as design engineers and marketing managers tend to blame each other for the failure of their bright new package, so do agricultural researchers and extension workers find in each other a convenient alibi if the farmers ignore their message. Farmers are portrayed as perverse, conservative, or very smart depending on how they react. However, just as the marketing manager needs the design engineer to produce a gadget that the public needs (or can be persuaded to think it needs), so does the extension agent need the researcher to design the package that the farmer needs. Indeed, the researcher may be smart enough, on occasion, to design a package that sells itself and needs no advertising or face-to-face encounters with farmers. This, however, is probably the exception, and in most cases the two systems—research and extension—must interact closely to make discernible impacts on production.

To reach this desirable situation the research system must generate technical recommendations, and the two systems must develop linkages at both the personal and institutional level: institutional so that they are mutually supportive; personal so that they understand each other's problems. Such understanding is particularly necessary in the poorer countries and for the poorer farmers, where circumstances often demand simple, low-cost solutions to the problems but where such solutions are by no means either easy or quick to obtain. Indeed, high-quality research is usually essential for the solution of problems which are often complicated and difficult. Where solutions are simple, farmers often find them themselves.

IMPROVED TECHNOLOGY AS A COMPONENT OF AN EXTENSION SYSTEM

There are obviously several essential components needed for the operation of a successful extension system. One of these is a technical recommendation that the farmer is capable of implementing and that is to his benefit. Such technical packages emanate from two sources—experience of the more progressive and imaginative farmers and research—with the latter done either in the area concerned or elsewhere.

Successful research depends on:

- Identifying the important problems
- Formulating these in such a way that they are susceptible to research
- Developing successful solutions.

Identifying important problems

The papers at the Chiang Mai Workshop indicate that researchers often fail to identify the important problems. Mehta's paper (chapter 4) describes the economic and physical

constraints that the farmers of Madhya Pradesh, India, face; these include small, fragmented holdings, low levels of literacy, and risk aversion in conditions of poor rainfall. If the researchers do not take these conditions into account, then the farmers are likely to ignore, or at best partially adopt, the recommendations.

The Training and Visit (T & V) extension agents and Subject Matter Specialists (SMSs) thus play a very important role in identifying farmers' problems and in making the research workers aware of them. The system provides a formal mechanism in the monthly meetings, where researchers and extension workers can discuss the farmers' technical problems.

In Mehta's paper and in the other papers presented at the meeting, it is emphasized that the SMS has an important role in the identification of problems, and in the T & V system his role has been portrayed as a pivotal one. He has a major role in translating the findings of the research workers into a message that fits the social, economic, and physical environment of the farmers of his area. Another major function is that of diagnostician and problem solver, either directly with the farmer or through the extension agent. A third function is that of collaborating with the research worker in identifying researchable problems and assisting in the research programs set up for their solution. This is a formidable burden for a man who may have little training in research and little experience in organizing research programs. This is not to argue against the role for the good extension worker and the good SMS in helping the researcher identify the important problems of the farmers. It is mainly to suggest that such identification depends on more than routine contacts at monthly meetings.

The monthly meetings provide a formal mechanism where researchers and extension workers can discuss the farmers' technical problems. However, this mechanism can be counterproductive if it leads to frequent changes in research programs. Indeed, it is necessary to make a distinction between the use of feedback to reformulate extension messages and feedback to reorient research programs. Also, it is worth emphasizing that the objective of a research team is to deal not only with the immediate problems facing the farmers but also with the problems that are likely to face them in the next decade. Thus, the immediate problems should not be allowed to dominate research planning to the exclusion of longer-term research.

Formulating researchable problems

Much discussion about research fails to recognize the limitations of research. Mehta's paper illustrates this well by pointing out that particular emphasis has been given to research on irrigated areas, whereas much of the cultivated area in India and in Madhya Pradesh is under rainfed conditions that require new soil and water management technology. In the papers for this conference the importance of rainfed farming, especially to the poorer sections of the population, the lack of good technology, and the slowness in improving productivity are recurrent themes. One can but agree that much needs to be done, but the difficulties have to be recognized. Study of irrigated agriculture deals with a series of relatively simple research problems with a high probability of successful solution and a likelihood of a large impact on production. Problems in rainfed agriculture are generally more difficult, the likely outcomes are more uncertain, and the impact on production is likely to be less. Furthermore, research cannot be expected to solve social and economic problems. At best it offers a series of alternatives of a technical nature which can be incorporated in more productive agricultural systems. If the limitations to biological research are not recognized, the essential institutional reforms—such as the provision of inputs and the improved management of water—may be delayed indefinitely.

Developing successful solutions

There are several different aspects of the research process as it is used in agriculture. Titles such as "basic research," "applied research," and "adaptive research" are applied with differing and often confusing perceptions. The term basic research is usually applied to areas of fundamental science designed to produce new knowledge. Unfortunately, the term appears to be applied to research which, in the agricultural context, has no practical aim in view. All too often this means that it is of no conceivable value. Applied research, the application of existing knowledge to generate new technology, is the backbone of agricultural research. Improved crop varieties, methods of controlling pests and diseases, and better ways of moisture control are the sorts of objectives encompassed by this kind of research. It follows, then, that this should be the major effort of the well-equipped research station, but in many countries there will be only one or a few stations equipped to do this properly.

The term adaptive research is used to cover a wide variety of activities, although the adjective "simple" seems a frequent modifier of the term. There are two aspects to adaptive research. The first is the use of experimental techniques to select a technology that will fit a particular zone or niche in the farming system. The second function is to determine whether particular technologies are likely to be profitable to the farmers of the area concerned. In other words, is the technology profitable under the farmers' own conditions? It should also be emphasized that adaptive research can only be done where there are some technologies to adapt and cannot substitute for good applied research. Some adaptive research can be done on research stations, provided that these are situated in the proper ecological zones, and some must be done on farmers' fields (for example, those designed to test profitably for the farmer).

Unhappily, adaptive research appears to be used often to connote work of lower quality or less demanding intellectual skills. This is most unfortunate, for such research requires not only training in research and a sound intellectual capacity but also a sound knowledge of both the biological and economic aspects of agricultural production.

One major implication of this discussion on the role of adaptive research is the timing of such research. In some T & V projects it is admitted that little or no proven technology exists, but that by insertion of an adaptive research component such technology will be generated during the course of the project. At best this is wishful thinking. More often it forces the project into a false sense of security, for the chances are slender indeed that anything of proven value will emerge during the first three or four years of an adaptive research project, particularly if there is a lack of technology to adapt. This emphasizes the need, at the start of an extension program, for a thorough appraisal of the technologies that are available, their likely impact under farmers' conditions, the time it would take to adapt them to the farmers' conditions, and the quality and availability of research staff needed to do the work.

RESEARCH-EXTENSION LINKAGES

The output of a research system is new knowledge and new technology. It is the application of that new knowledge and new technology which brings about the impact on production, such that there is no impact unless the technology is applied by farmers. To apply it, farmers need to know about it and to know how to use it. While there is abundant evidence of the spread of new technology without the intervention of extension services, the need for a formalized system of knowledge transfer is at the heart of the T & V system.

Thus, the Village Extension Worker (VEW) needs to know not only about new technology but about how to advise farmers to use it. The VEW needs to be supported by the researcher or the SMS when offering advice on the more difficult technical problems. He needs a flow of new technology for passing on to the farmer, and he needs opportunities to advise the researcher of the important problems farmers face.

Linkages between research and extension exist at both the formal and informal level, and the discussions in the papers seem to indicate that both are often weak. Formal links are often weak because of institutional divisions; research and extension may be in different ministries or in widely separated departments of the same ministry. Little attention may be given to organizing formal contacts such as field days at experiment stations or joint meetings of research and extension workers. However, it is not clear how the lack of formal linkages influences the formation of informal links. For example, do extension staff lack contact with research staff because there are very few opportunities to confer, since many of the research staff live and work in major cities? In such cases even the best-developed formal linkage will be of little use in encouraging interaction. Sometimes it is suggested that there is a "cultural" gap between research and extension staff because the former are more highly qualified and better paid and thus more respected. Certainly there is plenty of evidence to suggest that extension staff are poorly paid and have poor career prospects compared with research staff. As described by Mehta, the T & V system brings research and extension staff together at regular intervals. These meetings should help to dispel some of the misunderstandings and to encourage discussions on topics of mutual interest. Obviously such meetings could be organized by a research service as easily as by the T & V staff, and indeed it is difficult to understand why they do not take place even in the absence of a T & V system. Is there a factor of coercion that leads to these meetings? If so, it is not likely to lead to much productive cooperation.

CONCLUSIONS

Mehta's paper, and indeed all of the papers for the meeting, notes that improved technology is one of the essential components of an effective extension system. A critical assessment of what is available, and its likely value to the farmers, is thus a crucial part of the ex ante assessment of the potential impact of an extension system and, hence, the rate of return to the investment. Where such technology is not available, overoptimistic expectations of what can be generated by adaptive research during the course of a project can be counterproductive, as can the expectations about the benefits of research in rainfed farming systems. The expectations of simple, low-cost solutions to the problems of farming in the more difficult agroclimatic zones will be unfulfilled unless more realistic assessments of the problems are made.

Training

6

Training in the Training and Visit System: Experience in Sri Lanka

S. Natesan

Research and training support are vital to extension. These activities contribute to raising the competence and effectiveness of the extension personnel. Realizing the importance of this type of support, the government of Sri Lanka initiated in the early 1970s a scheme for the reorganization and strengthening of research, extension, and training resources in agriculture. The reorganization led to the decentralization of research on the basis of agroecological regions; the strengthening of the training services with responsibility for developing strong preservice, in-service, and vocational training; and the strengthening of the extension service.

Some progress was made, but the basic problems of inadequate staffing and coverage by extension and insufficient technical support and supervision persisted, although to a lesser degree. Meanwhile, the need to resolve these shortcomings assumed greater urgency with the strong commitment on the part of the government to achieve self-sufficiency in the major food commodities.

In 1979, the government decided, with financial assistance from the World Bank, to strengthen these activities further under a new project entitled "The Agricultural Extension and Adaptive Research Project." The aims of the project included:

- The strengthening and reorganizing of extension activities by the establishment of the Training and Visit (T & V) extension system
- The strengthening and reorganizing of agricultural research by the establishment of an adaptive research network on the basis of the country's eight agroecological regions
- The improvement and expansion of the training in agriculture to meet the requirement of the T & V system.

There is evidence of increased productivity within the past three to four years. The average yields of paddy, for instance, have increased from 131.79 bushels (1 bushel = 20.5 kilograms) to 144.22 bushels per hectare, and the total production has increased from 91.8 to 106.8 million bushels during this period. One of the factors contributing to this increased production is the large-scale adoption of improved technology by farmers as a result of the new system of extension. This achievement is even more noteworthy considering that a severe drought affected part of the country in 1981.

DEVELOPMENT IN TRAINING

The introduction of the T & V system on a pilot basis in one administrative district in 1978, and thereafter in two other selected districts, gave encouraging results that led to the application of the system on a countrywide basis (twenty-four districts) in 1980.

Concurrently, and to provide adequate support for the new system, research was decentralized by strengthening the eight Regional Research Centers (RRCs; in Kilinochchi, Maha Iluppallama, Katugampola, Karadiyanaru, Gannoruwa, Bombuwela, Bandara-wela, and Angunakolapelessa) and additional substations and by setting up adaptive research units to test research findings on farmers' fields.

With the introduction of the T & V system, the regular and systematic training for extension staff at all levels assumes greater importance. To cope with this need, and to establish close linkages between research, extension, and training, the Regional Training Centers (RTCs) were strengthened. These centers are located in each of the agroecological regions in close proximity to the RRCs, virtually on the same campuses. Six RTCs are now functional, and two more will be established during the next two years. By this institutional arrangement, the extension staff of a region are now able to attend short-duration (usually one week) in-service training courses to suit their needs and to have the opportunity of meeting with the research specialists, of learning about new developments, and of discussing their field problems. This close interaction has made the research personnel increasingly aware of field problems and has led to a stronger emphasis on solving farmer-oriented problems.

Training in the T & V system is not entirely a matter of training only the extension staff. It was realized that, for the acceptance of the system, there was a need to create an awareness and understanding of the system not only in the minds of the extension staff but also among several other groups—research personnel, administrators, university teachers, local officials, mass media personnel, T & V administrators, services supporting extension, and particularly the farmers. This paper will therefore focus attention on five major aspects:

- Creating awareness and understanding of the system
- Training of field workers
- Training of Subject Matter Officers (SMOs)
- Training of information and communication staff
- Training of those responsible in T & V administration and services supporting extension.

Some of the problems encountered and approaches adopted to resolve the issues are also discussed.

Creating awareness and understanding of the system

Before the spread of the T & V system throughout the country, highest priority was given to creating an understanding of this system among extension and other staff. Workshops were organized to explain the concepts, philosophy, and operation of this system to senior and middle-level staff in extension, research, and training divisions. Senior staff from the Extension Division conducted these programs, which included field visits to enable the participants to observe the system in operation. These workshops were followed by a further round of training of the rest of the field staff, including the Village-level Workers (VLWs; Village Extension Workers, VEWs, in Sri Lanka) within the districts.

Difficulties were expressed about adherence to the scheduled visits on account of certain activities—meetings, competitions, and exhibitions—that were organized by local administrators and politicians. This was resolved to a large extent by discussions, and these have now been reduced to a minimum and have been scheduled, as far as possible, on days when the field staff are not on scheduled visits. In the early stages, the new system was

also perceived mainly as a way of communicating messages to selected farmers. This misconception, too, has been cleared up through training and by insisting that each VLW establish a certain number of demonstrations, based on "stress points" (or "impact points"), in contact farmers' fields and on his organizing field days and group meetings in as many locations as possible, and involving as many farmers as possible, during a season.

Following the introductory phase, the operational phase had to be constantly reviewed to see whether visits were regular on scheduled days; whether the training was adequate, particularly with regard to skills development; whether adequate numbers of farmers were being met; and so on. Officers in the districts needed continuous guidance during operations. Frequent visits by teams of specialists and members of the Directorate (Director of Agriculture; Deputy Directors, Extension, Training, and Research; Additional Deputy Directors) to districts have helped a great deal in identifying and resolving many of these operational difficulties.

Creating awareness and understanding among farmers was itself considered essential at the outset. Groups of farmers were convened by VLWs, who explained the scheme to them. These groups also served to identify their representatives (contact farmers). Large printed notices indicating the name of the VLW and days of visit were displayed at prominent locations. The rural farm radio broadcasts (see subsection on training of information and communication staff, below) carried information concerning the new system. However, much still remains to be done.

Some of the new approaches now being adopted include the organization of more field days and farmer meetings by each VLW, ensuring that the VLW meets some new farmers during his visits; orientation about the T & V system for more and more of the local officials; better supervision to check on awareness among farmers, treating this as a stress point at fortnightly training sessions; and, wherever part-time farmers exist, visits at a time convenient to them. A tape-slide set has also been produced and distributed to all districts for orientation programs.

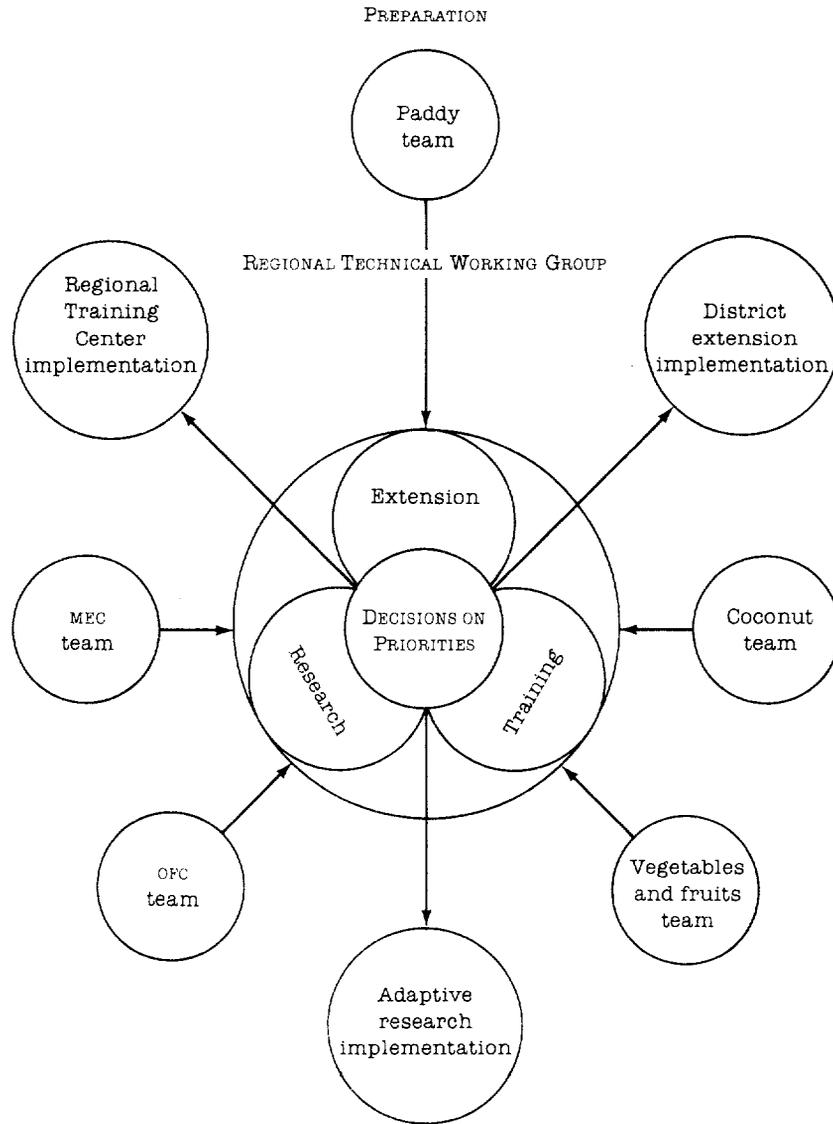
Creating an awareness among local officials has also received attention. Grama Sevakas (village-level administrative officers), Cultivation Officers, and Agricultural Instructors (AIs) are sent for short-duration training courses in agriculture by their respective departments. They receive a short training session at the District Training Centers (DTCs), and information about the T & V system forms a part of these courses. Similarly, all new recruits to the Sri Lanka Administrative Service now receive on recruitment a week's training in agricultural policies and programs. The T & V system is explained to them as well, since this information would be beneficial in the long run when they become administrators and decisionmakers.

One thing has become clear: whether it be for farmers, officials, or field staff, continuous reinforcement about the details of the T & V system is absolutely essential. Training has to meet these needs on a continuing basis.

Training of field workers

Of all the training activities, the training of field workers is the most critical one. Our main concern is to build the professional competence of the staff. Basically, all levels of field staff require a regular and systematic training in subject matter that is relevant, profitable and timely. In addition, different groups require further training: for instance, SMOs require more in-depth training in their subjects; supervisory staff require training in supervision and management; and so on. All levels, of course, require a good understanding of the T & V system.

Figure 6-1. Flow Chart for the Planning and Preparation of Extension Information Packages, Adaptive Research, and Training Programs in Sri Lanka



MEC = Minor export crops (coffee, cocoa, pepper, and the like).
 OPC = Other field crops (coarse grains, pulses, oilseeds, and the like).

To be effective, these training activities should be based on identified needs. Courses should be formulated to meet these needs and thereafter implemented and evaluated for their effectiveness. The training model developed in Sri Lanka has proved to be effective under local conditions. In each of the eight agroecological regions, as explained earlier, there is an RRC and an RTC. These are linked with extension by the Regional Technical Working Group (RTWG), which includes the staff of the RRC (Deputy Director, Research, and the research staff, including adaptive research personnel), staff of the RTC (Assistant Director [AD], Training, and the Subject Matter Specialists [SMSs]) and the senior extension staff of the region (ADs, segment Agricultural Officers [AOs], and SMOs).¹

About four months prior to the commencement of each season, the RTWG has its meeting. The Deputy Director, Research, of the RRC functions as chairman and the AD, Training, of the RTC as convener. This meeting lasts one to two days. The agenda for the first day includes a review of the past season's performance and a presentation of problems faced by extension and farmers, the research results, and training activities. The second day is devoted to identifying and formulating the stress points and targets for the extension, and the adaptive research and training programs for the ensuing season on a priority basis. A flow chart describing these activities is shown in figure 6-1.

Once these training needs are identified, the task of the RTC is to formulate the preseasonal training programs for all levels of field staff (AO, SMO, AI, and VLW). The AOs and SMOs are trained by the research personnel, and the remaining categories are trained thereafter by the SMO and the staff of the RTCs. To make these training activities more field-oriented, the RTC has its own field facilities where the stress points are demonstrated in practice and the trainees have the opportunity to practice the skills themselves.

While the preseasonal training looks after the stress points for the season, our experience has shown that additional training is required to make the VLWs, AIs, and SMOs more competent and confident. They require further training in subject matter as well as in extension methodology. These training needs are identified during the season by the supervisory officers (AOs, ADs, and headquarters personnel) and visiting SMOs from the RTC. These training needs are then translated into short-duration training courses (mostly one week or less) at RTCs using specialist officers from extension, research, and training divisions and, at times, staff from other agencies. These courses have now been systemized, with the first and third quarters of the year devoted to preseasonal training and the rest of the year to special courses to meet supplementary needs. Attendance at these courses has also been made compulsory.

In formulating and conducting such training programs, more emphasis is given to practical training for skills development. Separate programs are formulated for different levels of staff, with VLWs receiving more emphasis on field practice. Since the RTCs have adequate field facilities, this presents no problem.

Very often evaluation is formal. Short practical tests at the end of courses are used to assess whether the trainees have improved in knowledge and skills. We place greater emphasis on informal evaluation through visits by trainers and headquarters officials and discussions with field staff and through attendance at fortnightly training courses and field days.

Besides the preseasonal and special training conducted at the RTC, there is the monthly research-extension dialogue in which AOs and SMOs visit the research stations and discuss field problems. This has been identified as a training need. Our experience has shown that visits and discussions in the field are more beneficial during these monthly dialogues than meeting at the research station, and that there should be a final meeting

1. In Sri Lanka the SMS operates at the regional level, the SMO at the district level.

at the end of the day with all SMOs and research personnel to sum up the day's observations.

The fortnightly training programs take place in the districts, and the SMOs train the AIs and VLWs. The objective of the training is to equip the officers with the necessary information relevant to the fortnight's farming activities and is based on the cultivation calendar. To improve communication skills, we have been conducting training programs in communication and in the preparation and use of communication materials. The trainers from the RTCs visit and participate at some of these sessions to get feedback on the quality of this training, to learn of any distortion of messages, and to identify the deficiencies for future training. A discussion of the T & V system in operation is now a feature of the fortnightly training program.

Training of Subject Matter Officers

The T & V system operates on the basis of regular training of SMOs, who in turn train the AIs and VLWs. The quality of the SMO is therefore crucial to the success of the scheme. Obviously the SMO needs good preservice training followed by induction training and in-depth training in his subject matter.

In Sri Lanka the SMO is usually a senior experienced AI with an interest in a special field. On selection as SMO, he receives an initial training of one to two months' duration in his specialized field (rice, production of other field crops, horticulture, plant protection, or extension methodology) at the RTC. These are specialized courses organized for new SMOs with the assistance of research officers, SMSs, and senior extension personnel. The curriculum includes theory, field practice, some laboratory exercises where necessary, and a field project. Extension methodology also forms a part, so that the SMO in turn can train others in how to organize and conduct meetings, field days, fortnightly training programs, and so on.

Thereafter, while on the job, the SMO receives further training preseasonally and monthly at the RTC and RRC. A few SMOs also receive training abroad at international research institutes and universities.

There is a need for regular and constant updating and improving of the SMO's professional competence. For this purpose, we also organize special in-country training courses, sometimes with assistance from foreign development agencies. Last year, for instance, two courses—on pest and disease surveillance and management and on preparation and use of communication materials—were conducted in Sri Lanka. In some instances, short training courses are conducted at field locations by specialists. Translation and publication in local languages have also been found to be helpful.

Training of information and communication staff and establishing linkage with broadcasting personnel

The Department of Agriculture has a Farm Broadcasting Unit staffed by agricultural personnel who have received some training in preparing and conducting programs for radio. The programs were too general in nature in the past because there was only one broadcasting station. With the opening of regional stations, there is now scope for production of programs that are more relevant and timely for local farmers.

With the introduction of the T & V system, the possibilities of closer linkage with the broadcasting unit were explored, and steps have been taken in this regard. Broadcasting staff now participate in the RTWG meetings referred to earlier and thereby become familiar with the new developments, extension messages, and priorities within the region.

They also use the opportunity to record interviews with research and extension personnel.

The cropping calendar and subject matter programs that are being prepared by SMOs are made available to the broadcasting unit. This helps the broadcasting personnel to record in advance and, as far as possible, broadcast timely messages to farmers, with emphasis on stress points.

An innovation that is being put into effect is to have one SMS at the RTC trained in broadcasting techniques. His duties will be to prepare scripts for the radio using new information, to record talks and interviews with visiting trainees and scientists, and to send these to the broadcasting unit regularly.

A further link has been established by the appointment of a Training and Communication Officer in each district. His duties include the training of field staff in how to organize and conduct meetings, field days, and workshops; to design curricula for training programs; to assist in preparation of simple communication materials; to train the field staff in the use of such materials; to attend some of the fortnightly training programs and suggest measures for improvements in quality; and to communicate information about the farmers' innovations to the radio stations and the quarterly journals.

Training those responsible for T & V administration and services supporting extension

The local AD in a district is responsible for T & V administration and for coordination with other departments and agencies that are responsible for input supplies, credit, marketing, and so on. Usually the AD has several years' experience in extension, but he requires further skills in management and supervision. In recent years, we conducted special courses in management with the assistance of specialists from abroad as well as from within the country. This is a weak area, and we have yet to identify suitably structured short courses that would meet this need.

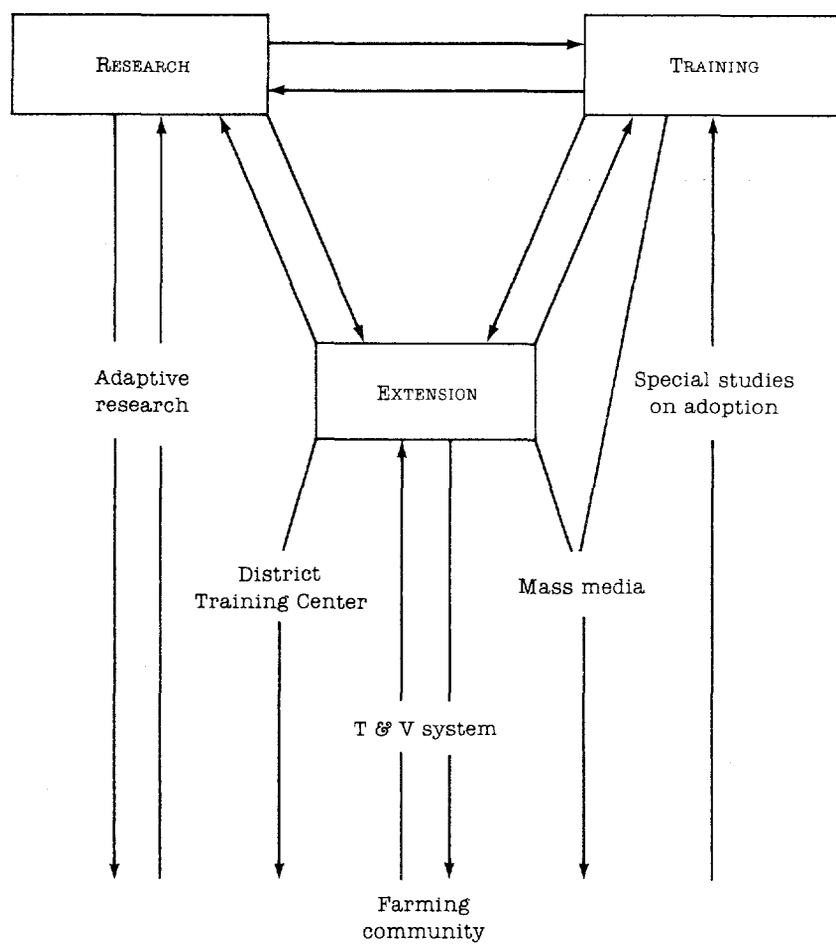
The success of the new extension system also depends on the support given by many other agencies which provide seeds, fertilizers, agrochemicals, credit, marketing, and so on. All except seeds and fertilizers are supplied by the private sector. To ensure that adequate and timely supplies are available to farmers, the government has expanded its network of sales points for seeds, fertilizer, and some agrochemicals through the 500 Agricultural Service Centers. There are nearly 5,000 government Cultivation Officers whose functions include the arranging of timely supplies in their own areas. To make these officers aware of what seeds, fertilizer, and chemicals are recommended and required by farmers, when, and in what quantities, a series of short-duration training programs is conducted every season at the DTCs.

To improve this further, we propose to invite the local officials (Agrarian Services and Marketing personnel) to the fortnightly training classes when necessary.

ISSUES IN TRAINING

The availability of suitable messages appropriate to the physical environment and the social and economic condition of the farmers is of fundamental importance. Training is effective only to the extent that such messages become available—messages that are specific, profitable, and low risk. Under irrigated farming conditions, for instance, a fair amount of information is available, but under dryland or rainfed conditions and in marginal areas availability of information poses a problem and implies the need for more

Figure 6-2. Schematic of the Roles Played by Research, Training, and Extension in Support of the Training and Visit (T & V) System in Sri Lanka



research work. Until such time as research information becomes available, local innovations have to be utilized. Perhaps this may have to be supplemented by training members of the farm families in how to increase their nonfarm incomes.

Associated with the above is the need for adequate documentation of the results of research and of good farming practices. To provide adequate incentives for scientists, we have formulated a scheme of payment of honorariums to writers and have set up a printing unit for production purposes.

As the T & V system develops and field staff regularly meet farmers and understand their problems, the need for upgrading all levels of staff becomes evident. We are revising and improving the curriculum for preservice training and are sending a few AIs to the universities for degree courses and a few AOs and SMSs for postgraduate training. But there are weak areas, and there is a need to identify good structured courses abroad where such courses do not exist locally. Supervision and management, extension communication, and training evaluation are instances.

Extension should reach and motivate almost all the farmers. This is the ideal situation, but because of various reasons this is not easily achieved. Our approach has been to work with farmer groups, which are visited by VLWs fortnightly. These groups nominate their own representatives or contact farmers. Experience has shown that the system works well where farmers live close by on their farms; are full-time farmers; and have access to water, inputs, credit, markets, and so on. In areas with part-time farmers, the times of visits are often adjusted to suit them. This is not easy in areas where farmers live in scattered villages isolated from each other. Our approach has been to support the T & V system by institutional training of selected farmers and youths at DTCs, by training of local officials and staff of voluntary organizations, by organizing field tours for selected farmers to see progressive farms, and by use of the radio. This approach is illustrated in figure 6-2. The VLW is involved in all such activities.

