

WTP 0192

December 1992

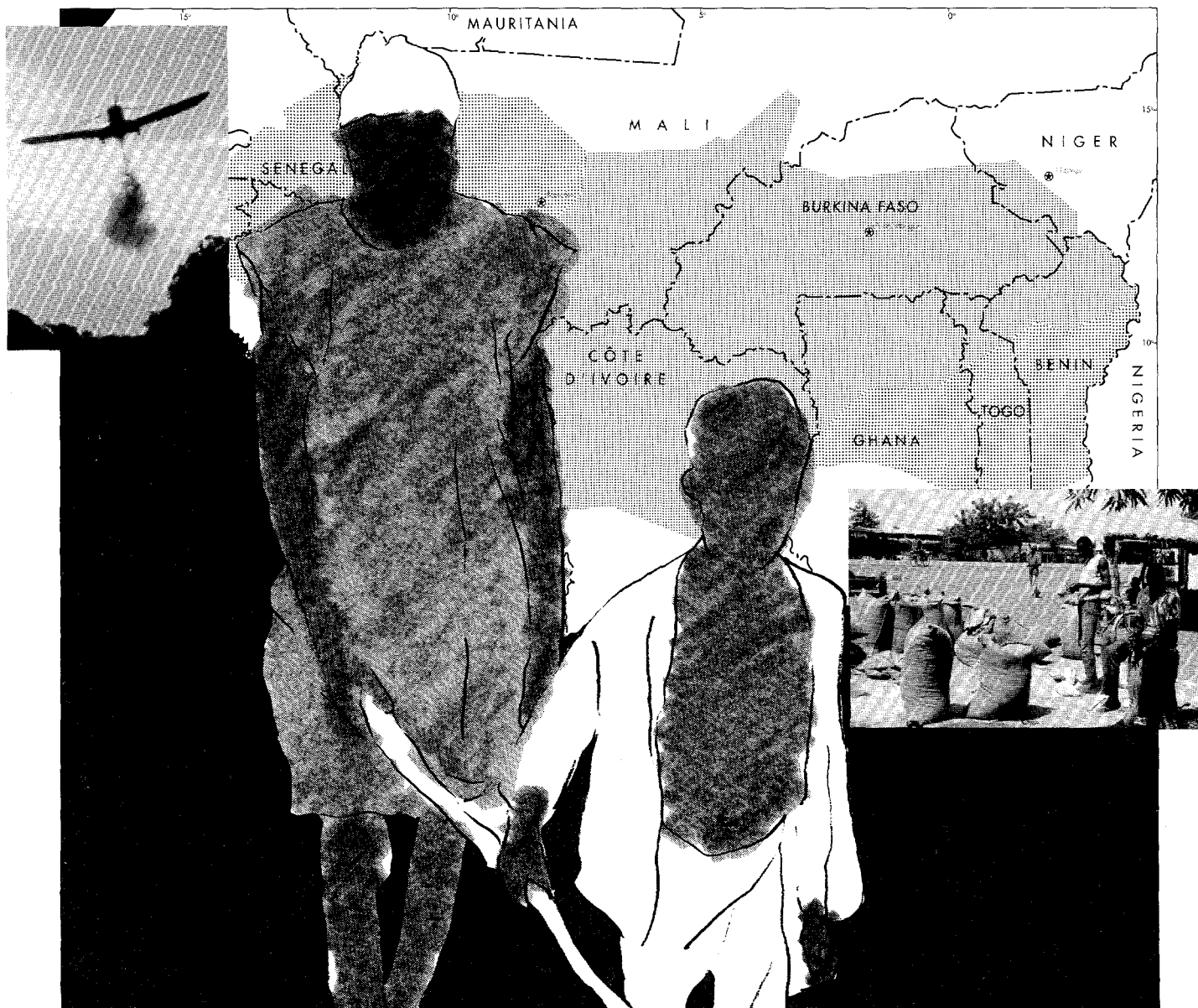
WORLD BANK TECHNICAL PAPER NUMBER 192
SERIES ON RIVER BLINDNESS CONTROL IN WEST AFRICA

Settlement and Development in the River Blindness Control Zone

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Della E. McMillan, Thomas Painter, and Thayer Scudder

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The World Bank
Washington, D.C.