The quality and effectiveness of training are also matters of concern. At the RTC, postcourse evaluation is conducted, but this is not always adequate. Training in skills receives priority wherever possible in the training programs. Besides these, supervisory officers and visiting trainers carry out informal evaluation by meeting farmers and by attending fortnightly training classes, field days, and so on. Ad hoc studies are also being conducted by SMSs to find reasons for low adoption rates. However, there is a need for developing a simple and reliable system of evaluation.

CONCLUSIONS

It is clear that strong training support is absolutely essential for the success of the T & V system. The extension staff at all levels require training on a continuing basis to improve their professional competence and confidence. During the operational phase, progress has to be constantly reviewed, and problems need to be resolved. Above all, this indicates the need for improving and strengthening existing training systems to include preservice, induction, in-service, and farmer training activities. A training system that could adequately cater to these requirements should be developed nationally.

The model developed in Sri Lanka—with operational linkages between research, extension, and training staff through the RRC-RTC and the RTWG in each agroecological region—has several advantages.

To promote acceptance of the new system, awareness and understanding have to be created in the minds of farmers, local officials, administrators, and others. This, again, has to be done on a continuing basis.

Training Extension Staff: A Comment

G. R. Galgali and John H. Lindt

Continuous learning by farmers and the agricultural technicians, who are the agents of change, is essential for agricultural development. However, people learn from experience without formal training. When farmers see other farmers growing new crops, using input supplies or improved equipment, they may try out techniques which appear to be beneficial. Where there are adequate marketing channels and local buyers who offer remunerative prices, farmers have incentives to learn how to produce more. Learning by trial and error takes place even in the absence of formal provisions for training courses or agricultural extension.

TRAINING FOR EXTENSION AGENTS

But, since the farmer is to be the principal user and beneficiary of the new and better ideas passed through change agents, the training offered these technicians should be designed with the farmer in mind. Training for technicians should also include items to improve their communication skills and background knowledge for later interpretation and transmission, but the primary aim in training for field technicians would be to impart information and skills for prompt passage to farmers, particularly how to overcome constraints which limit increased production, how to reduce risks, or how to produce more profit.

To provide farmers with profitable technology, the extension agent should possess relevant skills: he should be able to perceive farmer problems, offer useful advice, develop good relations with farmers, and communicate effectively. How can he best be trained to do this? For effective extension, continual training of agents is necessary. For a smooth changeover to the Training and Visit (T & V) system of extension, training assumes even more importance in the case of extension staff who have worked previously in other areas such as input supply, regulatory functions, credit delivery, or community development. Through such training, extension staff working in the T & V system should become more proficient in (1) identifying relevant technology needed by farmers, (2) diagnostic skills, and (3) appropriate communication techniques. To meet these requirements, training should aim to improve the skills and technical knowledge of extension staff and to generate the desired attitudes and values among them.

The training of extension workers may be formal or informal. The nature of training depends upon the needs of particular extension services and on the knowledge of extension workers. Regular fortnightly training sessions and monthly workshops are built into the extension system to provide most of the formal training. The main training programs typically include: (1) preservice or induction training, (2) refresher training, (3) orientation and reorientation, (4) preseasonal training, (5) special short-term or long-term courses on different technical topics, and (6) graduate and postgraduate

courses. Natesan's paper (chapter 6) provides an excellent description of how these different types of training have been developed and coordinated in Sri Lanka.

Informal training should take place when Subject Matter Specialists (SMSs), Agricultural Extension Officers (AEOs), and other senior officers and research scientists meet extension workers in the field. There is opportunity to make better use of these informal visits. The AEO meets with each of his Village Extension Workers (VEWs) in the field for one day at least once a fortnight and spends the whole day supporting their work in a functional way. When other staff meet with individual extension staff in the field, considerable effort should also be directed toward supporting and upgrading the quality of the staff.

The T & V system aims to help all categories of farmers improve their production and income by making most efficient use of all their available resources. No two farmers are in identical situations: thus, extension has to face the great challenge of helping millions of farmers with different needs through contact with field staff. Though the VEW is a grass-roots worker, AEOs, SMSs, subdivisional, district, zonal, and headquarters officers, as well as research scientists and resource persons from other supporting agencies need to be trained in their roles, organizational objectives, and technical areas.

Training such a large number of agents in the required range of different capacities cannot be done by a single institution or a few trainers. It also cannot be done on a casual or ad hoc basis. As we can see in Sri Lanka's experience, aptly conveyed in Natesan's paper, a system of training institutions at national level, state agricultural universities, and the SMSs within the extension service must share the responsibility. For deciding training goals, we suggest comparison between what is being done now and what ought to be done; a critical analysis of the following factors is required:

- Job knowledge and skills needed by different functionaries
- Equipment to be used on the job
- Problems faced by agents and farmers
- Behavior desired of extension agents
- Goals set by the organization.

TRAINING METHODS

Unfortunately, many training institutions generally adopt a rather dry, academic approach to training that is often limited to classroom type teaching. This approach may work well when new subjects are introduced to extension workers, but it stops short of teaching them all the necessary field skills. It may also result in extension workers' losing interest in such training after the subject content is known to them. To teach skills, training should be a balanced mix of theory and field practice. In many countries trainers themselves may need to be trained to adopt such methods.

Extension workers can be trained effectively by employing the following methods singly or in combination as the subject matter content, knowledge of trainees, and situations suggest:

- Functional method (learning skills through practice)
- Learner-dominant method (field trips, surveys, and laboratory work)
- Trainer-dominant method (lectures, counseling, case work)
- Cooperative method (group discussions, workshops, seminars, panel discussions).

The SMSs, on whom the responsibility of regular training of field agents predominantly rests, should use the above methods, as appropriate to the situation and the needs of extension workers, rather than use only classroom teaching. SMSs should be given time, allocated about equally, to learn by themselves by conducting research or visits to research centers, to make field visits to farmers' fields, and to teach extension staff.

A review of training in many ongoing agricultural extension projects assisted by the World Bank has shown that overemphasis has been given to theory and insufficient attention given to the development of practical skills. We would have liked to hear more in the keynote paper about that. We feel it is important to discuss this issue further because training of staff whose function is to improve a farmer's productivity will be more effective when these staff are equipped with the field skills they need.

PRACTICAL TRAINING AND TESTS

An extension worker can confidently explain a new practice to a farmer only if he can demonstrate it clearly. Without this ability, he cannot maintain his credibility with farmers. The first question for the trainer is whether the staff he is training are already familiar with this skill. If so, a reminder may be all that is required. But, if the skill or knowledge is new to the staff, a more detailed analysis will be required to identify all the actions the farmer has to take to master this skill. For example, if the technician is going to make a recommendation to "control broadleaf weeds in paddy fields with 1/2 kg of 2-4D per ha," would the farmer be able to do it? Good results can only be achieved if the extension worker has himself mastered the tasks involved and knows how to identify, explain, demonstrate, and practice them in detail. To apply the herbicide properly, the farmer would need to be able to identify broadleaf weeds and to mix and apply the herbicide evenly with a sprayer which he has calibrated and knows how to maintain. Therefore, the extension agent, if he is going to train farmers in all the required tasks, must be able to understand and perform them himself. The emphasis in training for farmers is on what they can do, and training should be planned so that the participant can demonstrate his new knowledge and skill.

Extension advice may not be appropriate or timely because the farmer's problems have not been adequately identified by extension agents. The lack of clearly defined objectives—objectives stated in a form which can be used to measure what the participant can do as the result of the training—leaves the instructors no choice but to lecture. It is well established that training is more effective when the same message reaches a learner through audio and visual channels, so that the message does not require only an abstract understanding. If the same information is presented in charts, pictures, or demonstrations, as well as being heard, it is more likely to be remembered.

In training for extension workers and farmers, the emphasis should be placed on doing. The best training aids are the crops, inputs, or other items actually to be manipulated. Training sessions in the field should be the preferred choice; photographs, drawings, "chalk talks," and so forth are not substitutes for visits to the field. The training session, whenever possible, should provide the opportunity for trainees to work with and practice the new skills. Learning is enhanced if there is active involvement of the audience in discussion, particularly if the discussion forces participants to restate in their own words what has been presented.

After leaving school, few technicians are subjected to formal tests. We believe that practical tests to assess whether the T & V agent can identify, list, calculate, apply, and demonstrate training course contents are essential in training programs. Tests given

before training can help to develop motivation or to identify items in which the participants are already proficient, thus allowing the instructor to devote the time to items of more common deficiency. Tests performed after instruction may reinforce the new knowledge or skills and permit the trainee to measure his own progress. When results of tests indicate a failure to transfer the new skills, the instructor will need to search for the cause and to improve the content, presentation, or motivation for the next training session.

PRESENT EXPERIENCE AND PROBLEMS

A main objective of training is to bring about desirable change in the behavior of extension workers. It is not done simply to improve their knowledge; they should digest what is taught them and apply it in their work to train farmers effectively. Experience with a number of extension services in World Bank-assisted projects suggests several common shortcomings of training.

- What is taught to agents may not be relevant to their work.
- Trainers lack psychological and communication skills for transferring their knowledge to trainees.
- Reasonable methods of assessing the effectiveness of training are absent.
- Information overloading (that is, too much information in too short a time) occurs.
- No linking of training to the resource situation of farmers is made.
- Training programs do not closely correspond to farming operations and do not explain the sociology and the economics of the main types of farm systems in the respective areas.
- Feedback on the effectiveness of training is lacking.
- Inadequate preparation is made by trainers.
- Coordination between trainers is lacking.
- Researchers give a low priority to training of extension workers in comparison with other activities, such as postgraduate teaching.
- The failure to utilize carefully time available for training, delays in getting training sessions under way until late arrivers have assembled, and limited opportunity for participation are common complaints about extension training programs.

These problems are particularly acute when most trainers themselves have had limited schooling and very short induction training (maybe only one month) and when the SMSs are new graduates with little or no practical experience. Mishra (chapter 10) has dwelt on this problem in his paper about Nepal's experience. In such cases we believe that much more emphasis should be placed on training by extension administrators.

Two of the shortcomings listed above concern the difficulty of assessing the effectiveness of training, or the complete absence of any attempt to do so, and the lack of feedback on this topic. We are pleased that Natesan has highlighted this issue in his paper. We strongly endorse his call for the need to develop simple and reliable means of evaluating training and would welcome documented evidence of good experience and suitable methodologies used elsewhere in this field. The T & V system rightly emphasizes "training" as the first tenet in its title. Thus, it is vital that we ensure that the effort and

money spent on this activity are giving the desired results and that training is continuously improved.

To remove the constraints discussed above and to make maximum use of the available expertise in training field staff, thorough planning of training programs by extension management is a must. A master training plan should be worked out that takes into consideration the short-term and long-term needs of the extension service, the present level of knowledge of extension workers, institutional expertise available within the country, expertise perhaps to be brought from outside, and the number and category of trainees. Task forces at the national, state, and district levels should closely monitor training. SMSs should be constantly seeking to improve their training methods and to make maximum use of opportunities for informal as well as formal training.

Management and System Maintenance

8

Management and System Maintenance in Extension Services: Experience in Thailand

Vorasak Pakdee

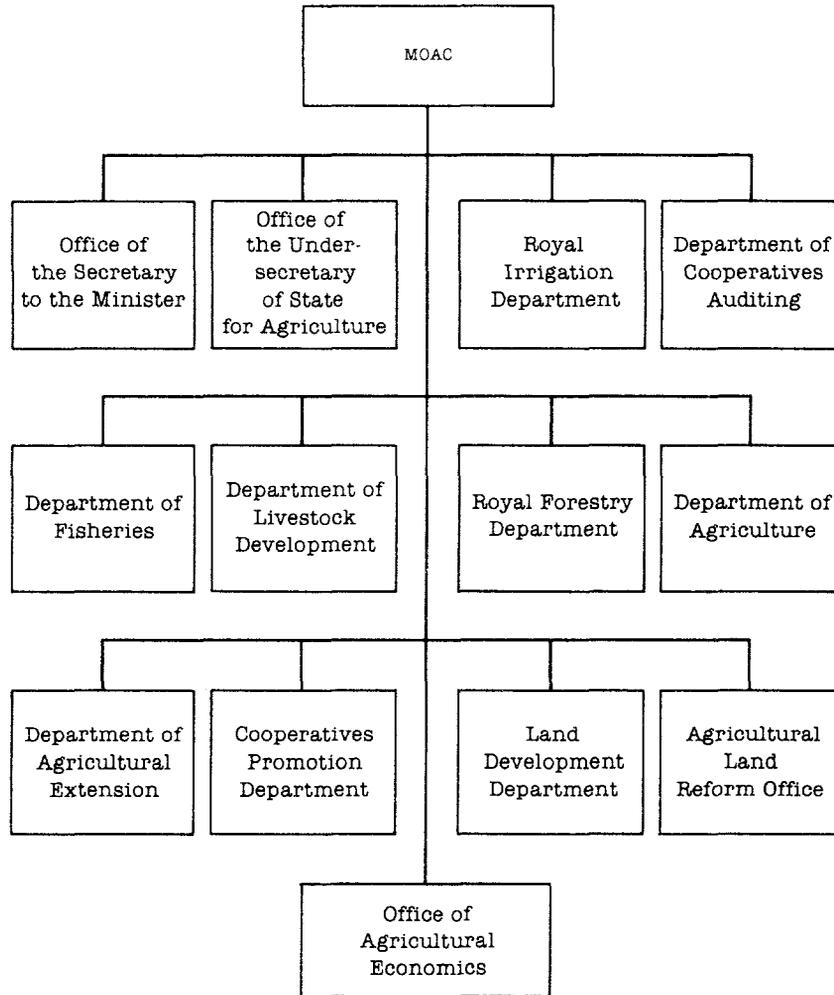
The kingdom of Thailand has a land area of 514,000 square kilometers populated by about 48 million. The population comprises well-mixed ethnic groups, about 70 percent of whom reside in rural areas. This rural population, whose livelihood is centered around agriculture, is the backbone of the agrarian economy. Of the total land area, about 40 percent is under cultivation. Agricultural products contribute about a 25 percent share of GDP reported, or a total of 623,732 million baht (B) for 1980. (In this and the following paragraph, figures cited are 1982 government data.)

Administratively, the kingdom is divided into seventy-three provinces, each administered by a governor. For the past twenty years agricultural production has expanded at a remarkable rate, averaging 5 percent per year compared with a 2.5–2.8 percent increase for the rest of the world. Thailand is the only country in Asia, and among only six countries in the world, that has had a net surplus of agricultural products for export continually for the past twenty years. The growth in agriculture has been essential in raising rural income and in reducing the poverty level (from 50 percent in 1961 to 25 percent in 1982). However, there are still wide gaps in the income levels between the agricultural sector and other economic sectors and also among different rural areas. It is therefore vital that there be further improvement in the agricultural structure of the country.

EVOLUTION OF AGRICULTURAL EXTENSION IN THAILAND, 1968–82

In the late 1950s, agricultural extension service in Thailand was scattered, located in various offices and departments. This poor administrative arrangement undoubtedly delayed the country's agricultural development for nearly two decades. The agricultural sector had almost been neglected by most of the governments, even though most of the export earnings had basically been derived from agricultural products. The situation was staggering for a certain period of time, until subsequent governments realized the importance of agriculture and gradually devoted more and more effort to improving it. It was rather difficult to review the whole process of organizational development in the Ministry of Agriculture and Cooperatives (MOAC; see organization chart in figure 8-1) due to the unavailability of evidence and the lack of documents. However, from several unpublished reports and discussions with a number of retired personnel who had been with the MOAC for a long time, there are indications that originally there was only one department by the name Department of Agriculture. This department was later broken into various small departments such as fishery, livestock, and rice, but the name of the original was still maintained. The sole reason for the break, which no one would admit, was to create the new positions of Director-General, Deputy-Director General, and so on.

Figure 8-1. Organization Chart of the Ministry of Agriculture and Cooperatives (MOAC), Thailand



Each new department would again establish its own extension service, the product of which is even now still partly in existence.

For those departments which were dealing with plant sciences, however, the concept of reunification did not fade away. There was a little difference in that all technical divisions would be put together and those of extension or extension-related divisions would be unified. One outcome, again, was the Department of Agricultural Extension (DAE). The DAE itself was officially established October 21, 1967, with only four divisions at the headquarters in the capital and more than 71 provincial extension offices and over 600 district extension offices all over the country. At the beginning there were 1,960 officials, of which about 5.2 percent were nonprofessional; the remaining 1,858 officials had varying levels of agricultural education. About 60 percent of the 1,858 officials had been working in 71 provinces (Singalavanija 1972). Since its inception, the department has subsequently been reorganized and modernized to cope with greater responsibility and increased complexity of problems. These developments can be summarized as follows to provide clearer information for further discussion.

First period (1968-72)

The original idea was to establish the DAE by unifying all extension services as provided by the Departments of Agriculture, Rice, Livestock, Fishery, and the Office of Undersecretary of State for Agriculture, with the sole purpose of providing full-time agricultural extension service to the farming population. Behind this idea there were several major problems, as identified by a number of former and existing administrators.

- The services as provided by each department had resulted in greater confusion of the government's role in agricultural extension.
- Such a fragmented service was considered very costly to operate and duplicated activities.
- There were also a discontinuity of services and an inconsistency in policies.

In addition, each extension unit of each department had long suffered from personnel shortages and inadequate training. There was no practical solution to these problems as yet. The emergence of the new department was one of various measures the government imposed in searching for better means of relieving the aforementioned constraints.

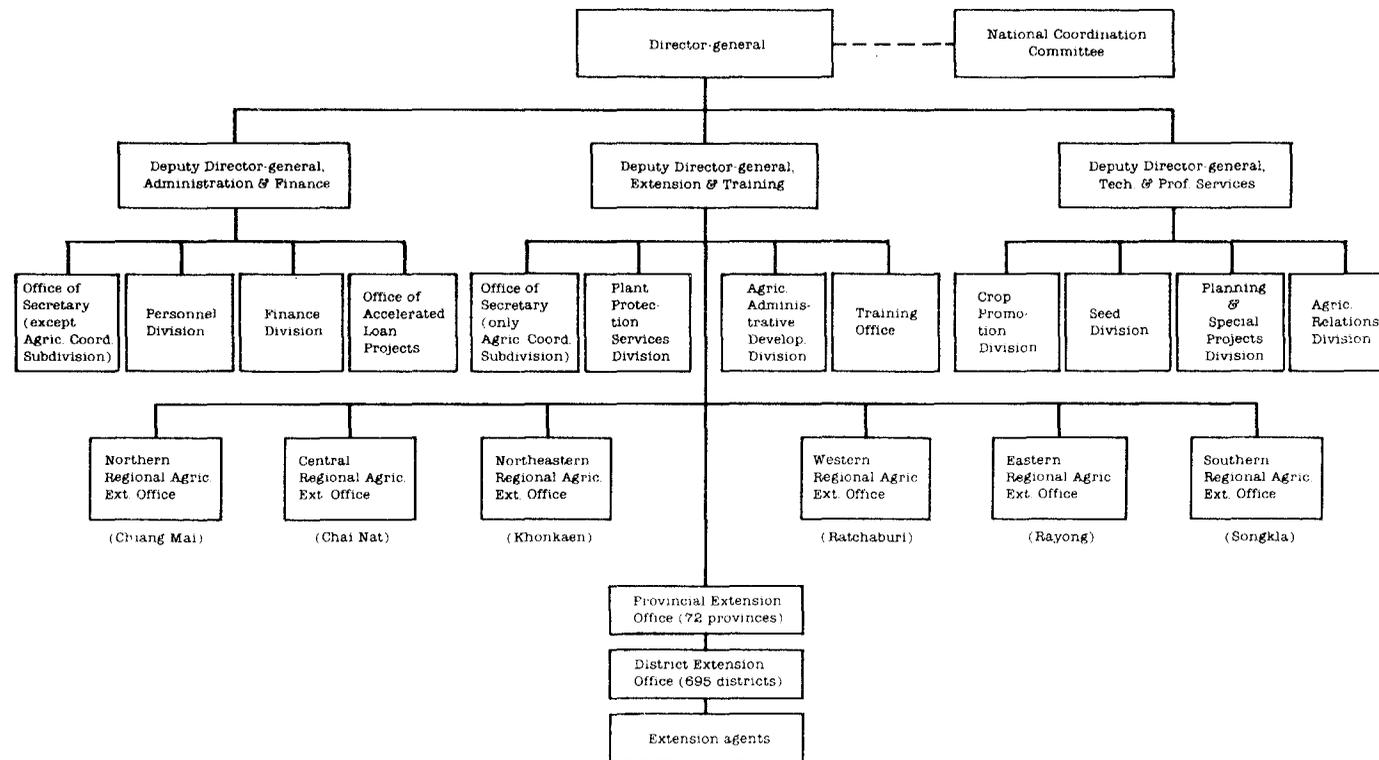
At this stage, the DAE was intended to house extension personnel from three major organizations, with the exception of those of the Livestock and Fishery Departments, whose services were more technical and regulatory in nature. The organization chart of the DAE appears as figure 8-2.

Second period (1972-76)

During this period the government, especially the MOAC, had been actively engaged in the development of irrigated agriculture; as a condition of the World Bank loan, the agricultural extension service within the project areas had to be improved. The DAE has been designated to provide extension services in these Bank-financed projects—a new emerging function.

In general, the DAE was not in a position to accept or refuse these new assignments. It still faced a number of obstacles—such as an acute shortage of personnel, equipment, transport facilities, and appropriate organization to take charge of the new responsibility—but refusal would automatically have eliminated the opportunity for improving these constraints. DAE had no alternative but to accept the additional assignment. The projects were designed to serve all farmers on the basis of an areal approach—a new

Figure 8-2. Organization Chart of the Department of Agricultural Extension (DAE), Thailand



concept which was considered to be the turning point for agricultural extension service in Thailand. However, the ratio of extension agents to farmers was still 1:10,000.

Third period (1977-82)

Various approaches have been undertaken simultaneously to attain the expected target; that is, to serve all farmers. The following measures have been given top priority and have been carried out:

- The number of staff and the ratio of extension agents to farmers have been increased through the concept of farmer foremen and tambon¹ volunteer-farmers, of which a 1:200 ratio had been obtained in the Irrigated Agriculture Development Projects and a 1:2,000-3,000 ratio had been achieved in most economic crop-growing areas.
- More authority and services have been delegated to provincial and district extension offices.
- Mass media have been used widely in support of extension services.

Emerging problems

The implementation of the approaches have uncovered many problems, a few of which are listed below.

- It was rather difficult to recruit so many staff within a short period of time.
- The quality of extension workers was too low.
- A close linkage with research was evidently important to extension work.
- Mass media alone proved to be inadequate because the majority of farmers did not have enough education.
- Mass media were unable to solve farmers' problems.

In view of these difficulties, the DAE considered the Training and Visit (T & V) system in consultation with the World Bank and the U.S. Agency for International Development (USAID). The government agreed to finance half of the total cost of the proposed project, the World Bank would take care of the majority of capital and operating costs, and USAID would be responsible for the training cost of the project. The T & V system of extension was thus launched for the first time in Thailand, in late 1977, as a joint project by the DAE and MOAC. The first phase covered thirty-three of the seventy-three provinces, and encompassed all geographical parts of the country. Coverage of the remaining forty provinces was implemented two years later, after the success of the first phase. There was a feeling among top-level government administrators that the project had resulted in a breakthrough in agricultural development in the rural areas of Thailand, and there was an indication of farmer' migrating from nonproject to project areas, where agricultural extension agents were actively operating.

PROBLEMS OF IMPLEMENTING THE TRAINING AND VISIT SYSTEM IN THAILAND

Some of the major problems encountered during the implementation of the T & V system of agricultural extension in Thailand can be summarized as follows.

1. Tambon is the administrative subunit of an agricultural district, or amphoe. A tambon comprises about ten muban, or groups of villages (usually about 100 farm families). Thus, a tambon encompasses about 1,000 farm families. An amphoe comprises ten tambon, or about 10,000 farm families.

- The T & V system always requires extension services to operate systematically and continuously, with the clear target of inducing changes in farmers' fields in all geographical areas. This self-monitoring approach has never operated anywhere else in the country, and no one was familiar with it. Because of this reality, it was rather difficult to persuade the people and the preproject extension personnel, who used to work in an easy way, to accept the new system fully as their way of life. They hardly realized the importance of their roles in rural development. Moreover, the majority of the personnel were likely to be uncomprehending of their own task because of lack of proper and sufficient training. Supervision of extension activities at all levels was minimal if it existed at all.

- The farmers themselves also were hesitant to cooperate with and participate in agricultural extension activities carried out by DAE extension personnel. The problem was later identified by the new T & V extension agents: most farmers were fully fed up with the rather bad impressions left by various failed projects which different agencies had earlier carried out in the area. After repeated dialogues with the extension agents, the people finally accepted the idea of extension work, and some of them have since contributed greatly, as crop demonstrators for their neighborhoods, in the process of technology transfer.

- Administrative arrangements within and outside the extension system were considered one of the hindrances to implementation of the project. It is a fact of life in many developing countries that the administrative arrangements of the government itself make it necessary for extension personnel to perform nonextension activities imposed by administrators at all levels inside and outside the extension system.

- Government policies also affect the progress of the T & V system to a certain extent. As for the case of Thailand, through my experience I have felt that, even though a loan agreement has been in force and the parties concerned must abide by it, the government still has full authority to waive the commitment if it feels such waiver necessary. The changes in government have also created a lot of problems. For example, when the limit of a 2 percent annual increase in the number of personnel of all government departments was imposed, it resulted in a shortage of extension personnel and a delay in recruitment.

- The T & V system of extension requires a continuous flow of relevant practical information from research to extension and to the end user, the farmer. The system was developed and implemented when research departments were not readily in a position to serve fully as the sources of relevant, transferable technology. The lack of relevant technology to disseminate to the farmers has hindered the T & V system to a great extent.

- Another aspect which has a great impact on the agricultural extension system is the lack of a long-term agricultural development policy and plan. Without such a plan and concrete policy, agricultural development operates inconsistently with the national economic and development plan. More specifically, agricultural research and extension must function hand in hand in the generation and diffusion of relevant technology to the farming population. In addition, marketing and agroindustry must be clearly designed, developed, and incorporated as parts of the plan for agricultural development to avoid incurring problems during implementation.

- The lack of understanding of higher authorities—especially those involved in allocating financial resources and manpower, as well as those charged with giving policy direction—has resulted in financial and manpower shortages and the creation of nonextension activities for the field workers.

Necessary adaptations

Because of these problems, some adaptations of the T & V system have to be made. For example, village extension workers (VEWs) have to be stationed at tambon as well as amphoe level and must cover more villages; village headmen and other leaders have initially been selected as contact farmers; trial plots formerly designed for researchers have to be tended by Subject Matter Specialists (SMSs); agro-economic zones have to be left out and major crops zones considered.

To enhance quick adoption of improved farming practices and to provide extension workers with teaching materials, some two to three small crop demonstration plots have been planted by the contact farmers in their own fields. Free inputs such as seeds and fertilizer were given. While these plots were designed to serve as a training ground for neighboring farmers, supplemental field trips and field days were arranged by extension agents to demonstrate clearly, step-by-step, improved agricultural practices to visiting farmers.

The projects and their implementation

The National Agricultural Extension Project (NAEP) I (1977-82) was formulated jointly by a special project preparation team in DAE in close cooperation with the Bank's Resident Mission in Bangkok. The project was intended to expand and strengthen existing DAE extension services in thirty-three of Thailand's seventy-three provinces. The NAEP II (1980-84) would expand and strengthen the DAE's extension services in the forty provinces not covered under NAEP I. The total project costs for NAEP I are US\$59.5 million. The World Bank share is \$28 million, and USAID contributed \$3 million as loans; the remainder was financed by the government. For NAEP II, the total cost is \$70 million, of which the World Bank and government shares are \$40 million and \$30 million respectively.

Some major activities of NAEP I are listed below.

- U.S. Department of Agriculture (USDA) training advisors arrived and started to train the national, provincial, and regional trainers. At this stage, a training module was developed for all levels of extension personnel.
- Recruitment of T & V field extension agents (village-level agents, or Kaset Tambon, KTs) from the project regions was begun to avoid problems of languages and dialects.
- In-service training of existing extension agents (district-level agents, or Kaset Amphoe, KAs; supervisors of the KTs) was begun.
- Preservice training of KTs in project provinces was carried out.
- Procurement of transport facilities was made ahead of time so as to provide all field extension workers with required vehicles after they completed their training program.
- Procurement and placement of expatriate consultants in agricultural extension and in architectural engineering was initiated.
- Offices and housing were constructed.
- Field extension personnel were assigned to designated areas of responsibility for selection of contact farmers and carried out their job.
- Field supervision by senior headquarter staff and expatriate consultants was initiated.

- Fortnightly training was planned and conducted according to geographical groupings.
- The T & V extension system was set in operation.
- Activities such as establishment of crop demonstration plots, trial plots, field days, and the like were carried out.
- A baseline survey was carried out by the newly established Monitoring and Evaluation Unit (MEU; see chapter 12).

Operational problems

As expected, there were several operational problems during implementation. Some of the major ones were:

- Initially, some transfer of staff at headquarters weakened the existing capacity of the project implementing agency. Since all staff had been thoroughly trained in preparation for implementing the project, any duty changes resulted in a shortage of project personnel and disruption of planned activities.
- Provinces entering the program needed a clear briefing of the project concept because the provincial governor has full administrative authority over all extension personnel working in the province; if he did not fully understand the project, it would be difficult to implement the system.
- Recruitment of KT's was formerly the responsibility of the Civil Service Commission. Its approval must be obtained to undertake this recruitment in the project area, and all regulations pertaining to recruitment must be followed. This inconvenience was not initially expected. Worst of all was the shortage of applicants for field extension posts (KT's) caused by a change in government policy to produce more graduates in agriculture with the B.S. than with the 5-year diploma. This change motivated the majority of graduates with 5-year diplomas to undertake additional study, and this is reflected in the great number of vacancies of KT posts during 1979-81.
- Basic training of new recruits, both SMSs and KT's, is inadequate. The schooling of most has been oriented toward theoretical general agriculture, which is insufficient for a qualified professional extension worker, who needs practical know-how. Besides, the basic training of some Provincial Extension Officers (PEOs), Assistant PEOs, District Extension Officer (DEOs), and Assistant DEOs was insufficient and considered to be much lower than that of KT's. This discrepancy urgently needs to be rectified and training strengthened if the extension service is to operate effectively and efficiently.
- Facilities are also needed and should be readily available. Experience has given clear indication that facilities such as housing for KT's should be there when KT's have completed their training and are ready to assume their posts. Moreover, teaching aids (like flip charts) on relevant subjects should be ready for use; without these KT's' regular visits would be affected.
- The most crucial problem hindering regular extension service is transport. Field extension agents are equipped with motorcycles; for higher-level extension supervisors, pickup trucks have been provided to facilitate the transport of input supplies for trial and demonstration plots to remote villages where public transport is not available. The pickup was also used to bring interested farmers to observe agricultural activities in areas where early adopters had already used recommended improved practices.
- Budgetary constraint is the greatest obstacle in carrying out extension service through the T & V system. The effects of insufficient budget throughout the Thailand experience are manifolds. For example, the number of visiting days for KT's to villages under their responsibility ranges from twenty to twenty-two days per month, but the per

diem allowances have covered only twelve to fifteen days; for gasoline, an allowance of only B200-300 per month (less than US\$15) was allocated. Besides, the KT needs some budget for preparing his or her teaching materials, a budget that was not allocated. In addition, a budget was needed for holding small or large field days for the farmers. Again, no such budget was allocated; the KTs had to spend out of their own pockets for the minimal hospitalities—buying ice, soft drinks, and so forth.