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First printing December 1992

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ISSN: 0253-7494

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Library of Congress Cataloging-in-Publication Data

McMillan, Della E.

Settlement and development in the river blindness control zone /
Della E. McMillan, Thomas Painter, and Thayer Scudder.

p. cm. — (World Bank technical paper, ISSN 0253-7494 ; no.
192. Series on river blindness control in West Africa)

Includes bibliographical references.

ISBN 0-8213-2296-6

1. Land settlement—Africa, West. 2. Land tenure—Africa, West.
3. Natural resources—Africa, West. I. Painter, Thomas M., 1943–
. II. Scudder, Thayer. III. Title. IV. Series: World Bank
technical paper ; no. 192. V. Series: World Bank technical paper.
Series on river blindness control in West Africa.

HD1010.Z63M38 1992

333.3'0966—dc20

92-39287

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Foreword

This volume is the summary report of the Land Settlement Review (LSR), a regional study of land settlement in West Africa. The objective of the LSR was to examine the phenomenon of land settlement resulting from the successful control of onchocerciasis (riverblindness) by the Onchocerciasis Control Programme (OCP). The LSR analyzes the process of land settlement, both spontaneous and government sponsored, and recommends operational policy guidelines for promoting viable and sustainable settlement-related activities in the areas where onchocerciasis had been controlled.

OCP is widely acknowledged as the most successful on-going disease control program in Africa. Started in 1974 by a group of 7 West African countries and 9 donors, including the World Bank, the program has expanded to 11 countries, includes twenty-two donors and protects 30 million people. In most of the original program area the disease has been virtually eliminated and lasting control of the disease throughout the extended program area is expected to be secured around the year 2000. The health impact of the program has been significant. Nine million children born since the beginning of the program are free of any risk of contracting the disease. Over 1.5 million people who were once seriously infected are now disease free and the program will have prevented an estimated 300,000 cases of the disease by the end of this decade.

In addition to its substantial health benefits, one of the primary justifications of the program has been the substantial development potential of sparsely populated onchocerciasis endemic river

valleys. It is estimated that 25 million hectares of tillable land is being opened up by onchocerciasis control and rapid migration to these river valleys is already occurring. OCP is not directly involved in the socio-economic development of these areas, but the Committee of Sponsoring Agencies (UNDP, FAO, WHO, the World Bank), the statutory body that oversees OCP, has encouraged development in the OCP area by executing two regional studies: the first, Socio-economic Development Studies in the Onchocerciasis Control Programme Area, looked at the development potential of the onchocerciasis freed areas and the second, the LSR, examined the extent and impact of new settlement in the OCP river valleys.

The LSR, prepared by the Institute for Development Anthropology, consists of in-depth case studies of Burkina Faso, Ghana, Mali and Togo, as well as shorter reviews of settlement activities in the other OCP countries (Benin, Cote d'Ivoire, Guinea, Guinea-Bissau, Niger, Sierra Leone, and Senegal). This volume synthesizes the findings of the LSR and recommends settlement policies appropriate for the OCP area. An understanding of the settlement process and the implementation of appropriate settlement policies are crucial for the sustainable development of these newly opened areas which represent perhaps the largest area in West Africa with untapped agricultural potential.

Katherine Marshall
Director
Sahelian Department

Preface

A leitmotif in West African art is the blind old man with his lute, the *kora*, tied with a string to a child who leads him through his wanderings, trying to make a living by playing and begging. This image came into art because it has been sadly present, for decade after decade, in the daily life of vast areas of West Africa, which were affected by river blindness. I saw many such sad couples twenty years ago, when I first went to West Africa. And it has been gratifying to notice during subsequent visits, particularly in the last few years, that such sad couples have become much less frequent.