Functional problems

These problems are no less important than operational ones, since they more or less concern human behaviors, both physical and mental. Some major functional problems can be summarized as follows.

- Staff morale is likely to be one of the most important problems whose effects could have direct impact on staff job performance at all levels. The experience has given us a great deal of information on how to vitalize or revitalize the T & V extension system. First of all, the spirit of all extension workers must be maintained at a high level. This could be achieved through various measures depending on circumstances—such as establishing mutual understanding on the ultimate goal of the service; keeping the public informed and seeking support and recognition from various other sectors; offering rewards, such as fellowships to further education, to those who have performed their jobs outstandingly.

- As mentioned earlier, the basic training of extension personnel varies according to level and type of education (the lowest level is that of three-year vocational-agricultural school graduates; the highest is that of B.S. or M.S. graduates from colleges or universities). This difference in basic education of personnel has made it rather difficult to formulate an effective training curriculum and to conduct training programs, since the trainees have varying degrees of comprehension. Trainees with higher basic education usually understand the lesson well ahead of those with a lower level of education. Many observations from the performances of both groups when they were in contact with rural people have revealed in many cases that those with a superior educational background often succeeded in getting people to adopt their recommendations faster than did those with an inferior educational background. In addition, it was also noticed that those with insufficient basic training normally are reluctant to approach people. There was a feeling among observers that this behavior must derive from a feeling of inferiority in educational background, and this problem undoubtedly needs urgent remedy.

Training must be continuous and relevant to the actual practices of the farming population in specific areas. "Impact points" should be prioritized and made sequential to speed up the adoption of such practices. Without impact points, one would not be able to evaluate clearly the extent of one's success in the transfer of technology to the end user.

- Visiting is considered to be the most important element of the T & V system of extension. The visits must be regular and the schedule well known to the villagers, and on each trip the KT must be well equipped with practical, relevant know-how, that is usable by the clients. Such visits should not stick to only the meeting points but should also be extended to the various farmers' fields, as many as possible. The experience in Thailand indicates that visitation to villages on many occasions was not practical because most farmers normally spend most of their time in their own fields during peak periods of crop seasons. It would be more operationally efficient to use a combination of contact points during different seasons—except in irrigated areas, where the points of contact should be right at the chak (irrigation canal) so that farmers utilizing irrigation water from the same chak would be grouped together for equity in using water rotationally all year round.

In some circumstances there is a need for slight modification of the visiting point, but the farmers must be informed in advance of such changes, and it is necessary that the visiting system be kept as punctual and regular as possible. The farmers must be well aware of the day and time of the visit, and they should be invited to come to the visiting point with problems or questions relevant to their normal activities.

Our experience shows that some of our extension personnel did not visit the farmers regularly. Some said that they were engaged with too many activities, and some simply said that they did not know what to do because of the lack of water for farmers' fields. All of these excuses explicitly show the extension workers' lack of understanding of and loss of interest in their own roles but also imply that there was a lack of close supervision. Close supervision is a "must" in implementing the T & V system at all levels, and it should go hand in hand with the visits.

- Another functional problem likely to need more attention is that other activities in addition to their regular duties have been assigned to VEWs by top administrators and the government. Most of these activities are nonextension in nature, such as rural job-creating activities involving construction or repairing of roads, canals, small reservoirs, and the like. These activities are becoming greater in quantity and wider in scope as the government's rural development program is getting wider and greater support from the public. The DAE staff, as well as associated financial institutions, have expressed extreme concern over the issue and look forward to an appropriate resolution.

- Most of the extension agents are obviously looking at their career ladders and job incentives. The Civil Service Commission is the agency with sole responsibility for laying down and keeping the rules and regulations connected with post uplifting or promotion opportunity of all government civil servants. On the basis of our KT's qualifications, it is possible that they would be eligible to be promoted up to PC (position classification) 5 level. However, their status as KT's will remain the same. Some KT's might be promoted to Assistant KA or KA, but very few positions will actually be available each year. Hence, in the future the DAE might have to look for other alternatives to keep up the morale of these people.

- Contact farmers are an integral part of the T & V extension system, they are selected by and from the villages at a ratio of one to ten. They are considered to be the most important persons in the village; since they are an integral part of the village, whatever they say or do would have great impact on the villagers. These contact farmers in our experience have been designated to represent the villagers and have served as crop demonstrators or model farmers to impart new and improved practical technology to their neighbors. The problem is the contact farmers' inadequate basic training, which is as low as only four to six years of elementary school. It would be a terrible mistake to expect too much too early from these farmers in the dissemination of technical information to neighboring beneficiaries. The contact farmers must be gradually trained not only in practical improved agriculture on their own farms but also in ways of effectively communicating with their target audiences.

- Coordination with other organizations is another complicated problem not easily resolved, especially in a bureaucratic country such as Thailand. The World Bank's Appraisal Mission envisaged this and consequently tried to establish a workable coordination mechanism at all levels by calling for the appointment of a National Coordinating Committee at the country level and a Provincial Coordinating Committee and a Technical Advisory Panel at the provincial level. These committees, however, did not function very well because a regular monthly meeting of all department heads at the provincial level was already in existence and still operational.

From our experience, this impracticality is also simply a result of the managerial inferiority of the PEO and, possibly, of his perception of working with others. In many cases, some operational problems could be easily resolved at the Provincial Coordinating Committee meeting if such problems were proposed for discussion. It likely becomes traditional for PEOs to rely mainly on headquarters to solve their problems. One simple reason for their doing so is the gesture of working hard, the indirect indication to superiors that the PEOs are in fact dynamic in their jobs. This misconception must be changed so as to help rural people to solve their immediate problems at the appropriate time.

SOLUTIONS TO PROBLEMS

Our experience with a nationwide T & V extension system has repeatedly assured us that any attempt to arrive at a solution of problems with great variations in scope and dimension will often result in failure. The following is a good illustration of how difficult it is to convince people and get them to accept what one wants. In this particular case, the DAE was ordered by the MOAC to take an active part in government-sponsored rural job creation activities, which are mainly nonextension in nature. In response to the order, the DAE gave instructions to the provincial administrators to rearrange the schedule of visits to include sites of rural job-creating activities in as much conformity with the regular T & V visiting schedule as possible. However, this suggestion was somewhat neglected by all people concerned because they considered that the government order was of top priority and that no departments could issue different instructions. A similar situation arose during the early years of implementation of the T & V system, when the policy on the paddy price-supporting scheme was hurriedly carried out by the government as a political measure to cope with the lower price of paddy. In this connection, the DAE field personnel were assigned to assist in the survey of paddy output as well as to locate the sites of paddy collection for buyers. The DAE has no way to oppose such an order since it is the policy of the government, but the DAE did decide to instruct its field personnel to abide by the order while carrying out additional activities at the same time. This instruction, however, did not meet with much success because provincial and district administrators had to comply with the government policy, and they were empowered to exercise their authority accordingly. From the above-mentioned examples, it is explicitly imperative that the government must fully understand the whole concept of agricultural extension service before adopting the T & V system.

Some other obstructions to the smooth implementation of the T & V system that are unlikely to be easily resolved can be cited here. First is untimely delivery of motorcycles, which not only affects the visiting schedule of the KT's but also their morale. Too much delay reduces the KT's interest in his or her work; if he or she has to wait for transport and gets used to staying in the extension office, office work will gradually build up to become a habit, and ultimately there would be no extension service at all. Second, inadequate housing facilities for KT's have led to a controversial situation in which the KT is able to excuse himself (herself) for not staying in the assigned village. According to the government regulation in force, the KT would not be eligible for a housing allowance if he were appointed to the area for the first time. This condition would be reversed if the KT were being transferred. Third, the most important problem—which is likely to be one of the most critical issues discussed in this workshop—is career incentives. It is generally

recognized that many executives are not happy with this sensitive issue and are looking for appropriate resolution. The DAE did try to find as many approaches as possible; however, there seem to be a lot of problems associated with each approach. For example, we did adopt both short-term and long-term measures to reward outstanding extension personnel with fellowships and opportunities for further study. Both measures still face limited funds and quotas. When looking at their career ladder, again, one sees that the KT's promotion opportunities are very limited. It is in the interest of all for us to look into the matter very seriously and, one hopes, to come up with realistic ways and means to solve this immense problem.

In conclusion, it is rather difficult to overcome problems which naturally derive from the policy of the government because such enforced policy often serves its own political interest. Yet there are problems which the DAE has encountered but has met with a strong intention of finding appropriate solutions. Because of such effort, some of these solutions have been fully accepted and become government policy. These include the following.

- Recruitment of government civil servants, formerly centralized at the Office of the Civil Service Commission in Bangkok, became decentralized to regional areas, which makes it possible for the DAE to recruit extension agents in each region from local applicants. This decentralization has given the DAE an opportunity to recruit applicants who speak the local language and to avoid future requests from KT's for transfer to their home towns, which in turn helps save on moving costs allowable for eligible officials.

- Training of extension personnel becomes systematic from headquarters down to the district level. Formerly, training was not relevant to what was needed by the farmers; worse than that, each level of training was not related to the other and was scattered in different directions in various agencies of the DAE. It has become policy now that training will be arranged in accordance with the need of the local people and for the sake of the people themselves. Impact points have been recognized and stressed.

- It has become policy as well that Provincial Coordinating Committees must be briefed by the project officers on the project's concepts, approach, and expectations.

- The initiative of the DAE in solving the problems of coordination with other agencies was accepted. The fortnightly meeting of KT's and contact farmers will be the focal point where the four major ministries involved with rural development—namely, Ministry of Interior (Community Development Department), Ministry of Education (Informal Education), Ministry of Health (Department of Public Health), and MOAC—will jointly meet with contact farmers as well as interested farmers.

- KT's role in rural development has been clearly demonstrated, and as a result the government has appointed a KT to serve as advisor to the Tambon Council on agricultural development.

- The MOAC realizes the importance of KT's in agricultural development; as a result, a KT is designated as a representative of the Ministry. The KT is obliged to be responsible not only for crop, livestock, and fishery as originally proposed, but also for forestry and other development aspects of the Ministry. This symbolizes its grass-roots unification of efforts.

- Supervision was not generally mentioned among development agencies, but it now has become popular at all levels of government agencies. The Office of the Prime Minister, which has had nothing to do with supervision, has now become very active in this area.

There are many more issues whose solutions once presented major obstacles but have finally become the policy of the government because people are convinced of the value of what is happening in the rural area as a result of agricultural extension services.

PRESENT SITUATION

- The situation now far exceeds what was expected five to six years ago. There has in fact been a revolution of extension services in Thailand. Taking the number of overall extension personnel in the past and comparing it with the present, one sees a huge increase, both quantitative and qualitative. The extension service today is operating on a well-known T & V system almost throughout the kingdom. KT's are carrying out their regular visits according to fixed schedules in the areas for which they are responsible. Words of praise for these young extension workers spread out from place to place and from the lowest to the top decisionmaking levels. They are well recognized by the general public—especially in remote rural areas, where people rely on the regular service of these extension agents.

- Some apparent weakness still remains in part of the system, especially in the technical support of the SMSs. These SMSs are in general new graduates from colleges or universities, and they have no field experience whatsoever. To strengthen their capability, the DAE has given top priority to training these SMSs intensively to provide better technical support to the KT's—a system of continuous training starting from an orientation course for those preservice new recruits, and proceeding through an in-service five-week course, a monthly one-day course, and subsequent refresher courses. The SMSs' situation has steadily improved, but there is still a shortage in SMS positions. The project requires five to six SMSs to a province; instead, only two to three posts have been allocated by the Civil Service Commission. The DAE is still in the process of negotiating with the Commission.

- Agricultural research and extension linkage is much better than in the past. With strong initiative on the extension side and with greater support from the National Coordinating Committee, an official Inter-Departmental Coordinating Committee between the Department of Agriculture and the DAE has finally been established. A few meetings have been conducted, and certain agreements for further cooperation have resulted. This continuing dialogue is still going on, and it is hoped that it will be of wider scope in the future.

- With dynamic extension service through the T & V system, the government has now taken a serious look at the development of agriculture in the majority of the land area under rainfed condition. This area, according to the fifth national five-year development plan, is considered a poverty-stricken area where people live in a very unpleasant situation. The government realized this fact and consequently announced the plan to accelerate rural development in this area in order to improve the living standards and the quality of life of these poor people. Agricultural development is among the top priorities under this accelerated scheme, and KT's have been assigned to be fully responsible.

- KT's not only are responsible for transferring improved and practical technology to the farmers, they also are charged with organizing farmers, housewives, and rural youths into various dynamic groups in their areas. These groups are considered the information mechanism whereby people can discuss and make appropriate decisions together. The DAE has long been attempting to mobilize all members of the farmers' families to make them more aware of their share in the family life. The farmer's wife is encouraged to join in a small Housewife Group, while the children are urged to take part in the Rural Youth Club. The farmers themselves are loosely formed into a Production Group, formerly called the Farmers' Group, with close aid from KT's. Contact farmers are the core in the formation

of such groups and are intended to provide the leadership role. These groupings are organized at this early stage for the purpose of obtaining specific training in agriculture and agriculture-related subjects. The housewife is trained in home economics subjects such as food preservation, nutrition, cooking, home care, handicrafts, and the like. The home economics agent will work side by side with the KTs.

NEW CHALLENGES FOR THE AGRICULTURAL EXTENSION SERVICE

The government's fifth five-year National Economic and Social Development Plan (1982-86) expects agriculture to contribute substantially to the country's general economic growth, which is targeted at 6.6 percent per annum; to provide employment to about 50 percent of the annual increment to the labor force (about 700,000 per annum); to sustain growth of export earnings; and to play the lead role in alleviating rural poverty. These expectations of the government will certainly not materialize without extension service. In fact, DAE is fully aware of this important task, and it is obliged and ready to take up this new challenge without hesitation. We are confident that, with full support from all government and private agencies concerned, we can meet any obligation. At present, it is generally accepted that farmers are readily capable of producing some major crops close or up to the government's target—and are capable even of producing a surplus in some crops, which can then be reflected in the lower price of such crops.

With the continuing effort in extension service by the T & V system, it is observed that most cultivable land in either irrigated or nonirrigated areas has been planted to a certain degree to second or third crops of rice or field crops. In nonirrigable areas where water resources are rather scarce, people have been encouraged to dig a shallow well and to plant with short-lived crops on the surrounding land. This activity has spread out very quickly among villages, thereby helping keep these local people partially employed in rural areas. It is a pity, however, that the extension service has not been mentioned anywhere for its effort and contribution to increasing agricultural production as well as to slowing the rate of rural migration to urban areas. On the contrary, the production increases and rural employment have always been attributed to climatic conditions.

In the poverty-stricken area, the extension service is expected to play a greater role in a wider scope of activities to induce these poor people to produce enough food for their own consumption and to earn a little more income to sustain their daily lives. In this respect, a low-cost input technology will be considered a top priority for imparting to the farmers. In some cases, some small subsidy in inputs such as seed might be offered to help them to start.

The DAE has also proposed to the Food and Agriculture Organization (FAO) a Small Farmers Development Project to be implemented in early 1983. If this is approved, it will be a complementary part of the T & V system.

As agricultural development continues to have more and more impact on the social and economic growth of the country, agricultural extension will become more and more a necessary government service to the farming population. More sophisticated technology will be developed as more progress has been achieved. Training of SMSs and KTs in relevant technology will have to be further strengthened and emphasized. At the same time, more and more use of mass communication media has to be incorporated in support of the T & V extension system to keep it viable and dynamic.

The DAE's radio broadcasting station is gradually developing its program in support of the KTs' field activities. In addition, many provincial and regional information officers have been trained to be communication and radio broadcasting specialists, who would

utilize the local mass media, especially radio stations, to disseminate agricultural information to the farming population. Aside from these, those regional mobile extension units that are fully equipped will travel from place to place in support of KT's field activities. By showing movies and slides of actual farmer's fields, these mobile units will impart new practical knowledge that has paid off elsewhere. Media use is one of the most important tools in support of the field extension agents in the discharge of their duties.

CONCLUSIONS

More efforts are now being made to integrate all extension methods and programs in a more systematic way to support the T & V system. Moreover, arrangements have subsequently been made to seek more cooperation from all concerned agencies in tackling ever-increasing problems. Much more time is needed to get people to comprehend fully the actual philosophy of extension service based on the T & V system. According to our experience, as mentioned elsewhere in this paper, we have been faced with problems varying in degree, size, scope, and dimension. With strong leadership and cautious moves, however, Thailand can boast of its success in getting the T & V extension system installed and operated nationwide. We are confident that, with full comprehension and strong support from all sectors of the government and the public, rural development in agriculture as specified in the fifth five-year national plan can materialize and that all targets set can be achieved.

A survey made during 1977-78 by the Monitoring and Evaluation Unit (MEU) of the DAE revealed the following (see also chapter 12).

- Fortnightly training has been carried out according to schedule, but the role of trainee and other participants should be reconsidered. KT's and all audiences have realized that the training has given them additional knowledge and assistance in solving problems, but KT's attributed less importance to training than did others.

- Visitation to villages by KT's has been under way, but no actual visit schedule was observed in 1978. KT's often pay visits to villages where they have special activities. Most KT's, contact farmers, and ordinary farmers prefer to have a fixed visiting system. In any event, a large number of farmers did not know the visit schedule; therefore no advice was given them by KT's. In 1980 the majority of contact farmers knew the visit schedule, and ordinary farmers did not. As a result of the visits by KT's, the adoption of new technology for rice and pest control was recorded.

- Crop demonstration plots have been established to some extent; however, delayed delivery of inputs has impeded the program. A minority of farmers knows about these demonstration plots.

- Supervision by provincial extension offices and regional offices was minimal. In 1980, the follow-up reported that supervision conducted by PEOs had reached only three-fifths of the fixed number given by DAE, while KAs conducted up to three-fourths of DAE's assignment.

- In response to inquiries about farmers' attitudes toward KT's performance, most contact and other farmers were satisfied with KT's activities.

In addition, the final evaluation report of the joint evaluation team of USAID and the government concluded the following.

- "Currently most subject matter specialists view the research station as a means of solving immediate problems rather than as a continuous source of new knowledge. A formal linkage to facilitate the diffusion of research results to the farmers and to ascertain the needs of farmers through extension is recommended."

● “Although there are many remaining problems related to farmer adoption of recommended crops and practices (e.g., insufficient location specificity in the recommended packages, lack of dependable prices for products, unfavorable changes in agroclimatic conditions and nonavailability of affordable agricultural inputs), there is clear-cut evidence that farmers have been adopting new practices for certain crops.” The recommendation given is that “research needs to be conducted to facilitate the development of recommendations which are adapted to specific conditions that exist in the various amphoes.”

● “It appears that career opportunities for the KT and KA are limited. Additional incentives appear necessary if maximum production is to be realized.”

● “There is a definite trend of greater contact farmers’ contact with KTs over a period of time, as would be expected.”

● “Contact farmers were reported to be in increasing association with extension staff, especially the Kaset Tambons who have longer tenure in the subdistrict. Farmers noted KT as the source of assistance for insecticide, seeds, equipment, and advice. It was also noted that the longer a KT remained in the tambon, farmers seemed to be more reliant upon the KT than upon the headman, COF [contact farmer], KA or neighbors.”

In addition, the DAE implementation reports collected during 1977–81 concluded the following.

● “Rice yield per rai was reported increased by 86.6% in the first four provinces under the project.”

● “About 60–80% of farmers under the project adopt new Technology.”

● “There was a 10% increase in acreage under dry-season cropping.”

It was reported also by the National Auditing Office, after following up the projects’ field activities for some time, that

● Most KTs are following the visiting schedule.

● Supervision at provincial and district levels is rather weak.

● The adoption of new improved practices has increased as a result of regular visits of KTs.

● Marketing becomes more and more important in extension work, especially in promoting more crop production (not having a reliable marketing channel would only create a negative impact on extension agents who are working in the area).

From all the observations made and surveys conducted and from my personal evaluation, I have very strong confidence that the extension service, using the T & V system, will perpetuate and finally succeed in transferring new and improved agricultural technology to the farming population—provided that full support from the government and the general public is totally committed. To keep the T & V system operational and dynamic, one must be ready and well prepared to cope with any problems occurring at any cost. As the system is fully installed and operated on a regular basis, more and more problems will be created, and greater and wider efforts to look for appropriate solutions will be needed. In other words, the T & V system if it operates properly is itself fully dynamic and challenging.

REFERENCE

Singalavanija, T. 1972. “The Department of Agricultural Extension in Thailand.” Bangkok: Department of Agricultural Extension, Ministry of Agriculture and Cooperatives.

9

A Modified Training and Visit Extension System: Experience in the Philippines

Francisco G. Rentutar and Romeo V. Aquino

When the National Extension Project (NEP) was launched in the Philippines in 1979, local conditions augured well for the effectiveness of its basic concept—a modified Training and Visit (T & V) system. The system depends crucially on a dynamic two-way relationship between field technicians and farmers; for this to exist, the technicians' advice needs to be relevant and respected, and the farmers need to be able to implement it and to articulate their problems in doing so. Most field technicians in the Philippines have degrees in agricultural science—an unusual situation for a developing country to be in. Moreover, the technician-to-farmer ratio is high—1:250. The farmers themselves are generally well educated and receptive, and the NEP has been able to engage the participation of the whole family in its extension work—women and youths as well as adult males—in accordance with existing farming and cultural patterns. This combination of advantages has been an important factor in the success of the system, in spite of some continuing difficulties, and promises to be critical for a continuing strong commitment to it at the field level.

OBJECTIVES AND PROBLEMS

The overall objective of the NEP is to strengthen the extension service in the Philippines and to make it more effective. Partly financed by the World Bank, it is a six-year program whose specific objectives are:

- To promote further production increases in the main food crops
- To expand livestock production
- To improve family income, nutrition, and general home management
- To reduce rural unemployment by assisting out-of-school youths to establish small-scale farming.

These objectives should be seen in the context of the importance of agriculture in the Philippine economy, and of the state of extension services at the time the NEP was being formulated. About 70 percent of the Philippine population live in rural areas. Agriculture contributes 30 percent of GNP and 60 percent of export earnings and employs over half the nation's labor force. It is a main contributor to the economy. The primary crops are rice and maize, rice being by far the most important. In 1969 a national program was created to achieve food self-sufficiency in rice and other crops such as maize, fruits, and vegetables. As a result of these efforts, the Philippines became self-sufficient in rice in 1977 and since then has been a net exporter. The production of legumes, pigs, poultry, and fruits also expanded.

Despite these measures, rates of agricultural growth had not kept up with population by the end of the decade. Moreover, it was estimated that about 60 percent of rural families

still earned incomes below the level required to provide them with adequate nutrition and essential goods, although agricultural prices had improved. Since most marginal land had already been brought under cultivation, the increases in production that were needed clearly had to come from improved productivity on the existing farmlands.

Incentives for higher productivity had always been an important part of government strategy, which had included large investments in irrigation infrastructure, in high-yielding crop varieties, and in technical packages coupled with extension and farm credit. Under the different food self-sufficiency programs, in particular, there had been sustained efforts to encourage multiple cropping. But progress was slow. The private sector had been the forerunner in developing high-yielding, disease-resistant crops but had not been able to reach the point where these varieties could be made available in bulk to small farmers. Multiple cropping was constrained by management and disease problems, livestock production by inadequate feed production.

Meanwhile, the extension service itself had become weakened by division—different branches of government, indeed different units of the Ministry of Agriculture itself, had run their own extension services with different aims, different methods, and different employees. The resulting proliferation of activities had not only caused confusion among farmers but among the staff as well. Not surprisingly, technicians were inadequately trained—when they were prepared, it was only in the production of the crop to which they were assigned. In-service training was particularly weak, and specialists rarely were available to provide it.

The lack of a strongly centralized service resulted in all the administrative manifestations of an institution trying to do too much with limited resources. A quarter to a third of the field technicians were casual workers, and most had no means of transport and little equipment. Since they were—or perceived themselves to be—badly paid, they frequently neglected extension work and spent a considerable portion of their time in helping farmers to obtain credit and in collecting loan payments, for which they were paid a commission by the banks. One of the critical results of this inadequate institutional support for the effectiveness of the service was that commitment to extension became diffused. Technicians had little practical advice to give and had inadequate demonstration facilities. Therefore they were unable to be effective, and farmers had little productive contact with them.

STRONG CENTRAL DIRECTION

The reorganization of the service according to the modified T & V system under the NEP at the end of the 1970s was intended to improve the impact of extension and simultaneously reactivate rural commitment to extension advice. It was hoped that strong central direction would draw in the previously inactive talent.

The project has four main components: first, an organizational improvement through the establishment of a more unified extension service and closer collaboration between research and extension; second, the provision of facilities and equipment to improve mobility, training, and administration; third, the improvement of extension methodology by introducing sound extension methods, with emphasis on close supervision, regular training of extension workers, and regular farm visits; finally, the improvement of staffing and training, particularly for additional Subject Matter Specialists (SMSs) and livestock extension technicians.

Improving the organizational structure of the Ministry of Agriculture has been an essential part of the NEP. Reorganization aims to provide a single line of command from

the Ministry, via Regional Directors, to Provincial and Municipal Officers and to establish an integrated service of field technicians. Regional Directors have full responsibility for the NEP in their areas, and the existing Extension and Technical Bureaus no longer have line but staff functions at the national level. As is to be expected, such a fundamental reorganization has taken some time to effect, and it has brought with it delays in expanding the NEP's coverage, a need for more line-staff training in the modified T & V system, and more experience with implementing the modified system.

At the field level, however, organization has become more focused fairly rapidly. In most of the pilot areas, technicians visit farmers at regular, well-advertised, and frequent intervals—often only a week apart. In a survey of the progress of the NEP in the first four pilot areas, extension workers were asked what the main differences were between the modified T & V system they were implementing and the traditional extension methods they had been accustomed to. In order of importance, these differences were perceived to be: more emphasis on intensive training of technicians; more frequent field visits to the area; more emphasis on the use of contact leaders; the time-bound nature of their work schedules; an expansion in the area covered by extension and the number of people participating; and, finally, greater emphasis on group extension work. In their case, field-level extension had clearly become more systematic.

The provision of facilities has also improved; considerable investments have already been made under the NEP in an effort to improve support. In allocations from the national government, agricultural extension has obtained a steadily increasing budget—with an annual growth rate of 25 percent over the past five years.

In spite of the constraints imposed by the reorganization, the modified T & V system was initially implemented in pilot areas—each covering about fifty *barangays* (communities or villages)—in four regions and proved sufficiently successful to warrant its recent expansion to pilot areas in some eighty-seven districts, in all twelve regions of the country (although only about half of these pilot areas are active). The total number of staff fielded by the Ministry of Agriculture in this effort is now 2,500—sufficient to cover the whole country. Staffing is heavily weighted toward municipal and village-level workers, who account for 1,425 personnel.

The overall effectiveness of the NEP is difficult to gauge, both because of data limitations and the problems inherent in assigning effect to cause in a changing environment. But, in general, the modified system has been found to be related to the rise in aspirations and expectations of the farmers, the emergence of a new technical expertise in agriculture, a new concept of technical leadership on the part of the technicians, increased incomes of small farmers, and the entry of the *barangay* into the development process. There is much circumstantial evidence of individual progress. In one region, the introduction of farm fisheries and backyard piggeries led to good results; in another, vegetable cultivation was profitable; in a third, intercropping coconuts with peanuts, cocoa, bananas, maize, and root crops raised farm incomes. Some farmers have claimed increases in income of as much as 5,000 pesos (₱) a year. One farmer cultivating bitter gourds on a quarter hectare of land claimed a gross income of ₱18,000. (These figures compare favorably with the estimate for the poverty line, which is represented by an annual income of about ₱2,000 in 1982 pesos.) On the whole, the experience shows that integrating extension work with a range of farm activities has been effective in the Philippine context.

These results emerge from projects covering a wide variety of farming activities, ranging from the production of white and yellow maize, peanuts, and beans to the raising of beef, poultry, and swine. But the system has proved to be equally applicable to more intensive schemes. The Kabsaka Project in Iloilo—whereby two rice crops are grown under rainfed conditions in one wet season, followed by the production of an upland crop,

according to market potential—has, since 1981, been successfully yielding three crops a year over a cropped area that is expanding every year.

A survey of extension work conducted just before the modified T & V system was introduced serves as the basis for a comparison of the situation then and at the time of a recent evaluation. Some of the major conclusions of this comparison are that, in general: planning, supervision, and management had improved; the work load was appropriate to the effectiveness and efficiency of the technicians; communication systems had improved; productivity and net incomes of the farmers had increased; and there was more involvement and participation of the people concerned with extension.

However, one reason the coverage of the NEP is being expanded so cautiously is that there have been implementation difficulties in specific projects. The simultaneous reorganization of the Ministry of Agriculture has meant that institutional support is not yet sufficiently organized to make full use of the modified T & V system. A recent evaluation of the San Carlos Project is representative. It cites as major difficulties the lack of staff support and supervision, the lack of support by SMSs and by management, and a less than full understanding of the system on the part of field technicians. To quote:

Staff support and supervision is completely inadequate as evidenced by very few visits to field technicians. The District Agricultural Supervisor, who is supposed to provide intensive supervision, has on the average made only 3.5 visits per week where 18 visits are desirable. Subject Matter Specialist support is sporadic and without straightforward direction. There were very few in-the-field practical training sessions. Back-up support from the management in terms of logistics, materials, and moral support was not enough to motivate field personnel.

EXTENSION AT THE FIELD LEVEL

Field technicians under the NEP have a wide brief. They serve as channels of technology linking research and the farm, as coordinators and educators, and as providers of organizational and other services for production, marketing, agribusiness, rural youth development, and home management. Their activities range from the selection and recruitment of contact leaders and the organization of associations—for farmers or youth—to the provision of technical assistance on production methods, nutrition, or improved farm and homemaking practices.

Extension teaching is done largely through group and community activities, to reach as many extension clientele as possible. Farm and home visits are made by field technicians to each contact leader on a regular schedule. In the pilot areas, the technicians are assigned five barangays each, home management technicians ten each, and rural youth workers cover sixteen to seventeen barangays each. Thus, contact farmers are visited once a week, homemaker leaders once every two weeks, and youth leaders at least once a month. (However important frequent contact may be, it can have its drawbacks. The extension workers in the San Carlos Project, for instance, persuaded by the importance of strict adherence to a previously prepared time schedule which allowed for five one-hour sessions with five contact leaders a day, discovered that their contacts needed more time and that they were unable to provide it.) The nature of the contacts between extension workers and their clients is flexible and varies with the type of activity. In San Carlos, workers keep a modest office within reach of the farmers where programs can be displayed, contacts made, and meetings held. In the Kabsaka Project a Iloilo, where closer technical support is needed, technicians live in the villages with the farmers, to be there if required at irregular hours.