The reduction and virtual eradication of this terrible disease—onchocerciasis or river blindness—in several West African countries is an extraordinary achievement, briefly described in the present volume. This achievement has triggered, in turn, major beneficial social and economic consequences. Most important: it has opened up the vast territories freed of this disease to human settlement and resettlement. The forced outmigration from these territories, caused by the fear of river blindness, has been reversed into a large scale return movement.

The success of onchocerciasis control also became the starting point of the large-scale study published in this volume, that was carried out by a research team of the Institute for

Development Anthropology (IDA) from Binghamton, NY, with World Bank and UNDP support. The study focuses on the settlement potential of the oncho-free areas and on the social strategies that governments can adopt to assist the settlement process. It critically examines a vast body of worldwide experiences with spontaneous settlement, assisted settlement as well as government-sponsored settlement programs. The conclusions reached in the study illuminate alternative options available to governments and planners in West Africa.

The issues involved in promoting an effective settlement process range from land tenure to the development of road infrastructure, from creating drinking water supply systems to marketing networks, from school and health care to the establishment of adequately sized human settlements. Most critical is the development of viable production systems conducive to a sustainable use of the existing natural resources, with adequate environmental safeguards. These and other issues have been addressed systematically by the multidisciplinary team that carried out this research, in two stages. The first stage involved the preparation of four in-depth independent case studies, issue-focused or area-focused, in several countries of the oncho area: Burkina Faso,

Ghana, Mali and Togo. Less intensive review of settlement data, issues and existing documentation was conducted for the other seven countries of the oncho control area: Benin, Cote d'Ivoire, Guinea, Guinea-Bissau, Niger, Senegal and Sierra Leone. All these case analyses afforded an empirically based assessment of the problems at hand. The second stage consisted of preparing a forward-looking synthesis of these case studies, as well as of other relevant experiences worldwide that were previously studied by the researchers. This synthesis, which represents the final report of the entire Land Settlement Review for the oncho-freed areas, is published in this volume.

Settlement building is always a major and complex feat of human creativity, innovativeness and ability to adapt to, and control, natural environments. The key factor in any settlement process is its social actor — the population groups at work. An essential characteristic of the present land settlement review is its particular emphasis on the social actors, specifically on the social-organizational and cultural variables of the settlement process, within a broader multidisciplinary approach. This compares favorably with other settlement planning studies, which frequently underestimate the social, cultural, and institutional variables. This emphasis reflects, and was made possible by, the strong trend in the World Bank and among some other major donors, toward a firmer incorporation of sociological analysis in development policies, strategies and programming, particularly in matters concerning settlement, resettlement, indigenous populations, and overall social impact.

The team of social researchers that carried out the land settlement review was led by two eminent scholars—IDA Director for the study in the initial stage was Professor David W. Brokensha; subsequently, IDA Director

for the study was Professor Thayer Scudder, who assumed the leadership of the research team, throughout the field-work and the writing periods. The authors of the synthesis report (Della McMillan, Thomas Painter, Thayer Scudder) have produced an exemplary study, with both analytical and practical value. Prior to publication, the study was discussed in depth by, and enriched with the suggestions of, experts representing the governments of 10 West African countries that attended an international seminar in Ouagadougou, where the draft version of the study was presented. On the World Bank's side, Bruce Benton, Scott Guggenheim, Florent Agueh and Nicole Glineur coordinated and advised the work of the settlement review team.

The publication of this final version of the synthesis report opens the present series of studies on River Blindness Control in West Africa, to be published by the World Bank. The series will continue with the publication of other studies resulting from the land settlement review and from other research on resettlement.

In publishing this important study, and indeed in launching the publication of an entire series of studies on river blindness control and its socioeconomic aftermath, the World Bank intends to broaden the public debate about how best to use the developmental potential of the areas freed from onchocerciasis, through adequate human settlement and sound environmental management.

Readers' comments on these studies, and on how to design the most appropriate settlement policies and operational approaches, are encouraged and eagerly invited.

—*Michael M. Cernea*
Senior Adviser, Sociology
and Social Policy,
The World Bank

Acknowledgments

The authors are indebted to many individuals and institutions for assistance in undertaking the Land Settlement Review. Many were involved in carrying out, expediting, and assisting the research that is summarized in the country reports for Burkina Faso, Ghana, Mali, and Togo, and in the Seven Country Review.

In writing the Final Report the authors are especially grateful for comments on an earlier version by members and support staff of the Committee of Sponsoring Agencies (CSA) that met with the authors at the World Bank on 6 April 1990. Oral comments at that time were received from A. Papasolomontos (FAO); E. Samba, C. H. Vignes, O. W. Christensen, and J-B. Zongo (OCP/WHO); J. Lissner (UNDP); and F. Agueh, B. Benton, B. Liese, T. Sallah, and S. Guggenheim (World Bank). The authors are also grateful for earlier written comments from FAO's C. G. Groom, OCP's D. T. Baldry, and the World Bank's M. Cernea, C. Cook, D. Drayton, and J. Murphy, and subsequent comments from B. Benton, T. Sallah, and E. Skinner. Throughout the preparation of the Final Report the assistance and counsel of the World Bank's F. Agueh, Chief, Population and Human Resources Division of the Sahelian Department and of the Division's Onchocerciasis Unit has been invaluable, with special thanks to N. Glineur and John Elder who, as project officers, gave constant help, and to B. Benton, T. Sallah, and E. Skinner. Additional advice was periodically provided within the Bank by M. Cernea, C. Cook, S. Guggenheim, R. Key, J. Murphy, A. Seznec, and D. Steeds.

Within the IDA team, senior experts J. R. Dickey and J. H. Sanders were always responsive to queries, as were fellow authors K. Akwabi-Ameyaw, J. Buursink, D. Koenig, K. Savadogo, and J-B. Nana. Comments were also gratefully received from IDA personnel including D. Brokensha (who served as IDA director of the LSR until illness intervened in November 1989), C. Grimm, M. M Horowitz, P. Little, M. Sella, and M. Salem-Murdock, while Annex 3 was written by M. Painter. For graphics we are grateful to J. Buursink, J. Harlow, and M. Brandt. E. Albert and J. Cornell, Anthropology, University of Kentucky, provided valuable assistance with translation, typing, and preparation of various maps and graphics connected with the report.

We are grateful to Françoise Gebhart for translating the Executive Summary and Final Report into French. We are indebted to V. Carlip, IDA, who has handled all of the final editing. Invaluable editorial, research, and production assistance was received from S. Horowitz, C. Woodsong, C. Grimm, K. Munson, V. Beers-Tyler, D. Anson, and L. Loihle of IDA.

We would like to give a special note of thanks to E. Samba, Director of OCP, who has offered his unwavering support throughout this entire project. J-B. Zongo, Head of the Socioeconomic Development Unit of the OCP has been indispensable, both as a source of information and in regulating the myriad administrative and logistical problems we encountered. M. Pare, P. Chopin, C. Pharand, M. Ayina, D. Carvalho, and A. Soumbay, at the OCP national headquarters in Ouagadougou did

everything in their power to assist us in our work. We are also deeply indebted to the national OCP offices in Togo, Ghana, and Mali. We would like in addition to acknowledge our debt to Hunting

Technical Services Limited, who coordinated an earlier study in the OCP area.

As with other reports in this series, they represent the opinions of the authors only.

Acronyms

ARD	Associates in Rural Development
AVV	L'Autorité des Aménagements des Vallées des Volta
BIAO	Banque Internationale pour l'Afrique Occidentale (Mali)
BNDA	Banque Nationale de Développement Agricole
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CEARD	Cabinet d'Etudes d'Appui et de Recherches pour le Développement
CMDT	Compagnie Malienne pour le Développement des Textiles
CRPA	Centre Régional de Promotion Agro-Pastorale
CSA	Committee of Sponsoring Agencies
DAI	Development Alternatives Incorporated
E&F	Eaux et Forêts (Direction Nationale des Eaux et Forêts, of the Ministère des Ressources Naturelles et d'Elevage)
FAO	Food and Agriculture Organization
FELDA	Federal Land Development Authority
FSD	Farming Systems Development
GDP	Gross Domestic Product
GTV	Gestion de Territoire Villageois (Mali)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDA	Institute for Development Anthropology
IFDC	International Fertilizer Development Center
IITA	International Institute of Tropical Agriculture
LSR	Land Settlement Review
NGO	Nongovernmental Organization
NOS	National Onchocerciasis Secretariat
NOZDS	National Onchocerciasis Zone Development Studies
NPK	Nitrogen-phosphorus-potassium (fertilizer)
OCP	Onchocerciasis Control Programme
OHV	Opération Haute Vallée (Mali)
OMVS	Organisation pour la Mise en Valeur du Fleuve Sénégal
ONAT	Office National d'Etude et d'Aménagement des Territoirs
PATECORE	Projet Aménagement des Terroirs et Conservation des Ressources dans le Plateau Central