One of the functions of the field technicians under the modified T & V system is to help set up farmers' associations, anakbukid (farm or village youth) clubs, and rural improvement clubs. The guiding principle is that groups of people with common problems are better able to identify and articulate their difficulties and to discuss technical solutions than are individuals. This principle proved particularly valid for farmers producing single crops under intensive conditions, such as at Iloilo.

The link between contact leaders and extension workers is a crucial one in the modified system in the Philippines. Contact leaders are used to link the activities of government agencies with those of the community. They help to institutionalize new patterns of behavior that enhance socioeconomic productivity; thus, they do not merely organize people but bring about new behavior patterns in the community.

Great emphasis is placed by the Ministry on the proper selection and training of these contacts. A manual on the function specifies five basic qualities required of the incumbent:

- Psychological strengths: confidence, decisionmaking ability, emotional stability and maturity, motivation and initiative, resourcefulness, and love for common people
- Social qualities: ability to get along easily with people and to become involved in community affairs
- Performance qualities: capacity for effective work, innovativeness and creativeness, and ability to participate in informal education sessions
- Knowledge of and sensitiveness to community issues: awareness of and responsiveness to such issues, and ability to give advice to others
- Awareness of and working familiarity with development services: involvement in community organization and development programs, working knowledge of community and other resources.

All these qualities entail a willingness to work with people and to achieve social acceptance by the majority of the community.

The reasons for being so specific are warranted by the aims of the NEP and its limited resources. The handbook later explains:

The growing demand for more efficient and effective agricultural extension services necessitates the participation of the local people through the complementary delivery of agricultural services. The present extension manpower of the Ministry of Agriculture is not enough to meet the needs of individual extension clientele. Hiring more personnel may not be the best solution to this situation. If we want development to take place in the countryside at the desired pace, then program beneficiaries must be involved in efforts to improve and change their ways of life. Tapping local leaders is enhancing people's participation in the development process.

The efficiency and effectiveness of these leaders will depend on how they have been selected, trained, sustained, and motivated to carry out program expectations. Basically, they should be equipped with knowledge and skills on the three major areas such as community sensitization, community assistance, and community project development. The conceptual framework for this training program assures that leaders will be able to perform their functions in the community efficiently and effectively.

A report on the Kabsaka Project at Iloilo found that contact farmers "were able to identify for themselves existing and potential problems, for they offered alternative solutions. The regular visits with the extension workers gave them the opportunity to interact with each other to discuss problems. Technicians also became more accessible and could be contacted more easily by farmers."

The commitment of many extension workers and contact leaders is impressive and is assisted by an array of incentives. Agricultural extension workers, in addition to their basic salary, receive living and traveling allowances each month; plaques of recognition, scholarship grants (for degree and nondegree courses), and citations are also awarded for their contributions to the successful implementation of agricultural extension programs of the country. Agricultural inputs in the form of kits consisting of fertilizers and seeds are given free to contact leaders for demonstration, applied research, and training purposes.

The main conclusion of the early experience with the modified T & V system in San Carlos was: "If the extension delivery system is a success, it is because of the change in the extension work format and the fact that it is run by a group of sincere and conscientious staff." The commitment at the field level is crucial.

LINKS WITH RESEARCH

An extension worker can be only as effective as the technology he can offer. The original concept of the NEP provided for closer links between research and extension work and for an improvement in the relevance of the technical packages recommended. But as the findings of the San Carlos study show, these improvements have not yet been fully realized. In general, experience indicates that there is too little contact between SMSs and field technicians. This has the effect that technicians are not getting all the technical advice they need to pass on to farmers, but also that farmers are not able to pass back adequately the difficulties they are having in implementing that advice. The situation in San Carlos was particularly acute. This does not mean, of course, that specialists give no support. The evaluation made in 1980 of the modified system in the first four pilot regions found that a little over half the extension workers had had specialist support. About 94 percent of these had received the assistance during training sessions, and about 53 percent at times when they needed specialist advice. Only about 30 percent, however, mentioned specialists' scheduled visits to the barangays.

Similarly, the experience with the Kabsaka Project shows the need for more support. At present, a core of SMSs provide technicians with the technical recommendations that they will give during the regular visits. Most of the technical information is largely the result of adaptive trials strengthened by five to eight years of experience with the technology package. When the project was expanded in 1980, a component on adaptive trials was set up to refine the package and to supply the specialists with updated and more site-specified technical recommendations. However, the pace of adaptive trials cannot keep up with the demand for technical recommendations required under the T & V system. At the start of a project, stock knowledge can be used. But as more feedback from farmers develops, more site-specific information has to be generated far more quickly than is occurring at the moment.

Of course, all these problems—not only those encountered in the Kabsaka Project, but problems with the delivery of technical packages elsewhere—are aggravated by the fact that the extension is proceeding at a time when research is undergoing structural and organizational changes. Under the NEP, six Technical Bureaus are now attached to the Ministry of Agriculture: the Bureaus of Plant Industry, Animal Industry, Soils, Agricultural Extension, Agricultural Economics, and Cooperatives Development. Their principal function is to provide advice to the Minister and his senior staff on technical and policy matters. The Regional Offices are gradually assuming the former responsibility of the Technical Bureaus for most of the field research at the experimental and service

stations. Eventually, in each region, one Regional Integrated Agricultural Research Center should link work on adaptive trials to application on particular projects. Staff will be drawn from former Technical Bureau staff and will be responsible for undertaking applied research to verify improved technologies developed at the national research center and the universities before the technologies are passed on by extension workers to the farmers. Current difficulties in bringing applied technologies to the rural areas, it is hoped, should be temporary.

To make the system more effective, specific linkages are also being developed:

- Formal ties between extension and the Philippine Council for Agriculture and Resources Research Development, which is attached to the Office of the President and coordinates all agricultural research in the country (links are also being formalized with other research institutions, universities, colleges, and experimental stations)
- Collaboration between SMSs and research institutions and experimental stations
- Feedback by specialists to research
- Proven technology packaged for local application
- Basic and applied research by research institutions and experimental stations
- Adaptive or applied research or verification trials on farmer's fields by the extension service
- Linkage with marketing agencies and other allied services.

TRAINING

The modified T & V system also provides (as the title suggests) for the regular training of farmers, farmer leaders, extension technicians, SMSs, supervisors (Municipal Agricultural Officers and Provincial Office staff) and project management staff. When the NEP was established and the system applied across the nation, a series of orientation programs and seminar-workshops were conducted. These were planned and carried out as part of the application of the modified system in 1979 in the first pilot areas. Subsequently, regional and provincial staff conducted seminars on the improved system. Each extension team in the twelve pilot areas came up with a District Operational Plan in consultation with local officials and extension contact leaders during seminar-workshops on program planning.

Regular meetings with the village and the organization officials were held thereafter to discuss projects and activities based on their prepared program plans. Contact leaders were trained in new techniques and technologies and in attitudes and skills, which they passed on to about ten neighbors in the locality. In the first four pilot areas, 296 contact leaders underwent training in leadership development and technical subjects in 1979, the first year of the NEP.

All levels of extension personnel are regularly trained and retrained on the various aspects of their jobs. Courses cover project implementation management, trainers' development, extension note writing, operation of audiovisual vans, monitoring and evaluation systems, and refresher courses of priority commodity programs of the Ministry of Agriculture (such as Masagana for rice and Maisagana for maize).

These training programs have had positive results. The extension delivery system has improved, as has the performance of field personnel; contact leaders participate more actively; there is more community participation; productivity has increased; and improved technologies are being disseminated more quickly.

However, the Ministry still needs additional personnel to strengthen its training programs in extension delivery. There is still a dearth of instructional materials for the use of extension personnel at all levels. Considering the complex nature of the job expectations of the extension worker, an integrated approach to human resource development also needs to be implemented. There is no doubt that the use of the modified T & V system has laid a great deal of new responsibility on the shoulders of the extension workers. The system requires them to be more organized and committed than they were before, and it demands more of their time and energy. The case study of the Kabsaka Project, for instance, points out: "Since the system was implemented in pilot municipalities, the technicians involved readily observed that they were doing more than the other technicians. Because of the fixed schedules which were disseminated to the farmer groups, there was now a demand for technicians' services. Thus, while other technicians in other municipalities could still afford a lot of flexibility in their schedules, the technicians in the pilot municipalities could not. Hence, staff motivation becomes a problem." Training can help to deal with this issue by presenting extension work in the context of the broader thrust of social development.

MONITORING AND EVALUATION

This is conducted at two levels. At the first, the efficiency of the extension worker is evaluated, according to indicators which show how far his targets have been achieved. Each field technician sets annual targets for each of his activities, based on guidelines he receives from the Ministry via the Regional Offices. His targets are reviewed at the national, regional, provincial, and municipal levels. On the basis of these, the technicians prepare and submit monthly accomplishment reports, using a simplified monitoring form, to the Municipal Agricultural Officers, who consolidate the reports and submit them to the Provincial Agricultural Officer. The latter consolidates all the reports and submits them to the Regional Director, with a copy to the Ministry's Central Monitoring Unit. The lines of reporting are short. The data are then stored at the field, municipal, and provincial levels. Technicians also submit quarterly activity reports.

Field technicians are evaluated three times a year by the Ministry on their achievement of given targets, with weight given for the importance of the activity and the quality of the technician's performance. On the basis of these evaluations, training needs are identified, and allowances, benefits, and promotions are decided.

Monitoring and evaluation is also carried out at the program level. Efficiency is measured according to a program's achievement of its targets—that is, the effects of extension on production, productivity, and the incomes of its clients. As much allowance as possible is made for external effects (climate, disease, credit) on these factors. Three elements contribute to this monitoring process: the performance of all the extension workers, a monthly "situational" report, and regional surveys. The composite is prepared monthly at the provincial level and is passed to the regional and national levels.

CONCLUSIONS

It is not easy to draw lessons from the experience with the modified T & V system in the Philippines. In any circumstance it is difficult to ascribe success to agricultural extension. By its nature, extension is one element in a combination of unpredictable factors that shape the results of farming activities. It is impossible, moreover, to set up control situations that allow an exact comparison between an agricultural undertaking that uses

extension and one that does not. To compound this difficulty, the modified system was introduced simultaneously with the reorganization of the institutions that direct extension activities in the country.

One can, however, point to some signals. On the one hand, there is no doubt that the systematic T & V approach brought cohesion to the existing extension service, and that this cohesion was an important element in the initial success of the pilot projects in the first four regions. It is also clear that the system engaged a great deal of commitment to rural activities at the field level among field technicians as well as farmers. This commitment, perhaps more than anything else, has been the driving force behind such success as the NEP has had so far. On the other hand, it is also evident that research and training are both weak parts of the structure. There is a need for both to become more relevant, more effective, and more closely linked with the activities they are designed to improve. SMSs need to have more and better technical advice to give, to work with farmers in carrying out adaptive trials on their fields, and to relay to the research stations the adaptations farmers suggest.

As the institutional reorganization settles into place, these weak links will become priorities for efforts to improve the application of the modified system. This brief paper has discussed the specific linkages that are to be strengthened. It is likely that more difficulties will arise as time goes on. But as problems develop, so does experience with solving them. In this context, it is hoped that the experience in the Philippines may instruct others using the T & V system elsewhere, as others' experiences are also serving to assist us.

10

Organizing Extension along Training and Visit Lines: Experience in Nepal

R. C. Mishra

In Nepal, reorganization of extension services on the lines of the Training and Visit (T & V) system started as a pilot scheme in March 1975 in two administrative districts (Bara and Parsa) under the Narayani Zone Irrigation Development Project Phase I, assisted by the International Development Association (IDA). The results were found encouraging in the closer contact between farmers and extension agents as well as in the increased production of main cereal grain crops in the area.

In view of this experience, it was decided to reorganize extension services on the same lines in four additional districts under three IDA-assisted irrigation development projects—Rupandehi district, under the Bhairwa-Lumbani Ground Water Development Project; Sunsari and Morang districts, under the S-M Irrigation Development Project; and Rauthat district, an addition under the Narayani Zone Irrigation Development Project Phase II. Thus, by 1979 the extension service in six administrative districts, covering about 240,000 farm families, was reorganized on T & V lines. But no adequate organizational or financial provision was made under these projects to develop adaptive research and to bring about closer linkage between extension and research. Nor were adequate arrangements made to fulfill the increasing demands for additional inputs (fertilizers, seeds, and the like).

THE AGRICULTURAL EXTENSION AND RESEARCH PROJECT

The Agricultural Extension and Research Project under the Ministry of Agriculture and the Department of Agriculture was started in July 1981. It covers eight additional districts of tarai (the southern lowland territory of Nepal adjoining the Gangetic plain). The total area covered by this project is about 13,824 square kilometers (40 percent of the gross area of the tarai). The population is 1.74 million (1971 census), with 362,741 farm families. The total cultivated area is 478,800 hectares. The average size of holding in the project area is 1.3 hectares. The project objectives are to reorganize and strengthen the agricultural extension service and to upgrade and develop adaptive research in eight administrative districts of tarai—with the overall goal of achieving early and sustained improvement in agricultural production, particularly of food grains. These improvements in production would largely be brought about by providing farmers, on a regular and systematic basis, with up-to-date advice on farming practices (with emphasis on low-cost, labor-intensive practices and use of appropriate levels of fertilizers). This information would be relayed during strictly programmed visits from regularly trained field staff supported by professional advice from extension and research staff of the Department of Agriculture.

The project has been framed for a period of five years and comprises:

- Reorganization and strengthening of agricultural extension services; provision of additional staff, housing, offices, equipment, transport, and staff training designed to consolidate the reorganization
- Strengthening and reorientation of applied and adaptive research; development and upgrading of four regional research stations and one substation; and provision of staff, machinery, equipment, laboratory facilities, and vehicles
- Project monitoring and evaluation; establishment of regular monitoring and evaluation procedures
- Technical assistance; overseas training of project staff and provision of consultants; and provision of 22,100 tons fertilizer to be used in project districts.

Extension coverage of the eight districts has been phased over a period of three years. The two districts, Jhapa in the Eastern Region and Nawalparasi in the Western Region, have been included in the first year; three districts, Chitwan in the Central Region, Kapilvastu in the Western Region, and Banke in the far Western Region, have been included in the second year; and Dhanusha, Mahottari, and Sarlahi in the Central Region are expected to be included in the third year.

The total cost of project implementation is estimated to be 250.60 million Nepali rupees (NRs) (US\$20.85 million), which includes US\$17.50 million (84 percent) as IDA credit and US\$0.65 million (3 percent) as technical assistance from the UNDP.

CURRENT STATUS OF THE PROJECT

Although the project became effective in July 1981, actual implementation started November 1981 after a full-time coordinator was appointed. According to the implementation schedule, two districts—Jhapa and Nawalparasi—were included in the first year's extension coverage and three districts—Chitwan, Kapilvastu, and Banke—have been included since July 1982. Adaptive research and other development activities in four Regional Research Stations and one substation started in the first year of project implementation. All required numbers of village Panchayat-level Agricultural Assistants (PLAAs, or Village Extension Workers, VEWs, in Nepal; a panchayat is the village administrative and development unit) in two districts (thirty-six for Jhapa and fifty-one for Nawalparasi) have been appointed, initial training has been completed, and these personnel have been working explicitly along the lines of the T & V system since the end of 1981. Appointments of mid-level staff (Junior Technical Assistants, JTAs [Agricultural Extension Officers, or AEOs, in Nepal], and Junior Technicians, JTs) for the first year's two districts in the required number (thirty-six JTAs and seventeen JTs in total) were completed. These staff were given orientation training and have also worked since the end of 1981.

Subject Matter Specialists (SMSs; two for each district), one Assistant Agricultural Development Officer (AADO) and one Agricultural Development Officer (ADO) for each of the two districts have also been recruited. Thus, all staffing requirements of two districts have been fulfilled and reorganization of extension service on T & V lines has been done. Regular fortnightly training of the field staff and programmed visits by field staff to farmers have continued since 1981 in the two districts.

In the three additional districts included since July 1982, selection of PLAAs and their initial training are going on. The required numbers of mid-level staff (in total forty-eight

JTAs and sixteen JTs) for the three districts have already been recruited. Posts have been created for the required numbers of SMSs and ADOs, and their appointments are in process. A two-day orientation training course on the T & V system has been conducted for all existing officers of the three districts.

In Regional Research Stations, appointment of the required numbers of additional mid-level staff (three JTAs and two JTs) and officer-level specialists (two specialists up to Gazetted Class III; "Gazetted Class" refers to senior civil servants whose names are published in the Government Gazette) are complete as scheduled for the first year. Because of administrative problems, appointments of senior specialist-level (Gazetted Class II and Class I) staff are still in process. The posts required for the second year of implementation of the project are sanctioned, and appointments are in process. Efforts are being made to create a closer linkage between extension and research. Districtwide bimonthly meetings between extension and research workers to discuss recommended technology for the next four fortnightly training sessions, and six-monthly workshops at each Regional Research Station to discuss technologies for the coming crop season and to plan research activities, are regularly conducted. Adaptive trials suited to solving local problems are conducted both at the research stations and at farmers' fields.

Establishment of two Regional Training Centers (one at Bhairwa and another at Nepalganj) is in progress. Appointment of the required numbers of specialists and mid-level staff (two Training Officers, four JTs, two artists, and so on) for the two centers have been made. Construction of buildings and procurement of sophisticated equipment will take some time. But the Regional Training Centers have started functioning with existing facilities and supports. Preservice training of village-level workers and in-service training of mid- and low-level field staff are conducted with the required frequency at these training centers.

The benchmark study of the two districts, which came in the first year of implementation, is complete. For the next three districts, arrangements are being made to get the studies conducted.

Procurement of some urgently needed vehicles and equipment is completed for the two districts; for the others the process is in progress. Construction of buildings and farm development works have not yet been started. The designs and estimates are in their final stage. It is expected that the construction work will start soon.

FARMERS' REACTION TO AND PARTICIPATION IN THE T & V SYSTEM

Each district is divided into several village panchayats, generally on the basis of population and geographical make up. The number of farm families per panchayat varies from approximately 500 to 1,000. Each panchayat is divided into nine wards. Unavailability of sufficient number of formally trained VEWs (JTAs) led us to select from each panchayat one middle-aged practicing farmer with about eight years of schooling to work as village extension agent, or PLAA. After selection, the PLAAs are given four weeks of preservice training in general farming practices for different crops grown in the area. They live in their own panchayats and get a remuneration of NRs150 a month for working as full-time extension agents for the panchayats. The PLAA visits each of the nine wards of the panchayat on a fixed day, once a fortnight, according to a fixed schedule. In each ward, by mutual discussion with ward farmers, the PLAA designates eight to ten contact farmers. Out of twelve working days in a fortnight, the PLAA spends nine days visiting nine wards, one fixed day in a fortnight getting fortnightly training lessons at the subcenter, one day having a meeting with the JTA concerned, and one working day as an

optional day for covering any missed visit or doing any other necessary work. While visiting the ward, the PLAA tries to meet as many contact farmers as possible in the fields or at home and delivers to them the message he has learned during the last fortnightly training session. He also tries to help the contact and other farmers to put the message into practice in their fields. Very often he also organizes meetings of contact and other farmers to discuss common problems or to deliver and demonstrate messages common to all. The PLAAs also conduct demonstrations of "mini-kits" (small packets containing improved seed and other production inputs such as fertilizers and insecticides) and help higher-level field staff in conducting demonstrations, field trials, farmer tours, and the like.

A JTA is posted in every three to five panchayats to supervise and help the PLAAs. In addition, the JTAs also conduct demonstrations, farmer tours, and field days and organize meetings, exhibitions, and so forth. For every ten to fifteen panchayats, a subcenter is established where a JT is posted. Each JT supervises and helps the JTAs and PLAAs in his area. He also helps the SMS in organizing fortnightly training sessions and in conducting field trials, production demonstrations, and the like. JTs and JTAs submit monthly programs of their work before the beginning of the month and proceed accordingly. Two SMSs (one for crop production and the other for plant protection), posted at the district level, are responsible for conducting fortnightly training sessions at each subcenter, conducting precrop training of field staff, conducting field trials and collecting trial data, planning and supervising demonstrations, and giving follow-up visits to field staff. The ADO at the district level is overall organizer, coordinator, and supervisor of all extension activities and is aided by an AADO.

Farmers' participation in the T & V project is much better in 1982 than before. Because of the increase in the number of field workers and their systematic working pattern, the contact between farmers and extension agents has increased considerably. Some positive effects are also visible as the demand for inputs (improved seeds, insecticides, fertilizers) has increased compared with 1981. But the regularity of visits by PLAAs has not yet been properly maintained; the extent has depended on the frequency of supervision by higher-level staff. The incentives given to the PLAAs—monthly remuneration of NRs150—is also perhaps not sufficient for full-time work. The extent to which farmers have adopted the message delivered by PLAAs is also not very satisfactory. Farmers tend to be very reluctant to change their traditional farm management practices; hence, messages of low-cost or no-cost techniques for better farm management are not adopted easily. Instead, adoption is comparatively better if some new crops (for example, summer pulse, green manure crop) or fertilizers are timely supplied in required quantity. Because of some heterogeneity in farm practices (even under homogeneous climatic and other conditions), the message delivered by field staff is often not relevant to the present needs, or is not suitable to the individual farmer's circumstance and capability, and hence is not adopted at all.

TECHNICAL RECOMMENDATIONS AND LINKAGE WITH RESEARCH

Basic research is conducted in Nepal at Crop Development Centers (on rice, wheat, maize, oilseeds) and at the Central Research Divisions in Kathmandu. Rice, wheat, maize and oilseed development centers are in the project area itself. The Rice Development Center and the Wheat Development Center also function as Regional Research Centers of their respective regions for conducting adaptive research. In addition, in the remaining two regions two Regional Research Centers are responsible mainly for adaptive research work. The Crop Development Program Centers and Technical Divisions at the central level

identify and select new varieties and identify appropriate farming practices. These varieties and practices are tested at Regional Research Center farms and on farmers' fields. The extension workers (specially SMSs, JTs, and JTAs) help in carrying out the adaptive trials on farmers' fields and in collecting data. The varieties which give satisfactory results in adaptive trials are released by the Varietal Release Committee at the central level. Similarly promising practices are recommended by concerned Crop Development Centers and Technical Divisions.

Strengthening linkage between extension and research is attempted in the T & V project area through Central and District Technical Committees and regional workshops. District Technical Committees, which convene twice a year, bring to the regional workshops problems and proposals for recommendation that are based on the district field trial experiences. The regional workshops are conducted twice a year at Regional Research Centers, where proposals and problems received from the districts are discussed. During the regional workshops, final draft proposals of recommendations are discussed and forwarded to the Central Technical Committee for review and approval. At the same time in the workshops, research programs are planned for local research workers to solve local problems. The recommendations approved by the Central Technical Committee are discussed in the bimonthly training sessions held at research centers and district farms. In the bimonthly training meetings, district-level extension officers (including SMSs) and research staff participate. On the basis of the approved recommendations, they formulate lesson plans for the coming four fortnightly training sessions of field extension workers.

Through the District Technical Committees, regional workshops and bimonthly training meeting sessions have started operating only in the last months of 1982. These attempts are establishing much better communication links and are functioning to bring extension and research workers much closer together to identify local problems and to make joint attempts to find solutions. Lack of expertise and lack of adequate research facilities at field level are bottlenecks to developing satisfactory local research activities in the near future, but the attempts made in the framework of the project will definitely bring better achievements.

PLANNING AND IMPLEMENTATION OF THE TRAINING PROGRAM

The PLAAs in general have eight years of formal education and are given one month's preservice training, mainly in cultivation practices, by the project at the Regional Training Centers or at the Regional Research Stations. They are then appointed on a yearly contract basis. Besides fortnightly training, they are given six-monthly refresher courses in the project by SMSs. Some special training courses at Regional Training Centers are also occasionally conducted for them. After completing high school, JTAs receive one year, and JTs receive two years, of formal training at the Agricultural Institute before joining the service. On the basis of their educational background, service experiences, and work performances, JTAs and JTs have opportunities to get promoted to a higher level and to get a stipend for long-term training courses and bachelor-level studies. But as the number of JTAs and JTs increases, competition is getting tough. In the project the JTs and JTAs, besides receiving fortnightly training, get six-monthly refresher courses by SMSs. They also receive occasional special refresher courses organized by the Department of Agriculture at Regional Research Centers and Regional Training Centers.

SMSs and AADOs are mostly new university graduates. ADOs generally hold master degrees and have several years of experience. There are opportunities for them to get

promotions and to get stipends for higher studies. Although the new graduates, in the beginning, are temporarily appointed on a six-monthly basis or for a project period, they gradually get permanent appointments either within or outside the project. The refresher courses for officers are conducted through bimonthly training meetings at the Regional Training Centers and through six-monthly workshops at the Regional Research Stations in the project area. Besides these, the Department of Agriculture occasionally organizes workshops and training courses for them.

The need for better training is felt by all levels of field staff. The quality of the training courses conducted is not satisfactory to meet demands. Lack of expert trainers, lack of sincerity in executing the training program (probably due to the lack of attractive incentives), and lack of training facilities are some of the serious hindrances. The project is making efforts to improve the situation and has achieved considerable success in the quantitative aspects of training. But it seems that some of the problems, mostly qualitative, will be difficult to solve until special arrangements are made.

IMPLEMENTATION AND SYSTEM MAINTENANCE

Of the eight districts to be included in the project, the program has started functioning in two and has been introduced in an additional three. The remaining three districts will be added in 1983. Staff commitment to the system in some cases is not satisfactory, but in others it is. Sincere and diligent efforts are needed from all levels of staff to make the system work efficiently. But few additional incentives are given that are commensurate with the additional efforts expected and needed for efficient implementation of the system. Insufficient incentives do not encourage motivation; hence, irregularities in visits and supervision and insufficient efforts to develop the quality of visits, guidance, supervision, and training are not uncommon. There is no proper evaluation system developed to measure staff performance. To provide proper rewards to good workers and proper penalties to insincere workers is mostly not within the authority of immediate supervisors. So the efforts of supervisors in this direction often take long to get any success or are in vain, and gradually the supervisors stop thinking of taking further steps. Sincere and diligent workers, even on marginal incentives, are contributing better than in past years, but insincere and less diligent workers think that the system is dragging them along to contribute more. Hence, comments like "the system is mechanized," "computerized" are frequently heard—even from a few staff working within the system, but mostly from those outsiders who have not fully understood or experienced the workings of the system themselves.

The cost of implementing the system is definitely higher than that of the traditional system of extension. In my experience the output is also higher than that of the traditional system. But no scientific evaluation system has been developed yet to show in a clear-cut way that the achievements are due to implementing the T & V system. Until this is done, it will be very difficult to give to policy decisionmakers factual justifications for maintaining the system without external assistance.

MONITORING AND EVALUATION

In the beginning of the first year of implementation of the T & V system in each district, a benchmark survey is conducted. After this, internal monitoring studies are also conducted from time to time by the project. Monthly reporting systems for progress made

and financial expenditures incurred are maintained by the project. The Marketing Service Department collects, on a seasonal basis and by random interviews and crop-cutting surveys, information on areas covered under different crops and on yields of different crops. But a scientific, elaborate monitoring and evaluation procedure for the T & V system and its achievements has not been developed. This is urgently needed. Some steps have been taken to develop a "procedure," but it has not yet taken any satisfactory shape.

CONCLUSIONS

The T & V project in Nepal has been implemented since November 1981—only a year (at the time of this workshop). In two of the eight districts in this project, the reorganization of extension service on the lines of the T & V system has taken shape. In three other districts, which have been included in the project since July 1982, the reorganization is in progress. The remaining three districts will be included in 1983. Organized procedures have started functioning to bring about better linkage between extension and research. Required training programs are being run under existing facilities, and necessary efforts are being made to develop facilities in training centers. It is realized that the T & V system considerably increases contacts between farmers and extension agents. A planned approach to develop agriculture through this system is appreciated. There are some indications that the T & V system, if properly implemented, can be effective in increasing output (yield). But the output through implementing the system would be much higher if there could be better commitments at all levels; if the system could be allowed to continue undisturbed for some years; if proper incentives could be given to the staff for additional efforts; if the reward and penalty performance system could be properly developed, organized, and delegated; and if proper arrangements could be made to develop the quality of staff working in the system. Over and above these qualifications, a well-developed evaluation system is essential to measure clear-cut achievements from implementing the T & V system.

Management's Role in Training and Visit Extension: A Comment

Michael Baxter

Management has a central role in the Training and Visit (T & V) system of extension, and good management is vital to the system's success and impact. To be effective, extension requires an appropriate organizational structure and, within that, efficient use of resources. The organizational structure involves not only the extension service, but also its links with supporting activities such as agricultural research, input supply, marketing, credit, and other rural and agricultural development agencies. Effective management is also required to ensure that extension takes on the necessary diagnostic and agent-of-change roles. Many roles and responsibilities of management—at both the systemwide and individual levels—are brought out in the keynote papers by Vorasak Pakdee (chapter 8), Francisco Rentutar and Romeo Aquino (chapter 9), and R. C. Mishra (chapter 10). I shall expand and comment on a number of these.

THE INITIAL ROLE OF MANAGEMENT

When the T & V system is initially adopted, attention is usually (and rightly) focused on the organization of the basic extension framework: the selection and orientation of staff; establishment of Village Extension Worker (VEW) circles and Agricultural Extension Officer (AEO) ranges; delineation of farmers' groups and selection of contact farmers; drawing up of visit and work programs for all officers; scheduling and organization of fortnightly training sessions, monthly workshops, and zonal extension-research committees; formulation of the production recommendations and "impact points"; and so on. These organizational activities all take time. Further effort is required over the first year's operation to adjust these basic elements of T & V extension in light of field experience to ensure that each element works both individually and synergistically to result in useful production recommendations to be taught to and adopted by farmers and in the establishment of the requisite feedback function of extension.

During the preparation for and early implementation of a professional extension system when attention is on such operational details, the broader ramifications of the introduction of the reformed extension system may be recognized only gradually. An early sign of this recognition may be indications that the objectives and activities of some programs of the Department of Agriculture and the reformed extension system are not synchronized. For example, farm-level input or subsidy distribution activities may require staff involvement and work scheduling at odds with the requirements of the T & V system. Administrative constraints on staff travel or the heavy involvement of staff in meetings may be contradictory to the requirements of the extension system. Similarly, the degree of planning and coordination necessary to ensure that appropriate recommendations are developed for timely transmission to farmers, with appropriate support from agricultural research and input supply and marketing organizations, may be evident only gradually.

All three keynote papers on management and system maintenance, but particularly that of Vorasak, mention a range of administrative and other constraints to the introduction of the reformed extension system. Adjustments may be made (for example, in recruitment procedures, training activities and objectives, travel policies and allowances, supervision methods, and links with research and input organizations) to rectify such difficulties as operational requirements dictate. Such measures are, however, often reactions to operational constraints rather than part of a coherent management strategy.

CRITICAL AREAS OF INTERVENTION

There are three main areas in which effective management intervention is required to establish and maintain productive T & V extension. The basic framework and operation of the extension system is the first and perhaps most obvious of the three, and it is that which normally gets the most attention. The delineation of areas of jurisdiction and the establishment and following of visit and training schedules are examples of such elements, which in effect constitute a minimal required organization for the T & V system. A second and on-going concern is to ascertain that there is the necessary support to ensure that the basic system operates effectively. This will include, for example, the orientation of associated staff, development of understanding of and commitment to the system among senior-level staff (both within and outside the Department of Agriculture), establishment of supportive travel policies and allowances, and creation and maintenance of an incentive structure appropriate for the work involved in a professional extension system. Third is coordination with agricultural research universities and agricultural development and other support activities, including the media. This is a critical area: just as extension is by no means the only initiative required for increasing agricultural production, so does the effective operation of any extension system (and no less T & V) depend on support from and coordination with a range of activities external to the extension service, external even to the Department of Agriculture. Management at all levels must ensure that the needed support and coordination is established and maintained both through formal meetings and informally. Otherwise, extension staff work in isolation and consequently have little impact.

Effective management attention to these three areas will normally result in an extension system that operates well, brings farmers' production conditions and constraints to the attention of research and government, and teaches farmers appropriate productive technology. While these achievements are substantial, given innovative and forward-looking management, the potential impact of the T & V system is even greater. This is because adoption of a professional agricultural extension system has ramifications for the policies, planning procedures, activities, and structure of the Department of Agriculture itself, as well as for all other agricultural development activities. Vorasak's paper on experience in Thailand highlights many of these ramifications. Some of these implications are discussed below. The point to be noted here is that awareness of the broad implications of professional extension may develop only gradually within extension management. But unless management specifically recognizes these implications and attempts to handle them in a systematic and comprehensive fashion, the full potential of the system is unlikely to be realized.

Incentives to improve performance

A prime concern of management is to maintain staff interest and activity once the basic extension system is established. This has been highlighted by Mishra as a major concern in Nepal. Many extension staff, especially those resident in the field such as VEWs and

AEOs, live and work under arduous conditions. Unless this is acknowledged by extension management and there are appropriate incentives or rewards, it is extremely difficult to maintain the staff interest and commitment that are necessary for effective extension. Because extension is a service activity (and therefore is staff oriented rather than capital investment directed), government efforts at economy are frequently focused on it, as Vorasak mentions with reference to Thailand. An extension system cannot be exempt from such forces, but it is important to make allowance for the particular conditions under which extension workers operate—and need to operate to be effective—and to ensure that working under such conditions is rewarded so that the dynamism of extension field staff is maintained.

Incentives are important not only to encourage active field work. They are also needed to develop leadership and innovation. Extension organized on T & V lines is dependent on strong leadership. At each administrative level, leaders must be able and encouraged to make decisions that will lead to effective, diagnostic extension work. Staff of all levels must be given recognition for their work where it is due. While prizes and awards can boost staff interest and application, there can be no substitute for an objective staff recruitment, remuneration, and career development structure as an incentive for staff performance (although such a structure must of course be complemented by the technological support necessary for staff to operate effectively, including among other things useful messages to teach farmers).

Field supervision

The establishment of appropriate work and supervision procedures is an area where management must make a considerable contribution. One of the basic organizational principles of the T & V system is that the focus of all extension activities must be farmers and their fields. The prime objective of extension is to increase farmers' production, income, or both. The efforts of all extension staff are directed to strengthening the VEW's ability to transfer technology to farmers and to have them adopt it. The extent to which this is achieved can be checked only in the fields of farmers. This is not to say that the VEW alone is responsible for the success (or shortcomings) of the extension system. Indeed, if the farmer is not taught relevant messages, the weak point is as likely to be the quality of work of the VEW's supervisors, the technical support given to him by Subject Matter Specialists (SMSs), or the training system as it is the VEW himself.

If the extension system operates well in the field, then one may assume that other aspects of it also work. Yet indications of poor operation in the field often point directly to weak aspects of the system elsewhere. For example, irregular visits by VEWs or a poor record of adoption of recommendations by farmers suggest that supervision by AEOs (and consequently by Subdivisional and District Extension Officers) is lacking. Similarly, if farmers do not adopt recommendations they have learned from VEWs, one will frequently find problems in feedback from extension workers to research or in research not taking full cognizance of farmers' production constraints and their technological needs and priorities. Training sessions are supervised largely in the sessions themselves, but the ultimate test of training—particularly, but not only, of fortnightly training sessions and monthly workshops—is whether the messages taught in training are known and adopted by farmers. It is management's responsibility to develop and implement supervision procedures that can identify in the field constraints to effective extension and the aspects of the extension system that need attention to overcome these constraints.

DIVERSIFICATION

The extension system when first organized on T & V lines concentrates on crop production, and within this on major recommendations for the main crops of the farmers

of each VEW. Over time, attention is given to other important crops, particularly as research support develops. Extension should ultimately deal with most farm-based production activities because the farmer himself invariably treats his farm activities as an integrated unit: decisions concerning crops are often related to considerations of livestock operations, and so on. Animal husbandry, farm forestry and fisheries, horticulture, and soil and water management are common aspects of many farming systems for which farmers require extension support.

Although various input-related activities in other farm-based areas should remain the responsibility of the respective departments, general extension should be done by the one agricultural extension service (although this one service may have specialized divisions as agricultural specialization and sophistication warrant). The chief requirements of other involved departments are to designate staff to act as SMSs for extension and to ensure that the technology taught to farmers by extension workers is coordinated with the other activities and advice of the particular specialized department. While accepting the need for it to become involved in all or most farm-based activities, the extent and pace at which the extension service does this depends on its staff resources (field crops must remain the focus) and the technical support supplied by other departments. (Often, some of these areas are within the jurisdiction of government departments other than the Department of Agriculture, and so coordination may be difficult.) Extension management must, however, take the lead in seeking the support of allied departments in broadening the base of extension activities to better suit the needs of farmers.

OTHER IMPLICATIONS

The introduction of T & V extension has other implications far beyond what the mere adoption of a new system of extension might suggest. The way in which these are handled by management has a major bearing on the long-term contribution of extension to agricultural development. Four such areas may be noted as examples.

Farmer participation

One area is farmer participation in the program planning and general implementation of extension and agricultural development. The attention of extension and research alike often focuses on the messages that extension is to advise and teach farmers. This emphasis, however, overlooks a prerequisite of extension: involvement of farmers in identifying areas where they require technological assistance and in evaluating the production technology recommended by research. Through the VEW—via AEOs and SMSs, fortnightly training sessions, and monthly and seasonal zonal workshops—there is a direct link between farmers, extension, researchers, and agriculture policymakers. Building up and maintaining this channel should be a priority of extension staff at all levels.

Another aspect of farmer participation—and one that is possibly unique to the T & V system—is the role farmers can play in supervising extension staff. The VEW's fixed visit schedule is known to the farmers of all groups in his circle. Farmers know that the VEW has no other responsibility on that day except to visit the scheduled group and to meet contact and other farmers in their fields. If farmers also know the VEW's supervisors (in particular, the AEO and Subdivisional Extension Officer), they can become a significant force in supervising the work of extension staff, who after all are employed to work for them. In Nepal, as Mishra notes, some farmers themselves work as VEWs (that is, as

Panchayat-level Agricultural Assistants, PLAAs), another possible aspect of farmer participation in the extension system.

The Department of Agriculture

A second implication of T & V extension is the consequences of professional extension for the activities and organization of the Department of Agriculture. The introduction of the T & V system is predicated on the principle of making best use of available resources. At the least, this normally involves the reorganization of staff resources and some programs, but this reorganization is never as extensive as it can or should be. Areas where further change may be needed to remove duplicate activities and to strengthen and take advantage of extension include: staff positions and responsibilities; crop development programs (particularly those involving farm-level subsidies); reporting formats and requirements; meetings, farmer training, and media support; and even the structure of the department itself (including, for example, decentralization of decisionmaking and planning).

The need for many of these changes will be apparent to extension management. Other suggestions will come from extension staff at different levels. Staff are likely to push for an improved remuneration and incentive structure, closer and more effective links between extension and research, additional resources for training, greater support of input supply and agricultural marketing activities by the appropriate organizations, and better coordination with the programs and activities of other development departments. On the one hand, management's failure to address these issues will have negative consequences for extension. On the other hand, overcoming them will contribute to significant overall strengthening of the extension system rather than result only in better working conditions for staff.

Other government departments

A third implication of the introduction of extension reform is its consequences for other government departments and development work. Some of the organization and training principles of T & V extension—such as staff having realistic, defined tasks for which they are accountable—are applicable to any other organized development effort. Agricultural input services (including credit), other departments whose work supports farm-based production activities, and possibly even such fields as primary health care—all are areas for which such principles have relevance.

Farmer-extension-research relations

A fourth implication of the adoption of professional extension that may not be immediately apparent is change in the relations between farmers, extension, and research. The frequent, regular exposure of farmers to extension and the feedback from farmers to extension and research enabled by, and required of, the T & V system often put extension, research, and the farmer in relations to each other that are different from those existing before the adoption of professional extension. Extension staff become virtual partners of researchers: it is extension staff who ensure that farmers' production conditions and constraints are known by researchers and are taken into account in setting research objectives and programs; who study existing production systems; and who help select research objectives, participate in farm trials, and assist in the formulation of production recommendations to be taught to farmers. Without this support,

research is not likely to serve extension well or to meet farmers' needs. Unless extension performs these functions, it is failing in one of its main responsibilities: to ensure that there is meaningful feedback between farmers and research. Each of the three keynote papers on management and system maintenance mentions the positive impact on research and research-extension linkage of the reformed extension system.

The impact of agricultural extension is evaluated by its effect on farmers, the intended beneficiaries. At the same time, however, the broader ramifications of professional extension must also be taken into account. Some Departments of Agriculture have found that the introduction of T & V extension has had a positive impact on staff morale and effectiveness not only in the extension service but throughout the department. Consequences of the adoption of professional extension on farmer participation, on the Department of Agriculture's organization, activities, and effectiveness, on other development activities, and on agricultural research, for example, should be evaluated even if such broader consequences were not explicit among the reasons for adopting the T & V system.

FLEXIBILITY AND INNOVATION

The T & V extension system provides extension management—and ultimately the Department of Agriculture—with a powerful tool, not just for more effective extension, but also for strengthening the effectiveness of the department in the broadest sense. This result is most likely to happen if extension management recognizes the potential of the system and deliberately innovates and experiments within the framework of the introduced system. There are certain basic features of T & V extension that cannot be altered without adversely affecting its actual and potential impact. These, however, are general principles (such as regular visits and contact with farmers, relevant production messages, regular training, and so on) rather than specific operational details. There is much opportunity for adjustment of the system to suit local conditions, and this flexibility must be used. Particular attention should be paid to local agroclimatic, socioeconomic, and administrative conditions and to local development priorities, including those expressed by farmers and reported through the extension system. There is latitude to innovate within established parameters, and unless such innovation and adjustment to local conditions take place, the system is unlikely to have more than minimal impact.

Although there is a significant need for innovative, active management—both to have the basic extension system work satisfactorily and, more important, to ensure that over time appropriate advantage is taken of the system—such managerial capacity often develops slowly. One reason for this slow development is that considerable time and effort are required solely to establish and maintain the basic T & V system, even where all involved departments and staff are fully cooperating—and even though management is innovative and active.

A number of reasons are often given by extension management for limited innovation in extension activities; as both Mishra and Vorasak mention, these include administrative constraints, “lack of support and understanding,” and an absence of incentives. None of these is usually insurmountable, however, and extension or Department of Agriculture management itself often has some authority to overcome these obstacles. Commonly cited constraints include frequent meetings, heavy reporting requirements, and numerous input-oriented agricultural development schemes that divert staff from extension. It is not uncommon, however, for at least some of these constraints to be generated by the Department of Agriculture itself. While extension management may complain of inadequate support and understanding, often it has not made concerted, systematic efforts

targeted at the right level to overcome these problems. Similarly, extension management is sometimes tardy in proposing realistic steps to improve the incentive structure of its own staff.

Significant constraints to innovation do exist, and extension management has frequently made considerable efforts to overcome them. But much more needs to be done. Extension management itself should take the lead in identifying constraints to effective extension, in overcoming those constraints within its purview, and in seeking appropriate assistance to resolve others. Most extension services that have adopted T & V methods are generally too easily satisfied with the basic system. Farmers, extension staff, researchers, and officers of other involved organizations must be forced by extension management to consider the effectiveness of the extension service (and of their support for extension) and to make suggestions for improvement. The extension service must actively publicize its achievements so that its sense of success is shared by the Department of Agriculture, the government in general, and the public. Unless the sense of organizational activity and concrete field results that are experienced by extension services with the adoption of the T & V system are accurately and widely spread, government support vital for further development of extension is likely to be limited and slow.

CONCLUSIONS

The T & V system of agricultural extension is basically a system of management designed to meet a specific set of operational conditions. To do so, it uses a number of established managerial practices, though combining them to form a unique system. It is a tool that is intended and has proven to have a significant impact on agricultural production. The T & V system of extension alone, however, will not result in good extension work. Like any system, it cannot operate without good management, which must involve strong, innovative leadership. Effective management is particularly important for T & V extension. Once the basic system is operating, its greatest impact will come from management that continuously adapts T & V methods to operate more effectively in local conditions, coordinates with the required support organizations, and takes maximum advantage of the broad ramifications of the system.

Monitoring and Evaluation

Monitoring and Evaluation of Extension: Experience in Thailand

Adisak Sreensunpagit

This paper discusses the experience accumulated in Thailand with the monitoring and evaluation of the national Training and Visit (T & V) extension system. The paper first describes the organizational structure of the Monitoring and Evaluation Unit (MEU), next outlines the methodology employed in monitoring and evaluation, and then summarizes some of the specific studies carried out by the unit.

The two main forms of monitoring and evaluation are the surveys carried out periodically for both monitoring and impact evaluation purposes, and the in-depth sociological case studies on special topics. Each is described in some detail, and several findings generated by these studies are summarized. A brief discussion follows on the project management's use of monitoring and evaluation findings. Finally, some of the difficulties encountered are also highlighted.

Several recommendations on how to improve future monitoring and evaluation activities in Thailand are suggested in the concluding section.

BACKGROUND

Thailand's extension system is organized under the Department of Agricultural Extension (DAE) in the Ministry of Agriculture and Cooperatives (MOAC). From the outset, DAE's overall responsibility has been to provide extension services that will help farmers increase yields. As in other countries, the ultimate goal of these services is to raise farmers' standard of living and to develop the national economy.

DAE began its operations in 1967 [for additional background information, see chapter 8]. For the next decade, the staff continued its efforts to administer extension services despite adverse conditions. One major problem was a lack of facilities (office space, transport, equipment, and so on). Extension activities were poorly organized and lacked coordination with research. This made necessary the reorganization of the DAE in 1975, with a view to improving the overall extension program.

In 1977, DAE initiated the National Agricultural Extension Project (NAEP) I, assisted by the World Bank. This project aimed to strengthen and expand the services of the DAE to millions of farmers, with a strong emphasis on reaching poorer small cultivators and on expanding services to all provinces of the nation.

Currently DAE is organized in two main parts: the headquarters and the field offices [see the organization chart, figure 8-2, in chapter 8]. Headquarters has a staff of 1,545 who work in nine divisions and six regional offices. The field offices have a staff of 9,091 who work in seventy-two provincial extension offices that are located throughout the nation. In total, the staff of the DAE has grown from about 1,730 in 1970 to 10,865 in 1982. The major increases occurred in 1976 and 1977 and subsequently after the start of NAEP.

Table 12-1. Department of Agricultural Extension (DAE) Staff and Budget, Thailand, 1970-82

Fiscal year	Staffing			Budgeting (million baht)		
	Number	Percent increase from 1970	Percent increase annually	Amount	Percent increase from 1970	Percent increase annually
1970	1,732	—	1.2	96.0	—	—
1971	2,202	27.1	27.1	130.2	35.6	35.6
1972	2,202	27.1	0.0	123.0	28.1	-5.5
1973	2,231	28.8	1.3	143.6	49.6	16.7
1974	2,231	28.8	0.0	157.0	63.5	9.3
1975	2,384	37.6	6.9	237.4	147.3	51.2
1976	5,455	215.0	128.8	285.2	197.1	20.1
1977 ^a	6,673	285.3	22.3	402.9	319.7	41.3
1978	7,579	337.6	13.6	480.6	400.6	19.3
1979	8,416	385.9	11.0	535.6	457.9	11.4
1980	9,122	426.7	8.4	764.8	696.7	42.8
1981	10,397	500.3	14.0	913.3	851.4	19.4
1982	10,865	527.3	4.5	1,002.6	944.4	9.8

— Not applicable.

Sources: Division of Personnel and Division of Planning and Special Projects, DAE.

a. First year of the National Agricultural Extension Project (NAEP).

Detailed figures about extension staff increases are given in table 12-1; the distribution of this staff by levels of employment in 1982 is reflected in table 12-2.

The budget of the DAE, accordingly, increased sharply over the same period, particularly since 1977 when NAEP was introduced. The total budget was 130 million baht (B) in 1971, B285 million in 1976, and B1,002.6 million in fiscal year 1982 (see detailed yearly breakdown in table 12-1).

To implement its program under NAEP, the DAE adopted the T & V system, by which it hoped to maintain regular training of extension agents and steady contact with farmers. The contact leaders in the rural communities were selected systematically at a ratio of 10 percent of the total number of farm families, at about 1,000 farm families per agent. Field supervision, various work facilities, and coordinating lines have been instituted to support the T & V system.

In 1979, the initial extension project was expanded to cover the remaining thirty-nine provinces, thus making the project nationwide. The total project costs have been estimated at US\$59.5 million for NAEP I and US\$80 million for NAEP II.

Table 12-2. DAE Staff in 1982 by Level of Employment

Office	Position classification (P.C.)			Total
	7-10	5-6	1-4	
Headquarters	46	172	1,296	1,514
Within nine divisions	30	109	770	909
Within six regional offices	16	63	526	605
Provincial-district offices	65	529	8,497	9,091
Total	111	701	9,793	10,605

Source: Personnel Division, DAE (March 31, 1982).

THE MONITORING AND EVALUATION UNIT

From 1967 to 1975, monitoring and evaluation activities were implemented only rarely in Thailand, and they were located under the DAE Secretary's office. With the DAE's reorganization in 1975, monitoring and evaluation activities were transferred to the Planning and Special Projects Division of DAE. Overall, feedback to management was limited. Information on extension performance used to come from only two principal sources: reports from officials stationed in the field, and reports from inspectors or headquarters administrators visiting various project areas. Finally, in 1978 the MEU, which consisted of one permanent and two temporary employees, was assigned the task of monitoring and evaluating extension activities for NAEP.

The MEU received assistance and advice from an Australian consultant, Denis Fardy, in setting up the monitoring and evaluation system. The major purpose of the monitoring and evaluation system is "to assess the actual operations and effectiveness of the NAEP." Specifically, the MEU was given the responsibility (1) to monitor allocation and utilization of resources and implementation of extension projects, (2) to measure changes that have occurred as a result of project efforts, and (3) to recommend more appropriate extension strategies. In addition, the MEU has encouraged other DAE units to carry out their own monitoring and evaluation and has supported these efforts. A summary of MEU activities during 1977-81 is presented in table 12-3.

Organizational structure

The MEU is divided into six sections on the basis of function: (1) surveying, (2) data processing, (3) analysis and reporting, (4) monitoring, (5) research, and (6) support and development. The first three sections are jointly responsible for the so-called impact evaluation, which involves measuring changes that can be related to the activities of NAEP. The fourth and fifth sections are responsible, respectively, for monitoring project implementation and for conducting research.

The last section not only helps support other units in carrying out self-monitoring and self-evaluation, but it also evaluates some specific projects. The organizational location of the MEU and its linkage with DAE are represented graphically in figure 12-1 [see also figures 8-1 and 8-2, chapter 8].

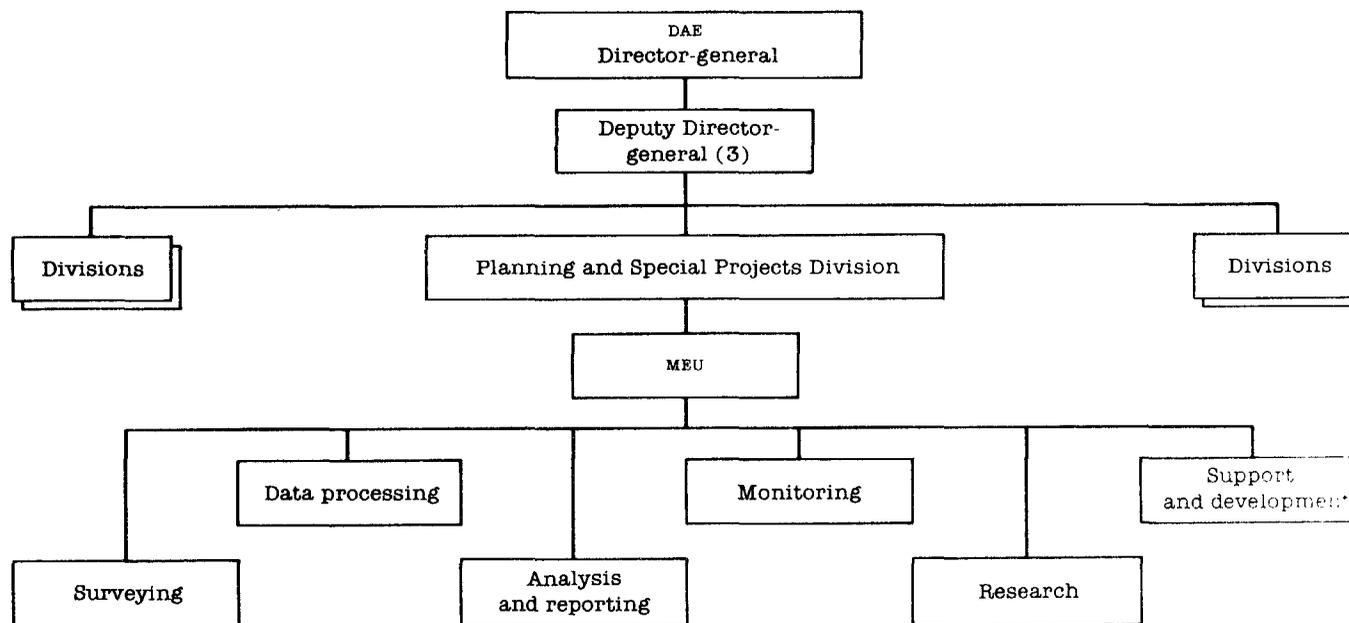
Table 12-3. Summary of Activities of the Monitoring and Evaluation Unit (MEU), DAE, 1977-81

Type of activity	No. of times in fiscal year				
	1977	1978	1979	1980	1981
Training, workshop, and seminar on project evaluation	1	1	3	2	1
Support and supervise other units in project evaluation	1	2	1	—	—
Evaluation of activities related to farmers' institutions	1	1	2	—	3
Evaluation of the national extension system	—	1	1	1	1
Evaluation of other specific projects	—	—	—	6	3
Monitoring survey	—	—	2	2	4
Case studies	—	—	2	1	1
Other	—	—	—	3	—

— Not applicable or not available.

Note: For more detailed information, see table 12-10.

Figure 12-1. Organization Chart of the Monitoring and Evaluation Unit (MEU) and Its Relations with Department of Agricultural Extension (DAE) Management, Thailand



Note: For organization charts of the Ministry of Agriculture and Cooperatives (MOAC) and of the DAE, see chapter 8 of this volume (figures 8-1 and 8-2).

Table 12-4. Staff Existing and Expected, MEU, DAE, 1977-81

Type of staff	1977		1978		1979		1980		1981	
	A	E	A	E	A	E	A	E	A	
Permanent										
B.S. or higher	1	12	4	20	4	27	4	27	5	
B.S. or higher (borrowed)	—	—	2	—	3	—	4	—	3	
Lower than B.S.	—	1	—	2	1	3	1	3	1	
Temporary										
B.S.	2	—	8	—	15	—	29	—	38	
Lower than B.S.	—	—	1	—	3	—	5	—	6	
Total	3	13	15	22	26	30	43	30	53	

— Not applicable or not available.

A Actual or existing number.

E Expected number of staff for Phase I only.

Note: Numbers exclude drivers and field enumerators.

Staffing of the MEU

Initial plans called for thirty permanent staff in the MEU by 1981. The current number of our actual staff is considerably below that expectation—there are only six permanent staff plus three borrowed from other parts of the Planning and Special Projects Division. We had to confront staffing difficulties and still carry out our monitoring and evaluation program, and therefore we partially compensated the lack of permanent staff by hiring some temporary staff. Fortunately, the budget for the MEU's activities was nonetheless allocated as requested. The distribution of our actual and expected permanent and temporary staff is shown in table 12-4; the length of temporary employment is given in table 12-5; and expenditures versus budget allocations per year are described in figure 12-2.

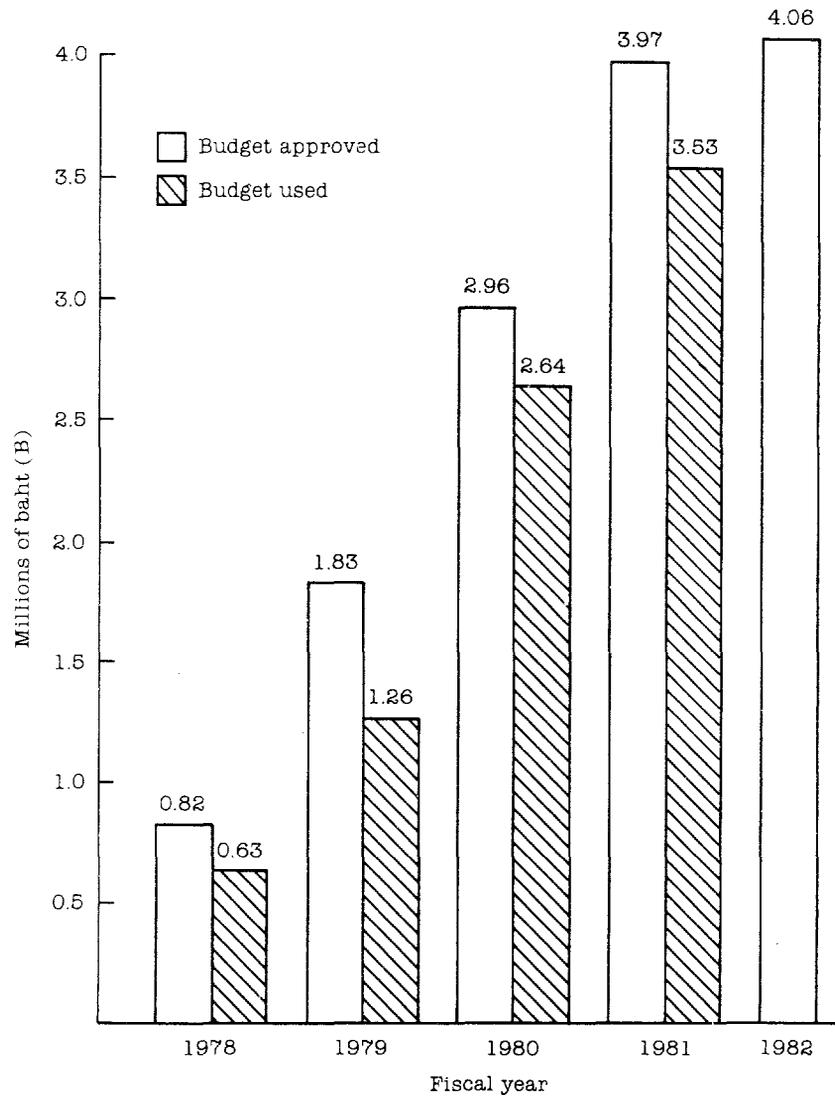
Relations with management

The MEU, as already mentioned, is under the Planning and Special Projects Division of DAE. The MEU is considered a management tool of DAE because it not only monitors implementation but also identifies problems, a function which can assist management in improving extension services. Contact between the MEU and DAE management, however,

Table 12-5. Months of Temporary Staff Employment in the MEU, DAE, 1976-81

No. of months	No. of staff	Percentage
Less than 4 months	36	33.3
4-6 months	25	23.8
7-9 months	17	16.2
10 months and over	28	26.7
Total	106	100.0

Figure 12-2. Amount of Budget Approved and Used, DAE, MEU, FY1978-81



Note: US\$1 = B23.

is maintained through the Planning and Special Projects Division. That is, reports from the MEU to the Director General's office, to the Deputy Director Generals, or to other DAE divisions must be channeled through the Planning and Special Projects Division (see figure 12-1).

Although the MEU may be asked to monitor any of DAE's projects, its main efforts are concentrated on NAEP. A few other DAE divisions and units—such as the NAEP Subdivision, the Office of Accelerated Loan Projects, and the Training Office—conduct certain monitoring activities according to the responsibilities they have been assigned. The NAEP Subdivision takes care of the reporting system, particularly for monitoring progress in NAEP implementation. The Office of Accelerated Loan Project, which was established to manage procurement and construction activities, reports to management on progress in that respect. The Training Office uses immediate evaluation or knowledge tests and conveys the results to management. The MEU, however, focuses its monitoring on the analysis of implementation in the field on a random basis.

THE MONITORING

The objectives, methodology, and reporting of monitoring activities, as well as the problems encountered, are the topics of this section.

Objectives and responsibilities of monitoring

The agreed objectives of the monitoring are to analyze allocation and utilization of major resources and to analyze project implementation and outputs compared with original plans. To accomplish the NAEP's monitoring objectives, several project components were selected for analysis: (1) allocation and utilization of personnel, facilities, budget; (2) effectiveness of demonstration or field day; (3) fortnightly training; (4) farm visit by extension agents; (5) supervision of district and provincial levels; (6) selection and utilization of contact farmers; and (7) administration and coordination. These issues were defined as priorities at the beginning of the design of the monitoring and evaluation system. In addition, other aspects may be assigned for monitoring to serve management's needs or may be proposed for study, by the MEU, to supplement the information presented to management.

Design and methodology

The MEU decided to adopt the model of the monitoring survey for gathering data on these various project components. Such surveys are to take place in approximately three rounds a year. In general, they are to focus on four main aspects of extension services: (1) the fortnightly training, (2) the visit of the extension agent, (3) the response of the contact farmers, and (4) the supervision of the field agents. Our monitoring survey includes details of the scheduling, the activity performed during the visit, the number of farmers who received recommendations, and the farmers' attitudes toward the visiting.