PNGTV	
or PNGT	Programme National de Gestion des Terroirs Villageois (Burkina Faso)
PRM	Projet Réinstallation Manantali
SOTED	Société Togolaise d'Etudes de Développement
SOTOCO	Société Togolaise du Coton
UNDP	United Nations Development Programme
UP	Unité de Planification or Planning Unit (AVV, Burkina Faso)
USAID	United States Agency for International Development
WHO	World Health Organization

Note: The exchange rate in July 1989 was approximately \$1 US = 315 CFA francs.

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Abstract

The Onchocerciasis (Riverblindness) Control Programme (OCP) was started in 1974 to control riverblindness in a seven country area in West Africa (Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Niger, and Togo). The Program was later expanded to include four more countries, Guinea, Guinea-Bissau, Senegal and Sierra Leone. In addition to the humanitarian goal of preventing blindness and debilitation from the disease, the Program seeks to promote socio-economic development by removing a major constraint. Many of the river valleys in the OCP area were underpopulated partly due to fear of contracting riverblindness. Control of the disease has brought increasingly rapid migration to the river valleys, a phenomenon to which national governments have responded with a wide array of settlement policies ranging from highly controlled sponsored settlements to completely uncontrolled spontaneous settlement.

An analysis of settlement patterns in West Africa and other areas shows that settlers follow a predictable pattern of migration and a predictable pattern of adjustment once they are settled. Planners need to be aware of these patterns to facilitate effective planning and prevent conflict. Given the budgetary constraints of most governments in the OCP area, assisted spontaneous settlement is recommended as a less expensive alternative to sponsored settlements and a more effective alternative to completely spontaneous

settlement. With assisted settlement, settlers make many of the major decisions with much less government intervention, but at the same time government agencies provide essential services and infrastructure.

Critical to the long-term success of any new settlement is security of tenure. While many of the areas are sparsely settled, few are unclaimed. Even when government has formal title to the land, successful settlement depends on the acceptance of new settlers by the host population, so formal permission to settle must always be acquired through traditional channels as well as government agencies.

In order to minimize risks, new settlers follow a pattern of diversified production within the household, once basic subsistence has been established. Households seek income from a variety of sources including cropping, livestock, trading, artisanal activities and wage labor. Non-crop income is particularly important for women and male relatives of the household head who may have less access to crop income. The desire for diversification runs counter to many government settlement programs that focus on one activity, usually cropping, and often on one crop such as cotton.

The creation of and/or support to markets is essential for the settlement process. Markets are the loci for commercial exchanges and for the provision of social services to inhabitants of

settlement areas. Functioning markets provide an outlet for surplus production, encourage investment in increased production and provide employment. They also encourage integration of settler and host populations which is an identifying characteristic of most successful settlement.

Integration of settler, host and pastoral populations is necessary for natural resource management and the long-term success of the settlement. Only if these groups can agree on land-use zoning—allocating areas to cropping, livestock and forestry—can forests be protected and a symbiotic relationship between agriculturalists and pastoralists be maintained. As settlers appropriate

more and more land, pastoralists find it increasingly difficult to find grazing land and conflicts between agriculturalists and pastoralists increase. The Land Management Program in Burkina Faso provides an example of the institutional arrangements needed to implement local land-use zoning.

Land settlement is a complex process, requiring planning and management at multiple levels over an extended period of time. Successful settlement planning requires a 15-20 year time horizon and sustained support from government agencies and donors. Local institutions, national governments and donors must all be involved.

1

Introduction

The Onchocerciasis Control Programme and Socioeconomic Assessments

The Land Settlement Review (LSR) is the second regional assessment coordinated by the Onchocerciasis Control Programme's (OCP) Committee of Sponsoring Agencies whose members are the World Health Organization (WHO), the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO), and the World Bank.

Preparatory Phase Study (1988)

The first assessment, the Preparatory Phase Study, was conducted by Hunting Technical Services Ltd. (U.K.) in collaboration with *Organisation et Environnement* (France). It was financed by the World Bank and executed by WHO/OCP. The study provides an inventory of existing physical and socioeconomic data for the areas in the eleven countries currently covered by OCP. The final report also includes development proposals for onchocerciasis control zones in each of the seven initial OCP countries, and makes recommendations for further in-depth studies as part of the development planning process in all eleven OCP countries (Hunting Technical Services 1988a,b,c,d).

Land Settlement Review (1990)

The contract for the second assessment, the LSR, was awarded to the Institute for Development

Anthropology (IDA). Field work began in December 1988 and terminated in October 1989. In-depth case studies of land settlement were conducted at sixteen sites in Burkina Faso, Ghana, Mali, and Togo. A less intensive review of settlement, based on interviews and analysis of existing documentation, was conducted in Côte d'Ivoire and Guinea. A third level of the LSR, which entailed critical analysis of existing documentation, was conducted for the remaining OCP countries: Benin, Guinea-Bissau, Niger, Senegal, and Sierra Leone. The IDA study was financed by the UNDP and executed by the World Bank.

The major objectives of the LSR are to:

- describe and evaluate settlement experiences to date, including organized and spontaneous types of settlement in the OCP areas and, where relevant, selected experience elsewhere;
- draw conclusions from these experiences concerning the major factors that promote (or detract from) rational settlement-related development, and derive lessons regarding the most effective interventions to influence such factors; and
- provide recommendations and guidelines (based on the two above) on: (1) how to manage the effects of spontaneous settlements; (2) what types of land use planning or other activities are needed prior to and in conjunction with spontaneous settlement; and (3) how to plan and implement initiatives in the future to support viable, low-cost, and sustainable settlement and/or settlement-related development in the OCP areas.

This report presents the conclusions and recommendations from the IDA Land Settlement Review. The report is concerned with factors that promote or hinder sustainable socioeconomic development in relation to settlement of OCP areas in the countries studied, and incorporates relevant observations from experiences with new land settlement elsewhere in Africa, and in Latin America and Asia. The results of the country case studies are presented in a series of separate country and site reports listed in Annex 1. The methodology of the LSR is described in the third section of this chapter and in Annex 2.

Background to the Land Settlement Review

The OCP is one of the largest and most effective regional health programs in the world. Since its inception in 1974, it has concentrated on controlling propagation of the blackfly, *Simulium damnosum*, which reproduces in the rapidly flowing waters of rivers throughout West Africa and serves as the vector for the parasite, *Onchocerca volvulus*, the cause of onchocerciasis. The Program's original area of operations covered 764,000 km² in seven countries—Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, and Togo. In 1986 the OCP area was expanded to cover 1.3 million km², including additional parts of Benin, Ghana, Mali, and Togo, and parts of Guinea, Guinea-Bissau, Senegal, and Sierra Leone (Figure 1.1).

The OCP has been fueled by a humanitarian concern for alleviating suffering among many thousands of West Africans who are affected by onchocerciasis. Just as importantly, the program has expected its efforts to contribute to socioeconomic development in the OCP areas. In this report, "OCP areas" refers to those river basins throughout the eleven countries in which settlement has accelerated since the commencement of vector control and/or which have potential for future settlement. Although this definition includes such extensive hinterlands as Togo's Mo Plain and Ghana's "Overseas" Area (Figure 1.1), it is narrower than the original and extension vector control areas shown on OCP maps.