Several sources of information are required for each category. For monitoring the quality of the visit, the sources of information are district extension officers, field extension agents, contact farmers, and other farmers. The technique of the survey includes observation, questionnaires, and personal interviews. Some variation in information needed, sources of information, and sampling technique was necessary because of the different groups of the project provinces. Using several sources of information, and especially collecting data from farmers, increased the cost of the survey but minimized the

Table 12-6. Example of Monitoring Survey Design

Main issue	Major information needed	Source of information	Instrument and technique
Fortnightly training	<ol style="list-style-type: none"> 1. Planning of appropriate technology transfer 2. Effectiveness of problem solving 3. Benefits got 4. Attitude toward the training 	<ol style="list-style-type: none"> 1. Provincial Subject Matter Specialists (SMSs) 2. District Extension Officers 3. Field Extension Agents 4. Contact and other farmers 	<ol style="list-style-type: none"> 1. Observation during the training 2. Distributed questionnaire 3. Personal interview
The visit	<ol style="list-style-type: none"> 1. Visit as scheduled 2. Activity performed during the visit 3. Number of farmers receiving and following the recommendations 4. Relation between the fortnightly training and the visit 5. Attitude toward the visiting 	<ol style="list-style-type: none"> 1. District Extension Officers 2. Field Extension Agents 3. Contact and other farmers 	<ol style="list-style-type: none"> 1. Distributed questionnaire 2. Personal interview
Contact farmers	<ol style="list-style-type: none"> 1. Selection technique 2. Utilization as key communicator 3. Benefits got 4. Attitude toward the contact-farmer concept 	<ol style="list-style-type: none"> 1. District Extension Officers 2. Field Extension Agents 3. Contact and other farmers 	<ol style="list-style-type: none"> 1. Distributed questionnaire 2. Personal interview
Supervision	<ol style="list-style-type: none"> 1. Amount of supervision 2. Technique of supervision 3. Benefits got 4. Attitude toward supervision 	<ol style="list-style-type: none"> 1. Provincial Extension Officers 2. Provincial SMSs 	<ol style="list-style-type: none"> 1. Distributed questionnaire 2. Personal interview

bias inherent in gathering data from official sources alone. Table 12-6 provides a summary design of the monitoring survey in a tabular format containing the list of information indicators pursued, the sources of information for each group of indicators, and the monitoring instruments and data collection techniques used by the MEU.

Planning and processing the surveys

Because of the complexity of the monitoring system, the various phases have to be articulated into a smoothly flowing procedure of data collection and analysis that is tailored to the agricultural seasons and designed so as to make best use of manpower resources in the MEU. Planning is therefore highly important.

Most of the MEU's efforts during its first year of operation in 1978 were devoted to system design and to conducting the first benchmark survey (within fifteen provinces) as a baseline for impact evaluation. Monitoring activities were then begun in 1979.

Data from this benchmark survey were processed at headquarters, with only little use of data-processing machines. The validity and the consistency of answers were checked carefully, and simple statistical analyses (percentile, average) were applied. The data were presented mainly in tabular form (rather than in graphs or charts) according to regions or groups of provinces and project year.

Findings and feedback to management

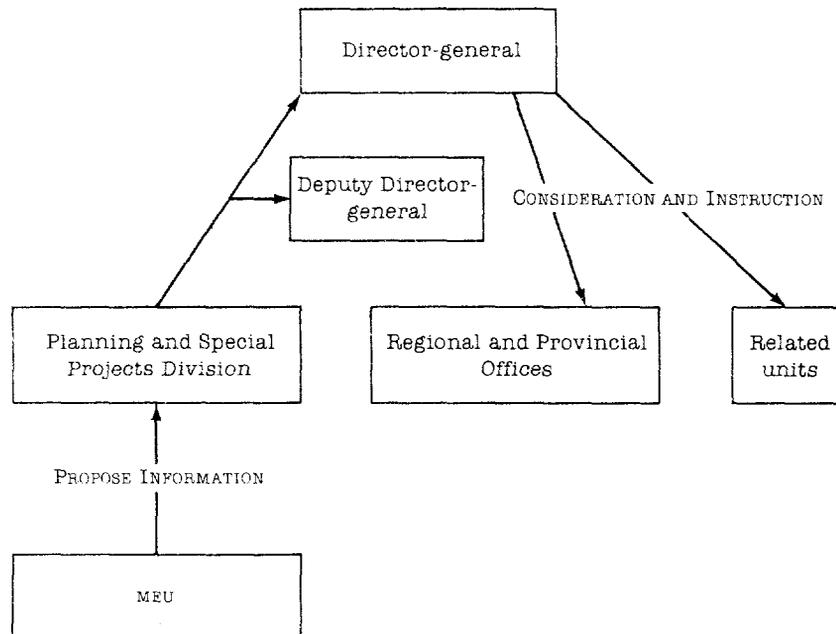
The monitoring efforts resulted in a number of significant findings. Such findings were area specific and were substantiated by empirical data from the provinces and villages covered by the surveys, but nevertheless they provided cues to management about possible similar situations in other areas. Such findings referred to shortcomings in manpower management within the T & V project; to weaknesses in the organization of the fortnightly training; to the performance of field visits; and to improper application of instruction for selecting contact and other farmers. (A sample of such findings is given in table 12-9 and includes the summary recommendations made to management by the MEU based on each finding.)

The reports of the MEU are submitted to management through the Planning and Special Projects Division. Every report has to reach the Director General and the Deputy Director General for consideration. The monitoring findings have been actively taken into account most of the time, particularly in the first two years of the project. Meetings of division directors and directors of regional offices within DAE have been held to discuss the results of the monitoring surveys. Subsequent to these meetings, instructions may be given to provincial offices and other units concerned for corrective actions. The feedback system of monitoring results is represented in a flow chart in figure 12-3.

Problems in monitoring

A few problems became evident as the monitoring activities unfolded. For one, the MEU is not the only one to conduct monitoring for NAEP. To complicate matters further, the MEU is also responsible for monitoring projects other than NAEP, if required. Hence, the scope of the work compared with the number of staff is unrealistic. Although the total number of staff may reach fifty, most of these people are temporary and lack adequate experience in monitoring activities. The bulk of the workload in designing, training, data collection, data processing, interpretation, and reporting falls on the few who are permanent staff. As a result, the completion of many reports tends to be delayed, and this reduces the operational effectiveness of the reports.

Figure 12-3. Feedback System of Monitoring Results, MEU, DAE



Another serious problem is that a number of extension officers working in the field are still not well informed of, or even convinced about, the benefits of monitoring and evaluation. Many of them view monitoring and evaluation activities with skepticism and hesitate to give unbiased information. This reaction can seriously hamper the performance and utilization of monitoring.

IMPACT EVALUATION

The topics and organization of this section are similar to those for monitoring.

Objectives of evaluation

The main aim of the MEU's impact evaluation activities is to analyze the NAEP's effectiveness. More specifically, the objectives were to assess: (1) changes in the communication or information flow system, (2) adoption rates of recommended practices, (3) utilization of farm inputs, (4) yields of major crops, (5) level and distribution of income, and (6) standard of living.

Planning, methodology, and findings

The evaluation survey was adopted as one of the means for assessing these changes. A benchmark survey of farmers was conducted before project implementation. After three years, a repeat survey was to be conducted within the same sample villages to compare changes in these two sets of data. During a three-year period, 10 percent of the total villages sampled were to be surveyed again to estimate trends. Later, however, this last survey had to be abandoned because it was thought to have too limited a sample base for a valid interpretation. Thus, the MEU designed a time frame and a space frame to schedule these surveys in successive years, with repeated surveys of same areas at certain intervals. This schedule is presented in table 12-7. The structured interview for the survey took place during April and May each year. Data were processed mainly in the headquarters offices, with the assistance of the National Statistical Office (NSO). Baseline data

Table 12-7. Framework of Farmers' Survey for Impact Evaluation of National Agricultural Extension Project (NAEP)

Project year	No. of provinces	No. of villages sampled	Farmers' survey in year								
			1977	1978	1979	1980	1981	1982	1983	1984	1985
1977	4	105	^a	T ₀	(10%)	(10%)	T ₁				T ₂
1978	11	164		T ₀	(10%)	(10%)	T ₁				T ₂
1979	10	167			T ₀	(10%)		T ₁			
1980 ^b	15	376				T ₀			T ₁		
1981	16	242					T ₀			T ₁	
1982	16	204						T ₀			T ₁
Total	72	1,258		269	194	420	511	371	376	511	204

T₀ Benchmark survey; T₁ first repeated survey; T₂ second repeated survey; (10%) survey of 10 percent of total number of villages sampled.

a. No survey because the MEU was established a year after NAEP was launched.

b. Last year of NAEP I and first year of NAEP II.

and data expressing changes were to be reported to the management, the World Bank, and others involved.

The next question was how to organize and schedule the evaluation survey. It was proposed that preparation and implementation of the farmer survey be divided into five steps: (1) design of information needed and questionnaires, (2) design of sample and sampling technique, (3) field operations for data gathering, (4) data processing, and (5) interpretation and reporting.

The type of information required was determined on the basis of the evaluation objectives mentioned earlier. Two main categories of information were identified: first, general information on communication, utilization of farm inputs (quantity and types), yield of major crops, level and distribution of income (sources), and standard of living; second, information on crop technology. The type of major crops indicated by DAE and the crop modules (crop technologies to be transferred to farmers) were the main guidelines for the construction of the evaluation questionnaires. The questions focused mainly on the farming practices of farmers and on their knowledge and attitude toward those technologies.

NSO recommended multistage sampling for the MEU. Villages to be sampled were selected by using the "probability proportion to size" of farm households, which was done by NSO. Systematic random sampling was applied to select sample farmers (fifteen household heads per village sampled). The number of villages sampled was approximately 2.5 percent of the total number of villages, and the number of farm households sampled was about 0.5 percent of the total.

University students were the field enumerators. Four universities located in four regions were asked to recruit students having certain qualifications. We deemed it necessary to provide good pretraining to enumerators. These students received intensive training for about eight days on what and how to interview and record. Then we grouped them into survey teams. Each team consisted of one team leader, one editor, five enumerators, and one driver. A field supervisor was responsible for two to three survey teams. Each survey team was to interview a certain number of farmers per village, or fifteen sample farmers per day. The number of survey teams would depend on the number of samples to be interviewed. At any rate, each survey team was to collect data for no longer than sixty days.

A preliminary effort was made to compile lists of farmers to establish a sampling frame. Appointments with farmers randomly selected in the sample were made two to three days ahead of the interview. Field editing, both by enumerators and by survey team leaders, was required. Every survey team was to hold a meeting at least once every fortnight, or whenever necessary, to review both technical and administrative responsibilities. A special coordinating committee was formed at headquarters to assist and coordinate the efforts of the survey teams. Consistency of information collection procedures among survey teams was stressed.

Data processing began during the survey. As already noted, field enumerators and team leaders were required to carry out field editing and to check answers during the interview. Answers were then transformed into a numeric coding system that was verified by the editor of each survey team. Coding was transcribed onto code forms, verified again, and submitted to headquarters for punching. Codes and consistency of each item were checked and updated.

Interpretation of both baseline data and comparative data was to be carried out. Unfortunately, reports on baseline data and the comparative study had to be delayed because of the lack of qualified staff. (It is assumed that we will soon be in a position to present some example of the findings.)

Problems in evaluation

It is instructive to note some of the difficulties that arose during the evaluation survey. Most of them can be traced to the lack of qualified staff. First, we experienced difficulty designing the questionnaires and related documents. Only a limited amount of time was devoted to preparing and training the survey staff, team leaders, editors, field enumerators, and others. Furthermore, the team leader and editor had to be trained every time a survey began because of the constant turnover of temporary staff.

The absence of sample farmers became another hindrance, even though appointments had been made two to three days in advance. Farmers could not see the importance of the survey, and some of them cooperated very little. Transport to sample villages during the rainy season and the security of the survey team in some districts became other obstacles and made the survey less effective. Most Thai farmers are not used to keeping their own records, especially production records, and this factor caused many errors in the responses. Communication barriers—especially in some of the southern provinces, where farmers speak Yawi—added to the limitations of the interviews, although in some cases interpreters could be used or student enumerators who were able to speak Yawi could provide assistance. The period of the survey—about sixty days—was also found to be too long for an effective survey.

Last, problems in processing data were a major concern throughout the first year of the activities. Like the other problems, these were the result of lack of experience with this type of work. Hence, every step of the processing took place under the guidance and assistance of NSO, which itself was overworked. Finally, our capability in analysis and interpretation was very limited, once again because our permanent staff was too small.

CASE STUDIES

Case studies complement the MEU's monitoring and evaluation surveys. This section describes the sociological analyses undertaken.

Objectives of sociological analysis

The sociological aspects of extension services are an important aspect of any project and of project monitoring and evaluation, for various reasons. Extension deals with farmer behavior, attitudes, and beliefs; the success of extension depends largely on good social communication patterns and on the cultural network in villages. Such processes cannot be captured and understood well only through large-scale sample surveys because the samples consist of scattered individuals who in real life do not function as a social group or network. Therefore, it is extremely useful to complement the surveys with sociological case studies that explore some villages or social groups in their entirety, for a deeper insight into the reactions to extension of the cultural or political system of the village. The case study also helps the causal analysis of some of the problems signaled by surveys and thus aids in the development of more appropriate extension strategy.

Planning, methodology, and findings

Sociological case studies can be carried out more quickly than large-scale sample surveys, with less resources and with speedier results for management. We have also the advantage of choosing topics to be studied to meet the immediate needs of management.

The MEU identified a set of such topics for in-depth but quick studies of our T & V project and proposed them for approval to the management. The following are some case studies which we have conducted since 1979.

On the role of extension agents. The first sociological study was a comparative analysis of assigned and actual roles performed by tambon agricultural extension agents in northeastern Thailand. The objectives of the study were to compare these two sets of roles and to find whether there is an association between the congruity of assigned and actual roles, on the one hand, and the adoption rate of recommended practices for rice cultivation, on the other. The population for this study were 116 contact farmers selected from four provinces in the Northeast, which had entered the NAEP in the first year of its operation. Twenty-one subdistricts were selected systematically from a total of 508. One sample village per subdistrict was randomly selected. Every contact farmer from each sample village was our respondent. Data were collected through in-depth interviews. The results showed that extension agents did not yet fully perform their assigned roles. But the trend indicated that extension agents who performed more assigned roles were better sources of agricultural information and would more efficiently induce the contact farmers to adopt the new techniques.

The second special study was a joint study with the Southern Regional Agricultural Office in 1980 and was entitled "Job Performance of Tambon Agents in the NAEP in Songkla Province, Thailand." The principal objectives of the study were to determine job performance of extension agents as perceived by contact farmers and the factors related to that job performance. Twenty-two sample subdistricts were selected systematically from a total of 114 in the province. One sample village was selected from each sample subdistrict. Extension agents in each subdistrict sample and contact farmers in each sample village were the respondents (22 agents and 178 contact farmers). Data were collected from extension agents and contact farmers by means of personal interview. Percentile, mean, range, standard deviation, and the Fisher test were the statistical tools for analysis. The results showed that fourteen of the twenty-two extension agents had high job performance. However, there was no relation evident between job performance and the agents' demographic profile, problems encountered, and motivation to work.

On contact farmers. We decided to carry out another in-depth sociological case study to assess the reality of what is a basic assumption in the T & V system: the contact farmer serves as a redistributor of technological information received from the extension agent. The management of the T & V projects can seldom know accurately whether the contact farmers perform this role properly or continuously. This case study was conducted in 1981 in Maha Sarakham Province. The study aimed to observe influences on contact farmers in transferring agricultural technology—for mushroom and sesame cultivation—to other farmers in the villages and to study the patterns of transferral. Six small villages in Borabue District were selected for the study. Sociometric technique was applied to select one contact farmer per village during the benchmark survey. Two hundred and forty-seven farmers, or 75.5 percent, were interviewed. Six contact farmers were trained and encouraged to adopt the techniques and were asked to transfer what they had adopted to other farmers. The post-tests were implemented from the same farmers, but only 200 farmers were reinterviewed. Percentile, chi-square test, and t-test were statistical tools for the analysis. The results showed that most contact farmers do play their roles as disseminators of information. The pattern by which farmers obtained information from contact farmers was a combination of several methods, demonstration being the pre-dominant one.

Two other sociological short-term studies were being conducted in 1982. One explores the factors affecting the rate of adoption of innovations recommended by the extension service. The other attempts to identify training needs of extension agents in the central region of Thailand.

In the Thai system, every case study is reported to management. Instruction and summary reports are also sent to provincial offices and other units involved. These studies are particularly useful in reconfirming the effectiveness of former extension strategies among farmers.

Altogether, the MEU has carried out a large number of surveys and special studies over the past five years. (A detailed list of these studies and various activities is included in table 12-10.)

COST OF THE MONITORING AND EVALUATION EFFORT

The annual budget approved and used for the monitoring and evaluation activities from 1978 to 1982 was illustrated in figure 12-2. The breakdown of the MEU budget, by categories of expenditure, is shown in table 12-8.

From the table it is visible which monitoring and evaluation activities cost more and which cost less. For the future, to minimize the overall costs of impact evaluation

Table 12-8. Cost of Monitoring and Evaluation Effort, 1978-81

Activity/Item	1978	1979	1980	1981	Total
NAEP impact evaluation					
Survey					
No. of survey	1	1	1	1	4
Enumerators cost	120.5	119.9	152.1	200.0	592.5
Operating cost (data collection)	423.3	411.9	861.4	1,654.6	3,351.2
Processing					
Enumerators cost	86.4	25.9	73.0	28.2	213.5
Operating cost	—	13.4	52.9	14.4	80.7
Temporary staff	—	189.6	278.4	502.6	970.6
Subtotal	630.2	760.7	1,417.8	2,399.8	5,208.5
Monitoring					
No. of monitoring survey	—	2	2	4	8
Operating cost	—	193.4	226.2	182.9	602.5
Temporary staff	—	189.6	278.4	502.6	970.6
Subtotal	—	383.0	504.6	685.5	1,573.1
Case studies					
No. of sociological case studies	—	2	1	1	4
Operating cost	—	24.8	24.4	36.8	86.0
Temporary staff	—	47.4	69.6	125.6	242.6
Other					
Subtotal	—	47.4	629.6	292.3	969.3
Total	630.2	1,263.3	2,846.0	3,540.0	8,079.5

Note: The total costs of employing temporary staff were divided between the different types of studies on an estimated basis.

activities (which are the most expensive both in staff time and operating costs), the MEU is currently preparing some proposals for simplifying the information requirements of the survey.

EFFECTIVENESS AND CONCLUSIONS

Although the effectiveness of the monitoring and evaluation efforts was not systematically measured, two major patterns are evident: direct and indirect impact. Direct impact is taken to mean that management has adopted the results of the monitoring and evaluation and has given instructions to the units concerned to review and improve their implementation. Indirect impact is taken to mean that the people involved have been made aware of problems and that they are being encouraged to find corrective measures. This effort can take place in training sessions, meetings, seminars, and so on.

To do monitoring and evaluation in any project, one should know and understand the project itself and the research methodology. In other words, monitoring and evaluation activities require experienced personnel. For the MEU of DAE, however, there are three problems which have hampered the unit's activities. First, the overall staff is inexperienced. Most are recent graduates on temporary assignment with the unit. Thus, it is difficult not only to train people for monitoring and evaluation activities, but also to provide continuity in the visitation. Hence, revision of monitoring and evaluation staffing is suggested.

Second, the nature of monitoring and evaluation operations in the DAE has led to considerable duplication of work. Self-monitoring and self-evaluation should certainly be encouraged, but, when units do undertake monitoring activities simultaneously, there should be some coordination of the work being done so as to strengthen the overall monitoring and evaluation activity.

Third, many people still have little understanding of monitoring and evaluation. Some view it as a type of policing, and this attitude has made it particularly difficult for the MEU to gather data. More efforts should therefore be made to convince farmers and others that monitoring and evaluation activities can produce economic benefits.

Despite the difficulties mentioned, the efforts of the MEU have produced significant findings and recommendations to DAE management (see table 12-9), and its many activities and studies (see table 12-10) have proceeded with regularity. Nevertheless, continuing work to improve monitoring and evaluation is needed.

Thailand's experience to date indicates that future plans for monitoring and evaluation of extension work in this country should include consideration of the following recommendations.

- Feedback on implementation should be increased and concentrated through the reporting system.
- Reliable sample surveys should still be conducted to ensure that information is sound.
- Every division, regional office, and provincial extension office should be encouraged to carry out self-monitoring and self-evaluation and should be provided the support necessary to do so.
- Utilization of the monitoring and evaluation results by management should be more concentrated.

Table 12-9. Main Findings of Monitoring Effort, MEU, DAE

Finding	Recommendation/Solution
<u>Manpower management</u>	
<ol style="list-style-type: none"> 1. Number of Subject Matter Specialist (SMSs) and extension agent (EAs) appointed are less than expected. Delay of recruitment and appointment of ten occurred. 2. Number of SMSs were assigned equally either in the large or small provinces. 3. The ratios of EAs to farm families are different in many locations. 	<ol style="list-style-type: none"> 1. DAE has several times negotiated with the Civil Service Commission and the Budget Bureau to eliminate the problems. 2. Flat rate of SMSs per province should be reviewed. Number of major crops, districts, farm families, and other factors should be taken into consideration in deciding number of SMSs per province. 3. Readjustment of number of EAs in several locations should be made to equalize workload of EAs.
<u>Equipment and other facilities</u>	
<ol style="list-style-type: none"> 1. Procurement and allocation of equipment and other facilities, especially motorcycles for EAs, were delayed. 	<ol style="list-style-type: none"> 1. Rules and regulations on procurement have been reviewed to minimize the problem.
<u>Training courses</u>	
<ol style="list-style-type: none"> 1. The recruitment of senior SMSs to be trained and assigned as "the Trainer" was not well planned. Many of them are junior staff and then were transferred to other positions when they did not meet the qualifications. 2. New recruit SMSs were trained only in extension methodology. Complaints of efficiency of new SMSs always occurred. 3. Inadequate training in administration, especially for District Extension Officers. 4. Assistants of Provincial Extension Officers and the Assistants of District Extension Officers were initially left out of the training plan, although they have to be involved in the project implementation. 5. The refresher courses for SMSs and District Extension Officers in extension methodology and the working system were insufficient. 	<ol style="list-style-type: none"> 1. The situation had been reviewed and finalized so that those who will act as "the Trainer" must be trained from the pre-service course in extension methodology. 2. Refresher course on crop methodology, a monthly workshop for Provincial SMSs, is held by Regional Offices. 3. It was recommended to give them training in administration. 4. The situation has been solved, especially for the Assistant of District Extension Officers. 5. It was recommended to review the importance of the refresher course.
<u>Fortnightly training (FT)</u>	
<ol style="list-style-type: none"> 1. Technology transfer in the FT <ol style="list-style-type: none"> 1.1. Subject to be taught in the FT has been planned ahead at the beginning of the fiscal year, and most of the provinces can follow the plan. 1.2. At any rate, the subject taught in the FT in many provinces has been analyzed, if not related to, the timing and location (environment) of EAs. Subjects taught in the FT are mainly on crop technology, and very few on extension strategies. This has been found even in the provinces participating in the project for 3-5 years. 1.3. District extension officers were found less active as trainers in the FT. 2. Problem solving in the FT <ol style="list-style-type: none"> 2.1. Most of the problems raised in the FT are technical. At any rate, problems raised in each FT are not related to the subject taught in the FT before. 	<ol style="list-style-type: none"> 1. To make EAs receive more relevant technology: <ol style="list-style-type: none"> 1.1. Every province should review its FT Plan once every month at the monthly meeting of all District Extension Officers. 1.2. Subject on extension methodology and other social subjects related to the work of EAs should be given in the FT. 1.3. Care in the selection of trainer in the FT; District Extension Officer's role as trainer should be more concentrated. 2. To make EAs benefit more from problem solving: <ol style="list-style-type: none"> 2.1. EAs should be trained in techniques of identifying problems and should be encouraged to bring out problems EAs cannot solve themselves.

(Table continues on following page.)

Table 12-9 (continued)

Finding	Recommendation/Solution
<p>2.2. EAs were divided in small discussion groups, and problems raised were finalized in the plenary. SMSs are major resource persons in problem solving.</p> <p>3. Attitude of District Extension Officers and EAs toward the FT</p> <p>3.1. Many of them still express some benefits from the FT. Many of them felt tired in participating in the FT and asked that the training be extended to once every two fortnights.</p>	<p>2.2. Every one in the FT, especially EAs and District Extension Officers, should be influenced to participate more in finding solutions.</p> <p>3. To make EAs benefit from the FT</p> <p>3.1. Frequency of the training should be reconsidered, especially in the provinces which have adopted the system for more than 3 years. At any rate, before extending the timing of training in any provinces, test the work performance of EAs.</p>
<p><u>The visit (farm visit by EA)</u></p>	
<p>1. Many EAs do not visit every village for which they are responsible on the fixed schedule basis of once every fortnight due to many factors—for instance, willingness of EA, morale support from superior, lack of supervision, emergency works, and others.</p> <p>2. Most EAs submit their implementation plan, some every fortnight and the rest every two fortnights.</p> <p>3. Individual approach in farmer's house and/or field is mostly utilized. Demonstration plots, group discussions, etc. are also used. Contact farmers are concentrated in the visit.</p> <p>4. The majority of farmers who know the EA reply that they adopt the recommendation, at least once, and appreciate performance of the EA.</p>	<p>1. The visit system should be reconsidered in some locations. But once it is finalized and instructed, support in many ways should be present to maintain those who adopt and follow the instruction.</p> <p>2. The way of doing the implementation plan should be more concentrated, and the superior should also check the appropriateness of the plan.</p> <p>3. The utilization of mass media, especially printed and radio programs, should be more concentrated.</p> <p>4. EAs should be influenced to give service to all farmers.</p>
<p><u>Contact farmers (COF)</u></p>	
<p>1. Most EAs finish the selection of COFs, but many of them did not strictly follow the instruction.</p> <p>2. The utilization of COFs is not well done in many locations. Many farmers are still not aware of the selection and names of COFs in their villages. Most EAs make use of COFs by requesting COFs to participate in demonstration plots.</p>	<p>1. Instruction for the selection should be given in those locations starting the selection so that the principles and guidelines will be followed.</p> <p>2. Technique of utilization of COFs should be reinstructed.</p>
<p><u>Supervision</u></p>	
<p>1. The amount of supervision at the field level has increased since 1981. Anyhow, very few supervision activities have taken place at some levels (for example, from headquarters, from some regional and provincial levels).</p> <p>2. Although there were signs of favorable attitude in EAs and District Extension Officers, the implementation of supervision is questionable in its strategy.</p>	<p>1. Supervision should be implemented at all levels. Scope and level of supervision should be taken into consideration.</p> <p>2. Technique and strategies in implementing supervision should be reviewed and instructed.</p>
<p><u>Coordination</u></p>	
<p>1. Most of the coordinating committees (for example, the Provincial Coordinating Committee, the Technical Advisory Panel) are inactive.</p>	<p>1. Coordination line should be reviewed.</p>

Table 12-10. Studies and Activities Performed by the MEU, DAE, 1977-81

Year	Description
1977	<ol style="list-style-type: none"> 1. Training for Regional and Provincial Subject Matter Specialists on Project Evaluation I. 2. Supervise Provincial Subject Matter Specialists on their Evaluation of Demonstration Plots, First Year. 3. Evaluation of the National 4-H Congress XVIII.
1978	<ol style="list-style-type: none"> 1. Training for Regional and Provincial Subject Matter Specialists on Project Evaluation II. 2. Supervise Provincial Subject Matter Specialists on their Evaluation of Demonstration Plots, Second Year. 3. Support and Supervise Six Regional Offices on Training of District Extension Officers on Project Evaluation I. 4. Study on Attitude of Home Economic Agents toward Home Economic Activities. 5. First Benchmark Survey from Farmers for Impact Evaluation of the National Extension System (in 15 provinces).
1979	<ol style="list-style-type: none"> 1. Second Benchmark Survey from Farmers for Impact Evaluation of the National Extension System (in 10 provinces). 2. First Monitoring Survey on the National Extension System. 3. Second Monitoring Survey on the National Extension System. 4. A Comparative Study on Assigned and Actual Roles of Tambon (Subdistrict) Extension Agents in Northeast. 5. Adoption of Agricultural Innovations: An Analysis of Farmers' Socio-Economic Characteristics, Personality Variables, and Communication Behavior in the Northeast. 6. Evaluation of the National 4-H Congress XIX. 7. Evaluation of the Sixth Conference of Representatives of Farmers' Associations. 8. Train-the-Trainer Course on Project Evaluation. 9. Support and Supervise Six Regional Offices on Training of District Extension Officers on Project Evaluation II. 10. Seminar on Evaluation Policy.
1980	<ol style="list-style-type: none"> 1. Third Benchmark Survey from Farmers for Impact Evaluation of the National Extension System (in 15 provinces). 2. Third Monitoring Survey on the National Extension System. 3. Fourth Monitoring Survey on the National Extension System. 4. Job Performance of the Tambon (Subdistrict) Agents in the National Agricultural Extension Project in Songkla Province. 5. Evaluation of Provincial Officers' Seminar. 6. Evaluation of Seed Multiplication Seminar. 7. Evaluation of Exhibition of Farmers Housewife Association's Products. 8. Evaluation of Tambon Agents' Pre-service Training. 9. Evaluation of Large-Scale High-Yielding Rice Variety Demonstration Plots. 10. Evaluation Workshop of Regional and Provincial Subject Matter Specialists. 11. Evaluation Workshop of Subdivision Chiefs. 12. Benchmark Survey from Farmers of the Nam Pong Irrigation Project Phase II. 13. Revision of the Reporting System of the Department of Agricultural Extension. 14. Planning and Administering the Selection of Village Agricultural Volunteers (Farmers) on Rice Price-Supporting Scheme Project. 15. Planning and Administering the Selection of Contact Farmers (in 40 provinces).
1981	<ol style="list-style-type: none"> 1. Fourth Benchmark Survey from Farmers for Impact Evaluation of the National Extension System (in 16 provinces). 2. First Repeated Survey from Farmers for Impact Evaluation of the National Extension System (in 15 provinces). 3. Fifth Monitoring Survey on the National Extension System. 4. Sixth Monitoring Survey on the Training of Village Agricultural Volunteers. 5. Seventh Monitoring Survey on the Administration of Extension Project. 6. Eighth Monitoring Survey on the National Extension System. 7. A Study on Agricultural Technology Transfer by Contact Farmers in Maha Sarakham Province. 8. Evaluation of the National 4-H Congress XX. 9. Evaluation of the 4-H Camping Activity. 10. Evaluation of the National Conference of the Chairmen of Farmers' Associations. 11. Evaluation of the Exhibition of Appropriate Technology for Farmers. 12. Evaluation of Tambon Agents' Pre-service Training. 13. Evaluation of the Agricultural Radio Program. 14. Evaluation Workshop of Regional and Provincial Subject Matter Specialists.

*Evaluation of Farmers' Reactions
to Extension Advice:
A Comment*

Michael M. Cernea

Monitoring performance and evaluating impact are essential to managing an agricultural extension service and to incessantly readapting the service to the needs of its clients—the farmers. Therefore, the Training and Visit (T & V) organizational methodology needs to define clearly its position relative to monitoring and evaluation techniques and to incorporate the lessons learned from these activities. This process of definition and reassessment will help to develop, to fine tune, and thereby to strengthen further the T & V methodology.

It is toward such clarification and refinement that I direct the following comments. First, one must ascertain:

- What is the present state of monitoring and evaluation activities within the T & V extension services?
- How conducive to knowledge and action are the monitoring and evaluation techniques and strategies currently applied?