Since the beginning of OCP operations in 1974, transmission of onchocerciasis has been virtually halted; the parasite is rapidly dying out in the human population, and the disease is no longer considered to be a major public health threat in the countries initially covered by the program. To-

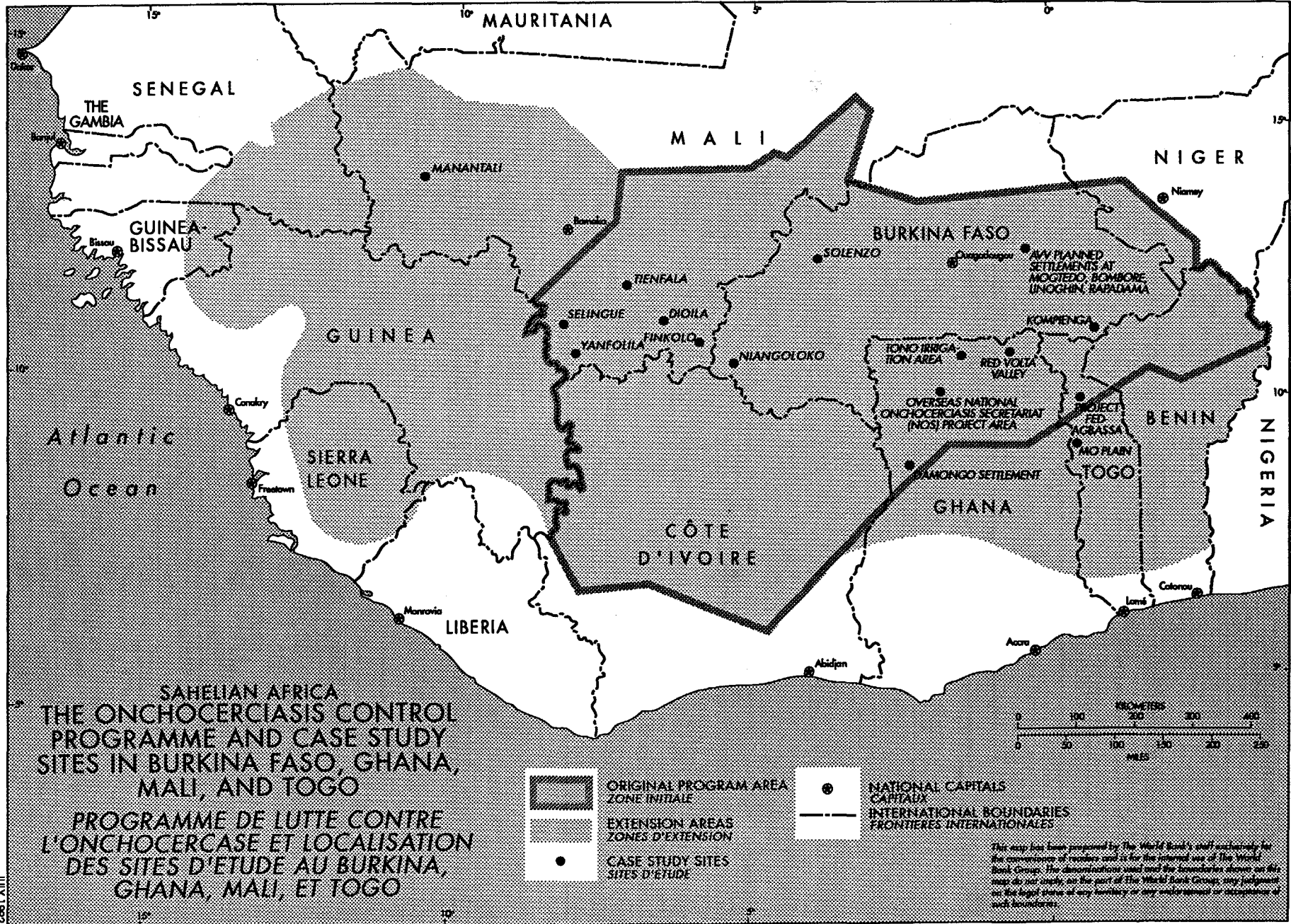
day many of the control areas are being reoccupied by adjacent populations as well as by immigrants from outside the immediate basin region.