A structural feature of the T & V organizational design is its built-in self-monitoring capability. Indeed, the managerial elegance and simplicity of the T & V design consists, among other things, in the following three characteristics:

- Having every level of the organization monitor the operation of the level immediately below it through its own regular activities
- Defining sharply each staff member's task or role in the system to permit easy performance measurement
- Last but not least, inviting and structuring extension users into the mechanism of monitoring the performance of extension agents.

Because such a monitoring mechanism is built in, one can legitimately ask whether a T & V extension service still needs a formal, distinct, and independent monitoring and evaluation subsystem.

My answer is yes. The main reason, in my view, lies in the need to distinguish between T & V as an organizational model and the realities of using the T & V extension approach in specific contexts, projects, or extension agencies. The model and the reality are often not identical. Thus, confusion is created when the justified and necessary criticism of the specific weaknesses or inconsistencies in implementing the model is mixed with speculative questioning of the organizational model as such. Even some recent academic analyses of extension have failed to take account of this distinction. There are unavoidable

(sometimes unintended, other times desirable) departures and deviations from the model one plans to implement, and these should be scrutinized. The model as such, as well as its implementation, can be subjected to improvement. Monitoring and ongoing evaluation activities are necessary to identify such departures and to trigger adequate action. This can help managers to increase the effectiveness of extension agencies and to strengthen the consistency between everyday practice and the overall intended policy.

Such differences from the designed model are not surprising. In many countries, instituting a T & V system "may be nothing short of revolutionary, involving changes in the philosophies, organization, and operations of the central government and its agencies" (see chapter 1). The monitoring and evaluation of these changes, of their pace, and of course of the reaction of farmers to extension advice is a tool without which this organizational transformation could not effectively proceed.

THE PRESENT STATE OF MONITORING AND EVALUATION

Five and a half years ago, at the first international workshop on the T & V system (held in the Philippines in March 1977), there was not a single paper presented on monitoring and evaluation. In 1982 at Chiang Mai, a full day was devoted to this topic. This fact is significant in several ways.

Toward the end of 1977, the World Bank issued a paper recommending a system for the monitoring and evaluation of agricultural extension projects (Cernea and Tepping 1977). At the same time, several agricultural extension projects were appraised that incorporated specific provisions and funds for monitoring and evaluation. Unfortunately, only one or two of these projects did start, in 1978 or 1979, actually to build up their monitoring and evaluation capability as planned. Most projects did not: they gave priority to building up the regular staff of the reformed extension organization and to setting this organization in motion along new patterns, without worrying too much about a monitoring and evaluation unit. Nor did the Bank, through the technical assistance it offered in those years, emphasize the build-up of monitoring capability, accepting instead to leave these activities for later years despite having issued guidelines for immediate monitoring and evaluation. The consequences were predictable: although there was some progress here and there, monitoring and ongoing evaluation were badly neglected.

Admittedly, only in the last two to three years have many national extension projects, ministries of agriculture, and the World Bank decisively pursued the establishment of monitoring and evaluation units. Recently a more limited "manual of instruction" for monitoring T & V extension in India has been prepared (Slade and Feder 1981), and the Bank has made a deliberate decision to allocate more manpower resources to technical assistance for evaluation work. Today, there are a number of project monitoring and evaluation units operating more or less in full swing (the unit in Thailand discussed by Adisak Sreensunpagit in chapter 12; a few units in India, particularly those in Gujarat, Kerala, and Madhya Pradesh; and units in some other projects).

While I recognize this considerable development, it is my opinion that monitoring and evaluation are still lagging far behind the general progress in organizing the T & V extension services.

The magnitude of the overall technical assistance efforts and financial investments made in the past six to eight years by various national governments and by the World Bank in the T & V extension system is indeed impressive. There are already about sixty Bank-

assisted projects in operation that claim to be applying fully, or to be influenced significantly by, the T & V approach; some thirty other projects taking the same organizational approach to extension are now in the appraisal or preparation stages (Israel 1982). This should be contrasted with the modest proportions of monitoring and evaluation efforts and results.

There is little aggregate information generated through empirical evaluation about various agronomic, social, or economic processes triggered by T & V extension or about the reactions of farmers to extension advice. There is little in-depth knowledge about the further dissemination (or hoarding) of extension messages by contact farmers. The hard data available on adoption rates, on changes in cropping patterns, or on yield increases are scattered and insufficient. In short, the T & V phenomenon is understudied; this refers to both its technical requirements and its sociological-cultural impact on farmers' behavior.

The causes of this scarcity of information can be traced, in my view, to four main factors:

- Delayed recognition of (or lip service to) the importance of monitoring and evaluation in general
- Weak (or nonexistent) institutionalization of monitoring and evaluation within many T & V extension projects (I have in mind both the inadequate organization of some of the evaluation units and their—sometimes—improper location within the administrative structure)
- Staffing difficulties (in particular, insufficient specialists in behavioral disciplines and in statistics have been recruited for monitoring and evaluation)
- Excessive (often exclusive) reliance on the extensive sample survey approach and neglect of simpler, speedier, more in-depth and manageable studies.

There are at least two distinct kinds of problems encountered in the exclusive sample survey approach: the methodological complexity of surveys and the large size of most surveys, which entails logistical requirements and difficulties that often are not solved correctly.

The experience of the T & V extension project in Thailand conclusively illustrates some of these difficulties. The evaluation unit in this project has been more active than many similar units in other projects and has carried out a vast array of activities. Yet it is far from achieving its original objectives, and the causes can be traced to the factors mentioned above. The case study on this unit in this volume (see chapter 12) as well as other evaluations of extension work in Thailand¹ inform us of a late start, great staffing constraints, and lack of results from complex large-scale surveys. Instead of the twenty-seven permanent staff budgeted for this unit, only five with adequate training could be assembled. The unit has been further constrained by having to rely on temporary staff—no less than forty-four in 1981. About 33 percent of these temporaries stayed for less than a month. This high turnover entailed cost overruns for training, caused disruptions in survey schedules, and generated delays in data processing as well as a continuing drain of skills and experience. In the same vein, reports from India inform us that in five states no less than 35 percent of the senior staff positions for monitoring and evaluation were vacant by 1982. It is therefore obvious that solving the staffing and organizational problems of evaluation units should be regarded as a high priority within the larger T & V effort.

1. Bruce R. Crouch, an Australian rural sociologist, has conducted several studies of Thailand's extension service that have generally confirmed the existence of the same weaknesses and have resulted in valuable operational recommendations for improvement. See Crouch (1980).

RESEARCH STRATEGIES FOR MONITORING AND EVALUATION

For speedy monitoring and ongoing evaluation, it is essential to assess farmers' reaction to extension advice. There are several key questions in this respect:

- What does the experience accumulated to date tell us about the comparative effectiveness of data-generating procedures, in the context of monitoring the T & V system?
- What simple indicators should be selected for monitoring or ongoing evaluation measurements?
- What alternative data collection strategies are available and preferable?
- What combination of sample surveys and case studies is optimal?
- Is it more effective to resort to monitoring or evaluation studies with multiple objectives (covering a broad spectrum of indicators) or to carry out more limited, single-purpose studies?

Broadly speaking, one of the following two approaches are generally used: the first recommends monitoring through a combination of surveys and limited case studies (or single-issue studies); the other relies solely on large-scale sample surveys conducted with detailed questionnaires.

The experience to date has shown that the type of study most difficult to undertake is the large-scale (usually statewide) sample survey. Such surveys are usually carried out with the hope that all relevant indicators can be pursued at once through a comprehensive questionnaire addressed to a large number of respondents. This turns out to be, in many cases, more of an ambitious illusion than a realistic expectation. The kinds of resources and skills usually available to monitoring and evaluation units in extension projects are unfortunately insufficient to address adequately the complex methodological and logistical requisites of surveys.

As suggested before, at least two major difficulties are embedded in the excessive (or exclusive) reliance on large sample surveys: complexity and scale. Let us address each one distinctly.

Sample surveys tend to become overly complex and unwieldy when they are designed to generate data according to a certain hypothesized model of causal linkages. Then, they tend to cover a large number of variables necessary for proving or disproving the assumed causal linkages. Translating these indicators into instruments for data collection usually leads to long questionnaires, opens the door for many answers based on memory rather than on observed facts, and facilitates various nonsampling biases. Design complexity also creates subsequent methodological problems for data processing, analysis, and interpretation. All of these intrinsic difficulties—under usual project circumstances and constraints on the number and competence of staff—end up making such sample surveys a rather risky and uncertain tool for routine monitoring and evaluation exercises.

The difficulties arising from scale are of a somewhat different nature. There is nothing wrong as such with having large-scale sample surveys; their design and conceptual problems can be well taken care of at the current level of knowledge. However, the accuracy of survey findings is highly sensitive to correct survey implementation, and in that respect the logistical requirements of large-scale surveys are often too difficult for project monitoring units to undertake reasonably. Moreover, the larger the size of the survey sample, the higher the number of investigators needed and the bigger the logistical problems encountered. In situations when the mobility of project staff (not to say enumerators) is often impaired (for instance, by sudden lack of fuel) and the survey

timetable cannot be respected, when supervision of enumerators is weak, or when many sampled farmers are unavailable, logistical defects severely affect the ability to carry out the sample survey as designed and are likely to make the findings doubtful. Efforts undertaken with enthusiasm and high expectations along the large-scale survey line often collapse in midcourse, and the findings of the evaluation survey never arrive on the manager's desk. Or, if some final data are offered, their quality and validity are highly questionable because at one or another point along the way the methodological hurdles of the survey design have not been crossed with adequate skill.

A convincing example of the complex difficulties, high costs and staff requirements, and unavailability of results from large-scale surveys is offered by the paper describing the experience of the monitoring and evaluation unit in Thailand (chapter 12). Table 12-8 of that paper compares the costs of large-scale surveys with those of limited sociological case studies. Four impact evaluation surveys were carried out annually between 1978 and 1981 on a countrywide basis, and the cost of each one (covering each time between 3,600 and 4,000 respondents scattered all over the country) ranged from 0.6 million baht (B) to B2.4 million (for a total of over B5.2 million). The sociological case studies, which included small samples and a limited number of indicators, cost on the average only B82,000 each. Even more significant, not one of the large-scale surveys, even the ones carried out in 1978 and 1979, has yet resulted in a final report four years later. On the contrary, the sociological case studies, which were manageable, did result in final reports. It is difficult to say whether the reports on large surveys will ever be produced; but even if some data will come out later, the field situation which the findings reflect will in all likelihood have completely changed. The practical usefulness of these surveys to project management has not been proven. This is not to belittle the effort that the evaluation unit in Thailand has deployed to do its job; it simply suggests that the circumstances were not adequate for using this approach.

Excessive numbers of indicators, logistical difficulties in administering large statewide surveys, as well as methodological complexities of causal attribution and data analysis tend to be mutually reinforcing and to compound the difficulties one would normally expect in a project-based, resource-limited monitoring unit. Under these circumstances, surveys often yield unverifiable and noncomparable answers, and there is a high risk that such surveys will collapse under their own overambitious weight.

The alternative, more knowledge-effective and cost-effective approach (as suggested by experience in Thailand and in other places) would be to pursue the selected necessary indicators through several more limited—but feasible—monitoring studies. Such a realistic approach would permit the use of participant observation in some quick monitoring studies, or the use of a combination of rapid sociological case studies or special-purpose studies. These are promising alternatives to the exclusive reliance on statewide surveys. It is a mistake to put inquiries of the case study type into large-scale survey questionnaire formats. Limited, less ambitious studies have proven to be quite effective.

This was the case, in Thailand for instance, of the successful sociological-sociometric study (Sreensunpagit 1979) undertaken to monitor whether the contact farmers had been selected in line with the T & V system's prescriptions. The findings of this sociological monitoring were instrumental in replacing improperly selected contact farmers and in improving the guidelines issued by the project's management for further selection procedures.

Parsimony in selecting only essential indicators is mandatory. Indicators must have a clear correlation to the kind of monitoring study desired: studies of progress in institution building will require one set of monitoring indicators; studies on agents' performance or

on adoption rates will require other indicators and study designs. It is a common mistake to combine all the different indicators and different goals in one, huge sample survey. Doing so will only overburden the study, delay its results, complicate its procedures, and reduce the effectiveness of its findings—if the findings are ever delivered to the project management.

Monitoring and evaluation units in T & V projects should learn useful lessons from other failed experiences with similar surveys. Unfortunately the advocacy of such surveys continues, usually without realistic consideration of the resources available for carrying them out, even as sober and competent voices have strongly warned against this course:

Rural surveys are one of the most inefficient industries in the world. Benchmark surveys are often criticized and yet these huge operations persist, often in the name of the science of evaluation, preempting scarce national research resources, and generating mounds of data and papers which are likely to be an embarrassment to all, until white ants or paper-shredders clean things up. (Chambers, forthcoming.)²

The point of my warnings, however, is not to ostracize one type of study from the many techniques that could be used in monitoring extension, but to plead for congruence between scarce resources available at project level and the data-generation approach adopted.

SOCIOLOGICAL MONITORING OF COMMUNICATION NETWORKS

The sample survey also has some intrinsic, built-in limitations, which I will briefly address below. Such limitations make it impractical to pursue certain indicators that are essential for assessing extension. This is an additional reason for supplementing surveys with other types of studies better able to capture these specific indicators.

Let us take, for instance, the communication process of extension messages through village information networks. This communication process can be only very imperfectly monitored and analyzed, if at all, through questionnaire surveys on randomly selected samples.

We know that the ultimate success of the T & V extension projects is predicated upon the diffusion of improved recommendations from the contact farmers, who amount to only 10 to 15 percent of the farmers, to the remaining 85 to 90 percent of the farmers. The extension agent visits the village one day every two weeks. But diffusion processes are supposed to happen after he leaves the village. Do they? What is happening with the message during the long thirteen days when the extension agent is not in the village? What happens in terms of dissemination between two visits?

Sociological research on extension has already pointed out clearly (Roling, Ascroft, and Wa Chege 1976) that diffusion of information—from the small number of farmers who are advised directly by the extension worker to the other numerous farmers—does not happen

2. Describing further what often is happening in real life to many of these giant but useless surveys, Robert Chambers continues:

Other surveys are never processed: this is the case of the extensive questionnaire survey with the 30 pages of questionnaire (multidisciplinary, each discipline with its questions), which if asked are never coded, or if coded never punched, or if punched never processed, or if processed and printed out, never examined, analyzed and written up, or if analyzed and written up, never read, or if read, never understood or remembered, or if understood or remembered, never actually used to change action.

automatically and necessarily. Thus, it would be unwarranted passively to expect that the contact farmer will automatically become a communicator himself; specific action must be taken to motivate him for this role and to monitor his performance.

Therefore, the monitoring of T & V implementation should periodically check on whether the basic assumption of dissemination from contact to noncontact farmers is confirmed. It should inform project management about the social mechanisms of interpersonal "travel" of extension information through village networks, about the speed of communication, about obstacles, and so on.

However, by its very design a monitoring sample survey can never cover such a network entirely or in its intimate reciprocal connections. The sampling design subjects the communities and their internal networks (in which patterns of interpersonal communication and linkages are of the essence) to a selection procedure that necessarily fragments and breaks the community and the integrity of its networks. The sample survey can only provide an atomistic analysis of individuals, while the continuum of the communication channels and processes is shattered. Some "fragments" (that is, individuals randomly taken out of their communication network) are introduced into the selected sample, but the network of interacting individuals cannot be reconstructed within the statistical sample or by aggregating individual survey responses. The sample is only a mechanical aggregate of scattered respondents who, in real life, do not function as a living social group, a neighborhood, a kinship group, or other interpersonal communications systems.

In the case of extension, even more so than for other agricultural activities, following up the effects of interfarmer communications through the social-cultural networks of various interpersonal relationships is crucial to learning how farmers perceive, further transmit, and react to agrotechnical advice. Therefore, exploring certain villages and farmer groups in their entirety may offer important insights.

This can be done efficiently with low-cost, village-focused sociological assessments of extension results. Such monitoring assessments can be carried out by "sit-and-stare" participant observation studies. With brief training before field work, a participant observer would be able to assess factually whether the extension information is diffused, how, and when. He will see, for the benefit of the project manager, what is happening in the village precisely during the days when no agent visits it. Such a sociologically guided observation, using also structured or unstructured interviews, can compare the relative effectiveness of various intravillage networks and point out the most active ones as well as the bottlenecks where messages get stuck.

The potential for translating such findings into improved extension procedures is enormous and immediate. Thus, these village-centered studies would complement other evaluation instruments by capturing aspects that those instruments cannot cover and by compensating for methodological survey limitations that otherwise cannot be overcome.

AN APPROPRIATE MIX OF DATA-GENERATION INSTRUMENTS

The experience to date with monitoring and evaluation suggests that it is necessary to use a combination of data-collecting approaches. The question is what combination is adequate to reach optimal effectiveness in generating and analyzing field information and in producing quantified assessments, qualitative assessments, or both.

There are tradeoffs between approaches; no strategy is perfect, and no single strategy is the ultimate answer. There are no rigid rules for selecting among the tradeoffs between large surveys and special-purpose case studies or in-depth studies. The best strategy is the

one that best uses the monitoring and evaluation resources available at a given moment in a certain project. If the resources are limited, then the strategy should also be limited. If the design for monitoring and evaluation is overambitious, given the limited resources typically available in the average monitoring unit, it will fail. Granted, these units are only beginning, and one can expect them to grow, to become stronger and better able to undertake more complex surveys. Sets of comparable in-depth, sociological case studies, however, appear now to be much easier to design and carry out. They present fewer logistical difficulties; both in-depth and aggregated results can be made available more speedily.

A promising combination of studies was adopted as the monitoring and evaluation strategy for the recent World Bank T & V extension project in Kenya. The evaluation of the extension program in Kenya will be made in terms of adoption rates (that is, the proportion of farmers who adopt and continue to adopt the extension recommendations). Its rationale is the following: if first-time adopters continue to apply the recommendations in the next year, this testifies that they consider the recommendations sound. Extension can thus be evaluated as successful. The data will be collected through a combination of limited surveys (sixty farmers per division) and sociological community studies. The primary objective of the surveys will be to act as an early warning device to inform management where and when target adoption rates are not being met, but the surveys will not aim to find out the causes for which farmers are not responding to the program. This latter objective is covered by the special community studies, which will be the "second line of inquiry" used to indicate why farmers are reacting the way they do. The village studies, using a rather more free-ranging case study approach, will investigate how the farmers are interacting; the studies will probe the attitudes of the farming community to the T & V project, so as to identify internal or external constraints to the project's effectiveness.

MANAGERS AND EVALUATION

The success of monitoring, however, ultimately depends not just on the approaches through which data are collected, but also on the actual use (as opposed to sheer disregard) that project managers make of the findings.

The manager of an extension service (or project) can play a crucial role in monitoring and evaluation. He needs the findings of monitoring for managing his cadre of extension agents effectively. Therefore, his role can be at least threefold.

- He can guide the monitoring and evaluation efforts toward the in-depth analysis of both positive and negative local experiences that are relevant for the entire system.
- He can promote openness and receptivity among his staff to the signals emerging from monitoring and evaluation.
- He can promptly translate the findings of monitoring and evaluation into managerial decisions and prescriptions for service improvement.

Thus, the project manager's genuine and trusting cooperation with the monitoring and evaluation units is essential.

During the Chiang Mai Workshop debates, two definitions were offered of what a "manager" is. One is that the manager is a person who hires and fires; another is that the manager is a person who causes things to happen. If our efforts in agricultural extension are to succeed, I would hope that managers of extension projects will not be seen as the

persons who merely hire and fire evaluators, but as the persons who cause monitoring and evaluation to happen.

REFERENCES

- Cernea, Michael M., ed. Forthcoming. Putting People First: Sociological Variables in Rural Development Projects. Baltimore, Md.: Johns Hopkins University Press.
- Cernea, Michael M., and Benjamin Tepping. 1977. A System for Monitoring and Evaluating Agricultural Extension Projects. World Bank Staff Working Paper no. 272. Washington, D.C., December.
- Chambers, Robert. Forthcoming. "Shortcut Methods in Information Gathering for Rural Development Projects." In Cernea, ed.
- Crouch, Bruce R. 1980. "Extension Organization and the Farm Community." Canberra: Australian Development Assistance Bureau.
- Israel, Arturo. 1982. "The Training and Visit System: A Warning." Paper presented at Chiang Mai Workshop.
- Roling, N., J. Ascroft, and F. WaChege. 1976. "The Diffusion of Innovations and the Issue of Equity in Rural Development." Communication Research, vol. 3, no. 2.
- Slade, R. H., and Gershon Feder. 1981. "The Monitoring and Evaluation of Training and Visit Extension in India: A Manual of Instruction." New Delhi: World Bank Resident Mission. Processed.
- Sreensunpagit, Adisak. "Selection and Utilization of Contact Farmers." Bangkok: Department of Agricultural Extension, November. Processed.

Issues and Prospects

Strengthening Extension for Development: Current Issues and Prospects

Michael M. Cernea, John K. Coulter, and John F. A. Russell

Through the views and experiences of field practitioners, this volume has endeavored to review the strengths and weaknesses of the Training and Visit (T & V) extension system and why the system is proving particularly successful in parts of Asia. This concluding chapter attempts to sum up current issues in the system's use, its relevance to other areas, and its possible adoption elsewhere. It also discusses the problem of maintaining the system's dynamism and of determining its further evolution.

Since the system has only been applied over the past decade—although it brings together many principles that have been key tenets of extension work for a long time—it should be not surprising that this summary poses more questions than it answers. By so doing, it is hoped that it will stimulate existing extension service managers to experiment with and to evaluate the suggestions made, and to spur academic researchers to carry out studies in those areas where knowledge is still limited.

OVERVIEW

The introductory chapter stressed the need to remember that extension is only one of a number of factors that contribute to increased farm productivity, and not one of the essential ingredients—improved technology, available inputs, and attractive markets—at that. The potential effectiveness of extension thus has to be related directly to the nature and provision of these other factors of production. Where they are readily available, impact can be great. Where they are weak, they have to be strengthened simultaneously with extension, and extension impact is likely to be initially more modest. This is a key consideration in designing extension projects, and in deciding whether projects that solely address extension are appropriate instruments for development in many areas.

As has also been discussed in chapter 1 of the volume, the major reason for the success of the T & V system in India is that extension had become a weak link in the integrated approach to development. The system in India, however, represents a radical departure from the previous multipurpose approach to agricultural extension (Benor and Harrison 1977). There is no doubt that it has resulted in the development of more dynamic links between farmers, extension staff, and research workers, particularly as a result of increased extension and research contact. Extension workers are now better able to match input availability and economic constraints of farmers and to advise on how to increase the efficiency of these expensive inputs through improved management practices and cropping sequences. Introduction of the system, however, has had its problems.

Note: The authors express their gratitude to participants in the Chiang Mai Workshop, whose papers, field experiences, and comments during the workshop have been of considerable help in preparing this overview.

Implementation has been more complex and difficult than at first envisaged, and in several areas the reallocation of extension staff has been a politically contentious issue. It is certainly more costly than earlier approaches, although its greater effectiveness undoubtedly offsets the cost increments. Total benefits are difficult to measure in respect to how much should be attributed to different factors, and there is a need to investigate this issue of costs and returns further. (We would like to see much more detailed information on this topic produced and analyzed in the near future.) The efficacy of the system and its widespread acceptance in India has to be regarded as a major achievement, but it is not as well accepted or established in some other countries. A deeper review of some of the issues should help to throw light on conditions needed for the system's success, its compatibility with other systems, and the appropriateness of adaptations needed for varying conditions.

At the initial stages of strengthening any extension system, it is vital to understand clearly the structure that is already in place and to identify the constraints and potential for its improvement. It is also essential to try out changes on a pilot basis, to iron out problems, and to test the efficacy of such changes before replicating them on a wider basis. Undoubtedly some disappointments with the T & V system have resulted from regarding it as a panacea; from failing to appreciate the time it takes to change the working methods, procedures, and attitudes of a bureaucracy; and from attributing too many possible benefits to the impact of extension alone. Impressive results from carefully nurtured pilot projects have often led to strong political pressure for immediate wide replication, without time for sufficient orientation and training of all parties concerned. Such pressure has been responsible for many of the problems that have been and are still being faced in a number of countries.

Face-to-face contact with the village-level worker is particularly important when agricultural communities are still emerging from subsistence agriculture, when large numbers of people are still illiterate, or when the majority of farmers are unfamiliar with current technologies. Hence the value of the "classical" T & V approach, provided that it goes hand in hand with the provision of other services. Two key questions, however, emerge at each end of the spectrum:

- On the one hand, can the poorest countries (especially in sub-Saharan Africa)—with predominantly rainfed farming systems based on land of marginal production potential, where trained manpower is scarce, and with village-level workers who have only limited schooling and technical training—afford to put in place an extension service with a ratio of extension workers to farmers of perhaps 1:800? In view of the nature of the environment, likely production increases will be modest; in view of the low educational levels and the shortage of trained manpower, much time will be needed to develop a professional extension service comparable to those in some Asian countries.
- On the other hand, as farmers become involved with an increasingly professional extension service, communities become better educated, and farming becomes more commercialized, with most of the production being sold off the farm rather than retained for subsistence, cannot lower ratios of extension workers be used and more emphasis be placed on use of the media?

Regarding the first situation, common in sub-Saharan Africa, it is not surprising that an adapted T & V system has so far only been found appropriate in the higher-potential areas, such as the highland maize and coffee-growing areas of Kenya or the cotton-maize-sorghum belt of Upper Volta (Russell 1981). Certainly an extension service can be effective only if there is some useful improved technology to extend to farmers so that

production can be increased and profitably marketed. More means must be explored to reduce costs of village-level workers as well as to ensure that their training is adequate.

One solution is for farmers to select their own village-level worker for training, and even to pay part, if not all, of his salary. This system has the advantage of reducing the high cost of housing provided by some governments for village-level extension staff. It also ensures that the worker is accepted by the community, although he could also be unduly pressured by certain groups within it. What is needed is more analysis of examples of where variations on and within the system have been tried and with what results.

At the other end of the spectrum, as the sophistication of both farmers and extension staff evolve, more can be done through the media for supporting the village-level workers in their dissemination efforts among farmers and their associations, thereby reducing the number of field staff. The synergistic use of radio and regular contact can be made at all stages, especially where local radio stations exist. It can clarify "impact points" for farmers, improve the village workers' credibility, and also be adapted to help train field staff themselves. It appears that, in general, better and more effective use can be made of this medium. More studies are needed in this sphere on the lines of the successful three-year Basic Village Education Project in Guatemala, which compared the use of radio with varying levels of extension and which was carried out by the Academy for Educational Development and the University of South Florida (1978).

TECHNOLOGY GENERATION

The Asian experience emphasizes that no extension system can continue to have an impact unless it is capable of imparting improved technology that is relevant to farmers' needs and is adapted for farmers with varying resources and for different agroecological zones. This requires good links with research. In many cases, these have traditionally not been present, especially where research and extension are in widely separated organizations, as is commonly the case.

Three major themes on technology generation emerged from the Chiang Mai Workshop: properly focused and well-conducted research is a prerequisite for effective extension; higher priority needs to be given to the technical problems of rainfed farming; and feedback from farmers and extension staff is essential to ensure that research focuses on farmers' problems.

Research plays an essential role in the T & V system. The system itself has a built-in potential for rapid feedback from farmers that puts pressure on research to be more responsive to their needs. Participation from research workers is required at the outset in assisting extension staff to identify the most appropriate impact points for the initial seasonal programs and, subsequently, to evaluate and revise the impact points each season according to farmer response. Diagnostic surveys by teams of competent staff provide an appropriate methodology for this approach, which is now being introduced in some of the Indian states, in Thailand, and in Indonesia. The results of this exercise, besides helping to strengthen the links between research and extension staff, add a new element to the planning of the following year's extension, adaptive, and applied research programs to supplement the results of trials and the feedback coming routinely through extension staff.

The whole relevance and effectiveness of extension revolves around well-chosen and appropriate impact points. Careful monitoring of these and of whether they are revised each season helps to measure performance and to ensure that the system remains dynamic. Participation in technical advisory and planning committees, the conduct of

monthly training for Subject Matter Specialists (SMSs), and shared responsibility for adaptive research all forge stronger links between research and extension. In India, initial concern on the part of researchers at having to undertake new duties is evolving into much closer working relationships—with the result that recommendations are more fully adapted to farmers' needs. Experience clearly shows the value and vital need for these improved research-extension linkages and also demonstrates the length of time it has taken to achieve them.

Solutions to the technical problems faced on rainfed farms, due to the vagaries of the weather, are especially needed by the small, resource-poor farmer. It is mainly due to the focus on such problems that farm-systems research has evolved over the last decade. With multicrop rainfed farming systems, recommendations for each crop must be adapted to its place in the farming system and to the relative importance the farmer places on the crop. Research has traditionally emphasized increased grain yield, but whether the crop is principally for subsistence or for ground cover, fodder, or rotationally improved fertility has to be considered when farming recommendations are formulated and research programs designed. Resource-poor farmers are also almost always interested in improved stability of yield rather than in potential higher yield, especially under high-risk production conditions. The farm-systems approach specifically aims to identify farmers' priority problems and to find solutions that farmers are likely to be willing to spend their money and time to implement.

The importance of the farm system to the farmer is neatly captured by M. P. Collinson (1982, p. 12), who writes:

- (1) The existing farming system is a manifestation of a weighted interaction between natural, economic, and cultural circumstances and his [the farmer's] own priorities and resource capabilities. The present farming system reflects, better than any single criterion, the balance of factors important in identifying homogeneous groups of farmers.
- (2) Farmers operating a similar system have similar problems and development opportunities.
- (3) The existing farming system is the starting point for development—the base onto which productivity improvements have to be grafted.

Thus, an understanding of the various farming systems helps the extension worker both in identifying his different farmer groups and, in light of this, in defining appropriate recommendations for each of them. It also helps both the extension and the research worker jointly to identify farmer problems that may require the application of already available, relevant research results or adaptive trials, or the need for a longer-term applied research program.

In the context of rainfed farming, it is likely that a range of different recommendations will be needed for different types of farmers and for variations in weather conditions as the season progresses. As extension workers become more experienced—backed up by relevant applied research, further training, and intelligent supervision—they become increasingly competent to make such recommendations. Such skills, however, require a good understanding of farm systems and of farmer constraints. Extension programs will therefore benefit by encouraging greater farmer participation, thus adding a third dimension to the research-extension linkage. This point is stressed because it is here that existing T & V services are often still weak and still too "top-down" in their approach. It is only with a more participatory approach that both research programs and extension recommendations can be made more relevant to farmers' needs. Existing methodologies for developing the use of the farming-system approach for better research and extension

are extremely variable in both quality and effectiveness, and more analytical reviews of such approaches would be welcome.

Experience with the T & V system has also shown that the SMS plays a crucial role in the system. He is the key link between research and extension, and he both designs and carries out the training of all field staff. He is generally expected to spend a third of his time conducting training; a third of his time liaising with research staff and preparing training materials; and a third of his time in the field giving guidance to staff, obtaining a better understanding of farm systems, and receiving feedback on the efficiency of the selected impact points. Part of the time spent with research and in the field will also be concerned with planning and executing, jointly with research and field extension staff, a program of adaptive on-farm trials. This, then, is a very demanding task, and a number of different skills are required to perform it well. Undoubtedly, the more effective the SMS, the better the quality of extension. It is vital that he has the time to get out in the field to check on the usefulness of his training material and to obtain a clear understanding of farmers' constraints. In several projects, SMSs have been given too many reporting requirements that cut down on their field visits. This leads to reinforcing a top-down approach in the research-extension linkage. More exchange of experience is needed on the key qualities sought in selecting SMSs, on the way they conduct their demanding work schedule, on the most appropriate format for training them at monthly meetings and elsewhere, and on their role in conducting adaptive trials.

In summary, constant attention to technical messages and their continuous upgrading is vital to maintaining a dynamic system. Hence the need to involve research workers more actively with farmers' problems, and to upgrade the whole farming context. In this way a full range of relevant recommendations can be made from which the farmer can choose those which best suit his individual circumstances.

SOCIOLOGICAL ASPECTS OF THE KNOWLEDGE-TRANSFER PROCESS

The transfer and diffusion of new agricultural technologies is, to a large extent, a cultural communication process intended to result in economic change. The extension service is the organizational vehicle of technology transfer and is designed to be an effective carrier of messages communicated both ways.

The main actors in this transfer process under the T & V system are the extension worker and the contact farmer: both are transfer agents at the grass roots. Significant new aspects, as well as new queries, regarding their roles during this organized communication process have come up during the workshop. These queries have been addressed both to practitioners of T & V extension and to sociologists and other social researchers who study extension, communication, and adoption processes. It may therefore be useful to discuss some of these questions briefly.

Although the T & V system is sometimes perceived as an organizational pattern which just multiplies field agents, its genuine priority is not to increase their number but to use them better. Since servicing large numbers of small farmers is costly, rarely can a country afford to have more than one Village Extension Worker (VEW) for 600 to 1,000 farmers. Furthermore, the stronger the participation of the beneficiaries themselves in all aspects of a program, the more successful the program is likely to be. Hence the importance placed in the T & V system on contact farmers and on using existing group structures whenever feasible.

How, then, can the quality of the transfer agents and the content of the transfer process be further improved? A better use of the field workers as transfer and change agents can

be achieved not only through compelling visit timetables and well-focused impact points for visits, but especially through the education and training of the agents themselves. Regular visit schedules are essential to develop a continuing and growing relationship between staff and farmers, and from the farmers' viewpoint this has been one of the most welcome features of the system. But if good training is provided, the regular visits themselves will have a richer content.

A lesson which can be derived from the Asian experience is clearly that the training of the VEWs should not focus only on the technical message to be transferred, as was often—but mistakenly—understood and done. Most agents also need to learn more about “their” farmers, “their” farm system, the ecological characteristics of “their” area—particularly about the farmers' behavior and reasons for doing things the way they do.

As we have already concluded in the discussion of the research-extension linkage, in many national extension services the single most important and immediate need is to improve the agents' practical understanding of the local farming practices and farming systems. Without this it is difficult to select appropriate impact points and to prepare and present technical messages that are immediately appealing and useful to the farmer. Furthermore, even when the field agent has an appropriate technical message and may be capable of explaining what the farmer should do, the agent is often unable to show the farmer how to do it.

More than anything else, the T & V extension projects aim to provide improved technical services to cultivators. The agent's understanding of his functions and his ability to give relevant advice is therefore of paramount importance to the quality of the transfer, as is his ability to relate to farmers and their culture. The superior potential of extension through agents over impersonal extension through mass media can be fully realized by continuously upgrading the field agents—their knowledge and ability to learn, to understand the farmer and his individual constraints, and to find individualized solutions.

Extension agents are not, however, usually trained in farm management or the commercial aspects of farming; nor do they necessarily have a good understanding of the sociology of the community and of the village communication networks.¹ Furthermore, due to SMSs' lack of skills in these areas, the fortnightly training seldom addresses these aspects. The staff of many extension services—the services only recently reorganized and often staffed with new agents—need time, motivation, and guidance to become aware of the farmer's situation or needs and to understand why he farms as he does or the local soil conditions with which he must contend.

The opportunities to learn are all around, yet agents often do not acquire the necessary knowledge. There are many extension services where the managers have simply not asked their field agents to learn systematically about and from farmers or to study in detail what farmers do and how they do it. They have been asked to press certain nationally determined and regionally mandated impact points and to report back in detail on success or failure in this respect alone.

One example came up during the workshop. In a particular scheme, some village workers on their own initiative worked with irrigation officials to improve in-field water management for the dry-season peanut crop. They were subsequently chided by their superiors at the fortnightly meeting for not pushing the nationally mandated impact

1. As was pointed out correctly (Masefield 1976, p. 30), “for almost fifty years now, lip-service has been paid to the idea that agricultural extension workers in developing countries should have some awareness of the anthropological circumstances surrounding them. Some of the effects of the anthropological situation on extension work are so obvious as to be immediately apparent.”

point—dry-season mushroom production. Other examples emphasize how crucial it is for agents to grasp both the sociology and the technology of the farming systems that are in operation in their areas. For instance, in one province of Thailand, the VEWs have been advising maize farmers on row spacing, regardless of the farmers' need to leave room for buffalo cultivation, and on timing of planting in a way which disregarded the farmers' need to adjust timing to allow relay planting with other crops.

Two other issues illustrate agents' frequent lack of practical understanding of small-farmer sociology. The first of these is the problem of technology diffusion, which is supposed to be slowed by farmers' traditional attitudes. However, Thailand's smallholder agriculture abounds with examples of very rapid diffusion. The production of cassava, for instance, went from 1 to 12 million tons in about seven years. Clearly there was little difficulty in having this crop widely and rapidly adopted by small farmers, despite their alleged traditionalism, principally because of the incentives offered by the market. Another success, this time more attributable to the extension service, has been the adoption of direct seeding of pregerminated rice in areas of good water control, which in certain areas went from 0 to 95 percent coverage within two years. Thus, it is evident that farmers can and will adopt new ideas readily; the problem is to find the right way to introduce appropriate ideas into the traditional farming system.

The second issue is the supposed lack of relevant research. Although relevant research on certain aspects may be absent, it is also true that there are many research results and new technologies waiting for adoption. The SMSs and many of the field agents are capable of understanding the published results of agricultural research, but not always their relevance. This prevents them from selecting, adapting, and tailoring research results to the needs and capabilities of area farmers. Again, this can be traced to the lack of sufficient knowledge of the local farmers' situation.

To sum up, an important current issue for improving T & V extension is management of the extension service in a way that promotes and sustains a combination of traditional and scientific knowledge of farming at the level where extension comes in contact with the farmer. There are several options that can be considered which are not mutually exclusive but can be mutually reinforcing in an appropriate mix.

The most obvious option often is to change the agents' training curriculum to include farm management, family household needs and constraints, and the commercial aspects of farm business.

In general, two questions arise in this regard. First, how are the resources (trainers and teaching materials) to be found? The answer is often that the resources do exist within the education sector as a whole, or within the agricultural vocational training system, or within various government departments of agriculture. It is only necessary to locate and make use of them. The second question is how far such training would go toward solving the problem. Alone it would probably achieve little. Training will be effective only if the extension agents are motivated to undertake the analysis of the family farms they are servicing. The most effective approach of all would be one in which the work expectations of the extension agents create a demand for the provision of such training.

A second possible option would be to provide considerably more training on farming-systems analysis, which gets much closer to the heart of the problem. A farming-systems approach encompasses also farm management; family need, values, and customs; and commercial aspects of farming. The experience of the International Rice Research Institute (IRRI) in the Philippines suggests that about six months of training is required, although it could be given with a shorter course and regular focus at biweekly training seminars. Ideally the training should be integrated with field work and on-farm studies by extension agents.

A variant of this option would be to have the extension agents undertake simple diagnostic studies of selected farmers who are typical of the agricultural zone in which the agents work. In their doing so, it would be useful to have the extension agents distinguish between the constraints identified, new techniques developed by farmers themselves, and opportunities for adaptive research. This task could be organized along the same lines as the present fortnightly training. For this purpose, agents could work as a group, under the direction and guidance of SMSs, and the occasion should also be an opportunity for mutual reinforcement and sharing of recent experiences "on their rounds." If the information from such studies is properly analyzed, it will prove useful for tailoring advice to the abilities of the given family farms, for evaluating the worth of current agricultural research, and for setting research objectives. As important in the short term would be the benefits derived from the process of investigation itself. By undertaking this work, agents and SMSs will develop their sociological, economic, and psychological understanding and knowledge of the types of family farms in their areas.

Finally, another approach to attaining the right blend of practical experience and technical know-how, at the extension services' point of contact with farmers, would be to rely more on the farmers themselves in extension work. In other words, this calls for a considerable increase of the role of contact farmers as transfer and change agents in the overall T & V strategy. The potential of contact farmers as transfer agents within the T & V extension approach is considerably higher than what seems to have been their actual performance to date.

Further dissemination by contact farmers of the advice given by T & V field agents is a fundamental premise on which the entire T & V system is built; contact farmers are expected to pass the recommendations received to large numbers of noncontact farmers. If this does not happen, as it has been observed in some places, the effectiveness of the entire system is sharply curtailed. It is true that the prime function of the contact farmer is to demonstrate the results of improved technology by using it in his fields. The message can thus pass visually with little or no discussion (although counting only on autonomous diffusion processes is not a very dynamic and realistic position). It appears, however, that in many cases more could be achieved if the T & V field agents encouraged contact farmers to pass the information on to others actively. Their ability to do this will vary in different social circumstances, and we need to know much more about how and when farmers learn about and decide to use new technology on their farms. Quite often, contact farmers limit themselves to a narrow performance of their transfer function rather than fulfill their broader role as change agents.

Only by looking beyond the transfer activity—namely, at whether significant changes are triggered by their transfer effort—would the extension agents be able to increase the overall impact of extension. They should feel responsibility for guiding "their" contact farmers into being dissemination agents, for following up on the issues that may come up, and for backstopping contact farmers as the need arises.

There are also some other options available to extension managers to monitor, support, and expand the role of contact farmers. First, the selection of contact farmers is critical; it is necessary to ensure, through contact farmers, open "entry points" to various subgroups and strata of the village population, to various field neighborhoods, and to various ethnic groups or castes. Selecting contact farmers within the different village networks is of strategic importance.

Success in dissemination will vary in large part according to the sense of community in an area, whether villagers are closely knit and have a history of communal decision-making, as they do in parts of Indonesia. In such communities, gradual and sometimes even rapid adoption by all farmers often follows once one farmer adopts an improved

practice. Conversely, adoption may be slow where communities are loosely integrated, as is often the case in India, where caste and social differences may divide a village into disparate groups, some of whom will be bypassed if agents are not astute in selecting contact farmers. Extension services using the T & V system are being increasingly careful to stratify farmers accurately; nevertheless, key factors may well be missed if different farming systems are not also taken into consideration. Thus, in one area contact farmers were carefully selected to represent different sizes of farms—a key indicator of varying resources. This criterion alone was insufficient however, in that every contact farmer had irrigation, but only 40 percent of all village farmers had irrigated land. In these circumstances what was needed (and what has subsequently transpired) was that contact farmers should have included representatives with farms of different size from three groups: farmers with only irrigated land, farmers cultivating both irrigated and rainfed land, and farmers with access only to rainfed land.

Extension managers also have the alternative of replacing certain contact farmers if, after a reasonable period and despite service support and advice, the contact farmers appear incapable of, or not interested in, disseminating received information to others. Regular extension support is a commodity offered free to contact farmers, and the way for them to contribute is to support the system in turn. Managers also have the alternative of considering rotation patterns, assuming that good contact farmers, after three to four years of being regularly visited by the agent, are likely to remain in touch with him even if other farmers are invited to become contact farmers. If such rotation is carried out with community participation and assent, it is likely that direct extension service will increasingly be perceived as a valuable benefit in which all have the right to share and something important to gain. (Further interesting discussion of the role of contact farmers can be found in Howell 1983, pp. 10-14.)

All in all, the attention of managers should be continuously focused on the transfer processes— not just between agents and contact farmers, but between contact and other farmers—after the agent departs from the village and before he returns two weeks later.

The likely development of extension work under the T & V system appears to indicate a need for more sociological and communication research on extension processes. Since interest in “diffusion of innovation” theories and research peaked in the late 1960s and early 1970s (Rogers and Shoemaker 1971), motivation for the sociological study of extension has unfortunately dropped quite low. The progress of the T & V system opens up new and very attractive areas for direct study by sociologists and communication and extension scholars (Cernea 1981). However, despite the rapid expansion of the T & V approach and the structural reorganization of many national extension services along T & V lines during the past six to eight years, so far the sociological community has, by and large, neglected the empirical study of this approach and its effects.

Little theoretical progress has been made, for instance, since the famous two-step model of communication flow was developed, although new empirical material is available for conceptualization and for refining this model. Recently, some sociologists have suggested to modify the two-step concept by including in the communications model marginally positioned individuals (as opposed to the so-called opinion leaders), and the “bridging function” of marginals in the flow of information has been pointed out (Weimann 1982). Such hypotheses may turn out to be operationally relevant for dissemination strategies. Sociological research on the diffusion and adoption of innovations has focused primarily on adoption by individuals (as predicated in the T & V approach as well), whereas collective adoption of innovation has received far less attention from the social research community (West 1983). The role of groups, and group building through extension, promises to be an interesting area for further research. The concept and practice of the

“contact group” might be explored and practically tested as well. Several sociologists have urged over the past few years the undertaking of comparative analyses of the effectiveness of alternative approaches in agricultural extension (Garforth 1982; Roling 1982), yet no empirical comparative studies have been carried out.

Altogether, extension practitioners express a need for more operational support from sociologists and other behavioral researchers able to contribute to effective communication and transfer of technological messages.

EVOLUTION OF THE TRAINING AND VISIT SYSTEM

It is now recognized that a time horizon of at least ten to fifteen years is needed to establish an effective T & V system of extension because of all the changes in procedures, attitudes, incentives, and interrelationships that the system typically requires. All country representatives at the Chiang Mai Workshop stressed the need for initial pilot experiences from which to derive appropriate adaptation of the system for their conditions. Such experiences are also needed to convince senior officials in all branches of government concerned, thereby to obtain their full commitment to the system. Good leadership from key staff introducing the system has been another vital ingredient of success. Orientation training has been found necessary for all staff directly involved, as well as for local administrators and staff of other agencies (such as those for credit and input supply) concerned with agricultural development. This is needed not only at the outset but on a continuing basis, especially in view of the relatively frequent staff transfers that occur in many places.

The need for improved supervision of all grades of staff is also important as the nature of supervision changes to giving guidance, and recognition where due, rather than using an “inspectorate” approach based on office- and time-bound reporting schedules. Such changes take time to bring about, since a prerequisite for more field-based supervision is the deliberate reduction of reporting requirements, together with changes in staff attitudes and incentives.

Considerable debate has taken place on whether agents should concentrate wholly on their extension function or should become involved in such functions as marketing, input supply, and credit, and, if the latter, to what extent (Howell 1983, pp. 7-10). There are two key points here: first, that weakness in any one of these services will impair farmer production, and good extension without other key support services has little effect; second, that concentration on the extension function by the VEW ensures a more professional extension service. The apparent conflict can be resolved when it is recognized that the VEW must liaise with the staff of these services, know how the services are provided, and advise farmers how best to avail themselves of these supports in production activities. As a general rule, extension management must take the lead in seeking the support of allied departments in broadening the base of extension activities to suit farmer needs.

Once the framework of the system is well established—with strong internal support and commitment and good liaison with research facilities, agricultural universities, and other support services—it must both evolve and remain dynamic. This calls for good leadership and innovation, for although certain basic tenets cannot be altered, there is much opportunity for adjustment to suit local conditions. A system that has been initiated on recommendations for a few key crops has gradually to integrate with all farm-based production activities and thus assist the farmer with his whole farming enterprise. This, in addition to field crops, may variously involve activities concerned with animal

husbandry, fishery, farm forestry, or horticulture and may include techniques associated with improved soil and water management. SMSs in these fields can gradually be introduced into the service depending on the relative priority of their skills in the farm systems in each ecological zone, and Agricultural Extension Officers (AEOs) and VEWs will themselves thereby become increasingly more professional and able to give advice on a wider range of topics. At the same time as the farmer becomes more sophisticated, greater use can be made of the media, and fewer VEWs are needed. As development proceeds, more farmers begin to come into direct contact with specialists and AEOs or VEWs, who can increasingly be characterized as Farm Management Advisers. Different agricultural regions of the world are already in these varying stages of evolution, and for each stage a different style of extension is relevant. In any of these, effective management is particularly important, and to be most effective it must adapt to reflect the needs of local conditions—coordinating with the required support organizations and taking maximum advantage of the broad strengths of the T & V system.

Considerable debate is under way about the best way to ensure rapid feedback to management of the results of monitoring and of short-term evaluation while recognizing the need for longer-term evaluation for both planners and policymakers. Monitoring and evaluation of T & V extension requires individual treatment for the two essential components of the system: the message, and the medium for transmitting the message. The messages are the impact points, and, as has already been mentioned, a first need is to monitor them for relevance and for changes over time to see how responsive the program is to identifying and resolving farmer constraints.

Monitoring of the medium—that is, the operational efficiency of the extension service—can be effected by measurement of both the delivery system and sustained adoption rates. Such rates measure the ability to reach the right farmers and to obtain their confidence. Effectiveness of the message quality can be measured by voluntary sustained adoption rates—farmers being rational operators, such repeat adoption provides a plausible inference that they have detected tangible benefits from adopting the recommendations. Thus, adoption rates are the prime indicators for monitoring and evaluation of T & V systems once impact points have been agreed upon as fully relevant.

To measure impact by quantitative estimates of incremental yields attributable to the T & V system presents a more difficult problem. Such data have an important role in evaluation, but the ability to carry out large-scale probability sample surveys involving crop-cutting of randomly located subplots will vary from country to country and, in any case, may be appropriate only for densely planted, pure stands of selected crops. More in-depth studies to obtain detailed records from a limited number of farmers and fields selected in a purposive manner and more sociological case studies based on “sit-and-stare” participant observation may be a practical approach in certain circumstances (Cernea and Tepping 1977). Furthermore, improved practices may be needed to maintain yields at their present level in view of soil degradation or pest attacks, and recommendations may often be designed for more stable yield rather than for increased yield. In these cases evaluation will not be attempting to measure production variations. Competent interpretive analysis has to be provided on each season, together with yield and production data, when one is trying to evaluate extension impact.

Deeper insights into the penetration of the T & V system and the reactions of beneficiaries to it can be obtained through the use of special small-scale sociological studies, including approaches that use participant observation. Rapid appraisal studies, if carried out by experienced observers and interviewers, may also provide substantial information on beneficiary behavior and reaction, although these techniques may lack the underpinning of statistical confidence provided by more formally designed surveys.

Monitoring and evaluation has first to monitor the impact points themselves, then the delivery system and adoption rates (in particular, sustained adoption). Finally, an overall impact assessment has to be made. Each of these activities requires an appropriate blend of rapid appraisal, probability sample surveys, and in-depth case studies—not just one of these techniques to meet all purposes. Evidence now emerging from a variety of experience with monitoring and evaluation of T & V extension in a number of countries should help extension staff to make the right combinations in varying country circumstances.

It seems timely that there should be more debate on the role, methods, and experiences of agricultural extension. This paper has tried to show that there is likely to be a great variety of appropriate approaches depending on a country's resources, its farming systems, and the relative accessibility, educational standards, and sophistication of its farmers. The T & V system is one such management approach that has much to commend it, and one that has been especially effective in the Asian context. Its adaptability for other areas has been discussed, as have the pitfalls of adopting the T & V framework as a panacea for all extension needs in all contexts. Agricultural development will certainly benefit from further debate on this subject.

REFERENCES

- Academy for Educational Development and University of South Florida. 1978. "The Basic Village Education Project, Guatemala: Final Report." Washington, D.C.: U.S. Agency for International Development, September.
- Benor, Daniel, and James Q. Harrison. 1977. Agricultural Extension: The Training and Visit System. Washington, D.C.: World Bank.
- Cernea, Michael M., and Benjamin Tepping. 1977. A System for Monitoring and Evaluating Agricultural Extension Projects. World Bank Staff Working Paper no. 272. Washington, D.C., December.
- Cernea, Michael M. 1981. "Sociological Dimensions of Extension Organizations: The Introduction of the T & V System in India." In Crouch and Chamala 1981, vol. 2.
- Cochrane, Glynn, ed. 1976. What We Can Do for Each Other: An Interdisciplinary Approach to Development Anthropology. Atlantic Highlands, N.J.: Humanities.
- Collinson, M. P. 1982. Farming Systems Research in Eastern Africa: The Experience of CIMMYT and Some National Agricultural Research Services, 1976-81. International Development Paper no. 3. East Lansing: Michigan State University.
- Crouch, Bruce R., and Shankariah Chamala, eds. 1981. Extension Education and Rural Development. 2 vols. Chichester, U.K.: John Wiley.
- Garforth, Chris. 1982. "Reaching the Rural Poor: A Review of Extension Strategies and Methods." In Jones and Rolls 1982, vol. 1.
- Howell, John. 1983. "Strategy and Practice of the T & V System of Agricultural Extension." Agricultural Administration Network Discussion Paper 10. London: Overseas Development Institute, February.
- Jones, Gwyn E., and Maurice J. Rolls, eds. 1982. Progress in Rural Extension and Community Development. Vol. 1. Chichester, U.K.: John Wiley.
- Masefield, G. B. 1976. "Anthropology and Agricultural Extension Work." In Cochrane 1976, p. 3.
- Rogers, E. M., and F. F. Shoemaker. 1971. Communication of Innovations. New York: Collier Macmillan.
- Roling, Niels. 1982. "Alternative Approaches in Extension." In Jones and Rolls 1982, vol. 1.
- Russell, John. 1981. "Adapting Extension Work to Poorer Agricultural Areas." Finance & Development, vol. 18, no. 2 (June), pp. 30-33.
- Weimann, Gabriel. 1982. "On the Importance of Marginality: One More Step into the Two-Step Flow of Communication." American Sociological Review, vol. 47, no. 6.
- West, Patrick C. 1983. "Collective Adoption of Natural Resource Practices in Developing Nations." Rural Sociology, vol. 48, no. 1.

Participants in the Chiang Mai Workshop

INDIA

N. N. Mehta, Additional Director of Agriculture (Extension), Madhya Pradesh
B. M. Raina, Additional Director of Agriculture (Extension), Rajasthan, Jaipur
A. S. Rama Rao, Additional Director of Agriculture (Extension), Orissa, Bhubaneswar
C. S. S. Rao, Joint Commissioner (Extension), Ministry of Agriculture
G. Ranga Rao, Director, Department of Economic Affairs, Ministry of Finance
C. Linga Rai Urs, Additional Director of Agriculture (Extension), Karnataka, Bangalore

INDONESIA

Z. Hasibuan, Assistant to Project Director, National Agricultural Extension Project II
Arifien Moekaddas, Agency for Agricultural Education, Training, and Extension
P. Mudjiyo, Head of Extension Department, Gajah Mada University
M. Nurgaybita, Inspector of Agricultural Services, West Sumatra
Effendi Salam, Inspector of Agricultural Services, East Java
D. G. Sukaryo, Assistant to Project Director, National Agricultural Extension Project II
Ruyat Wiratmadja, Director, Project Implementation Unit—Extension, Agency for Agricultural Education, Training, and Extension
Soenarso Wirjoprajitno, Project Director, National Agricultural Extension Project II

NEPAL

R. C. Mishra, Project Coordinator, Agricultural Extension and Research Project

PHILIPPINES

Romeo V. Aquino, Regional Director, Ministry of Agriculture, Western Visayas
Manuel Bonifacio, Professor of Sociology and consultant, Bureau of Agricultural Extension
Jindra L. Demetrio, Integrated Agricultural Product Marketing Project, Bureau of Agricultural Extension
Francisco G. Rentutar, Project Manager and Director, Bureau of Agricultural Extension, Manila

SRI LANKA

S. R. Arasasingham, Deputy Director (Extension), Ministry of Agriculture
S. Natesan, Deputy Director (Training), Ministry of Agriculture

THAILAND

Kasem Jarinto, Provincial Agricultural Extension Officer, Singburi
Suporn Karunpak, Provincial Agricultural Extension Officer, Chiang Mai

Sooksanti Malithong, Provincial Agricultural Extension Officer, Supanburi
Ekachai Ocharoen, Subject Matter Specialist, Planning and Special Projects Division,
 Department of Agricultural Extension
Vorasak Pakdee, Project Director, Department of Agricultural Extension
Chulhathep Pongsoyech, Planning and Special Projects Division, Department of Agricultural Extension
Thongchart Raksakul, Chief, National Agricultural Extension Project
Pisit Sasiphalin, Director General, Department of Agricultural Extension
Adisak Sreensunpagit, Chief, Monitoring and Evaluation Unit, Department of Agricultural Extension
Somsak Surawadee, Provincial Agricultural Extension Officer, Chonburi
Worawit Wittayapiman, Director, Southern Regional Agricultural Extension Office, Department of Agricultural Extension
Suwit Wiwidwon, Provincial Agricultural Extension Officer, Khonkaen

UPPER VOLTA

Sie Kam, Head, Extension Department, Haute Bassins Region, West Volta Agricultural Development Project

KENYA

G. M. Kirmani, Deputy Director, Ministry of Agriculture

UNITED NATIONS DEVELOPMENT PROGRAMME

J. Granados, Workshop Administrator, Venezuela
I. McDonald, Senior Planner (Agricultural Programs), Regional Development, Training, and Communication Planning Project, Bangkok
W. Mashler, Senior Director, Division of Global and Interregional Projects, New York
John L. Woods, Director, Regional Development, Training, and Communication Planning Project, Bangkok

UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND PACIFIC

J. B. Orsini, Agricultural Division

UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION

C. Bonte-Friedheim, Director, Agricultural Operations Division, Rome

WORLD BANK—OPERATIONS POLICY STAFF

M. M. Cernea, Rural Sociology Adviser, Agriculture and Rural Development Department
J. K. Coulter, Agricultural Research Adviser, Agriculture and Rural Development Department
G. Feder, Economist, Research Division, Agriculture and Rural Development Department
A. Israel, Implementation Adviser, Projects Advisory Staff

D. C. Pickering, Assistant Director, Agriculture and Rural Development Department
J. F. A. Russell, Rainfed Crops Adviser, Agriculture and Rural Development Department

WORLD BANK—SOUTH ASIA REGIONAL OFFICE

M. Baxter, Rural Development Officer, Agricultural Extension Projects, Resident Mission, New Delhi
D. Benor, Senior Agricultural Adviser, Projects Department
G. Galgali, Extension Specialist, Resident Mission, New Delhi
J. Hayward, Agriculturalist and Agronomist (Project Officer for Bangladesh and Sri Lanka extension projects)
J. Kampen, Agriculturalist, Resident Mission, New Delhi
J. H. Lindt, Agriculturalist and Extension Specialist (Project Officer for extension projects in India and Nepal)
C. Mathur, Extension Specialist, Resident Mission, New Delhi
P. Nottidge, Chief, General Agriculture Division (includes all extension projects)
R. Slade, Economist, Projects Department
W. Thalwitz, Director, Projects Department

WORLD BANK—EAST ASIA AND PACIFIC REGIONAL OFFICE

A. J. Davar, Chief, Resident Mission, Bangkok
S. Draper, Agriculturalist, Resident Mission, Jakarta
W. Panton, Senior Agriculturalist (Project Officer for Thailand research and extension projects)
D. Parbery, Senior Agriculturalist (Project Officer for Philippines extension project)
K. Sengupta, Agriculturalist, (Project Officer of Indonesia extension project)
K. Sigrist, Agricultural Economist, Resident Mission, Bangkok
W. Soehendro, Agriculturalist, Resident Mission, Jakarta
D. Turnham, Assistant Director, Projects Department

WORLD BANK—EAST AFRICA REGIONAL OFFICE

L. Christoffersen, Assistant Director, Projects Department (conference organizer)
N. Roberts, Agricultural Economist, Resident Mission, Nairobi

OTHER

Gershon Ben-David, Team Leader, Tahal Consultants, Bangkok
M. Blustein, Workshop Facilitator, Development of Human Systems, Israel
Glenn L. Denning, International Rice Research Institute, Philippines
Y. Elkana, Extension Service, Ministry of Agriculture, Israel
Peter Hoare, Thai-Australia Project, Chiang Mai
Suratep Paripunna, Senior Agricultural Adviser, Tahal Consultants, Bangkok
A. Peers, Senior Agricultural Adviser, Overseas Development Administration, United Kingdom

The full range of World Bank publications, both free and for sale, is described in the Catalog of Publications; the continuing research program is outlined in Abstracts of Current Studies. Both booklets are updated annually; the most recent edition of each is available without charge from the Publications Sales Unit, Dept. B, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

The editors are all advisers in the Agriculture and Rural Development Department of The World Bank: Michael M. Cernea for rural sociology, John K. Coulter for agricultural research, and John F. A. Russell for rainfed crops.



THE WORLD BANK

The World Bank is strongly committed to promoting agricultural development in its member nations—and to helping least advantaged farmers to improve their productivity. If they are to do so, small farmers must use scientifically based agricultural technologies that are suitable for their location and farming system and that have been adapted for accessibility and clear usefulness. If agricultural development is to succeed, mutually reinforcing and open communication must exist between agricultural researchers and farmers.

One of the most promising ways of achieving such communication is the Training and Visit (T & V) system of agricultural extension. This volume captures nearly ten years of experience with the T & V extension system, most of it in Asia. Five issues are addressed: farmer participation, the research-extension linkage, training, system management, and monitoring and evaluation. Within this framework, extension system managers and evaluators from six Asian countries and six discussants present their experience and analyses. Introductory and concluding overviews give the larger context for the discussion.

The valuable, first-hand experience documented here will be of use to agricultural policy-makers, project designers, rural sociologists, extension workers, and agricultural researchers.

**WORLD BANK BOOKS
OF RELATED INTEREST**

Training and Visit Extension
Daniel Benor and Michael Baxter

This comprehensive explanation of the organization and operation of the T & V system of agricultural extension was refined from a series of operational notes on the system's structure and function. Intended mainly for use by extension staff at all levels, agricultural research personnel, trainers, and administrators, it is both a methodological guide and a training resource.

A companion booklet—*Agricultural Extension: The Training and Visit System* by Daniel Benor, James Q. Harrison, and Michael Baxter—provides an overview of the system's organization and is a revised and expanded edition of the same title by Daniel Benor and James Q. Harrison published by the World Bank in 1977.

Economic Analysis of Agricultural Projects
Second edition, completely revised and expanded
J. Price Gittinger

After its publication in 1972, the first edition became a standard reference and text and the World Bank's best-selling book. This expanded edition sets out the same careful and practical methodology for analyzing agricultural investments but adds a wealth of recent project data; expanded treatment of farm budgets and efficiency prices; appendixes on presenting project preparation reports and on using discounting tables; an expanded and completely annotated bibliography; and a detailed glossary of technical terms. It is an indispensable guide, both in the classroom and at the project site.

Also available in Spanish

ISBN 0-8213-0301-5