However, there is increasing concern about the long-term sustainability of the production systems created by this settlement process. Most settlement taking place follows the worldwide trend of being spontaneous and agricultural, with little or no government guidance or assistance. Unsupported, spontaneous settlement of new lands in Africa, and other areas of the tropics, often is associated with rapid population growth and increasing population density in settlement areas. This frequently results in the development of local systems for managing natural resources and agricultural production that have negative long-term consequences, ranging from declining productivity and real income levels, to outright environmental destruction, and the eventual abandonment of once-productive lands.

Assistance is required to ensure that new land settlement results in production systems that are sustainable, that result in satisfactory livelihoods for host and settler families alike, and that produce viable socioeconomic development within their communities and surrounding regions. Now that onchocerciasis has been controlled and the pace of settlement in many of the once-infected zones is increasing, governments, donors, nongovernmental organizations (NGOs), and local populations face the daunting challenge of providing effective assistance for settling these relatively high-potential areas in West Africa. A major question, then, is what form this assistance should assume.

Previous attempts to promote settlement-related development in the OCP areas through such government-sponsored planned settlements as the *Autorité des Aménagements des Vallées des Volta* (AVV) in Burkina Faso, or the *Projet FED-Agbassa* in Togo, have been expensive; similar attempts are not likely to be practical given the limited resources of most West African countries. In view of the drawbacks of prior models of capital-intensive, government-sponsored settlement, there is a critical need for new approaches that will facilitate the development of sustainable farming systems in areas undergoing spontaneous settlement.

The approach advocated by IDA is assisted (occasionally referred to as "directed" or "facilitated") spontaneous settlement. As a planning concept,



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FIGURE 1.1 IIRD 29835

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this is intermediate to government-sponsored, often capital-intensive, settlement at one extreme, and spontaneous settlement at the other. Assisted spontaneous settlement offers a flexible approach. At the local level, it provides settlers with some essential support in the form of infrastructure (roads, bridges, wells, etc.) and social and economic services (crop and livestock extension, health facilities, credit, schools, nonformal education, etc.). This support can be used to guide settlers into carefully selected predetermined areas or to work with spontaneous settlers who are already living at a site to encourage them to invest in the development of more intensive, sustainable land use practices. Assisted settlement can also include some degree of sponsored settlement. Experience with settlement elsewhere has demonstrated that carefully planned, strategically placed sponsored settlements can provide regional service centers and development "beachheads" that also incorporate host populations and spontaneous settlers—a major benefit that planners have seldom anticipated. Because of closer supervision, such settlements also can serve as demonstration centers for new participatory approaches to the management of land and water resources.

Specific interventions will depend on the broader ecological, economic, sociopolitical, and institutional context for development in a given area. Also important is whether an intervention is begun early or late in the settlement process. Four types of situations have been identified:

- areas where a significant amount of settlement has already occurred;
- areas where spontaneous settlement, with or without some sponsored settlement, is currently under way;
- areas where settlement can be expected to occur in the near future (as in the OCP extension areas or in hitherto unsettled riverine lands in the original area of operations);
- areas where spontaneous settlement is unlikely to occur because of constraints other than onchocerciasis (such as isolation or trypanosomiasis).

On the basis of its analysis, IDA has identified prerequisites for establishing environmentally, economically, and socially viable communities in OCP areas. The prerequisites seem to be significant enough to list universally. These prerequisites include: secure access to land and other natural resources, integration with the host population; diversified production systems; favorable

national policies; and carefully prioritized and phased government assistance. The implications of these prerequisites for the development of the OCP zones will be considered in the chapters that follow.

Approach and Methodology of the Land Settlement Review

The LSR aims to provide countries and donor agencies with guidelines and recommendations for how best to implement assisted settlement within the context of a country's overall strategy for national development. A basic premise of the review is that land settlement is most likely to produce sustainable development when it occurs in less isolated areas that are characterized by moderate economic growth, equitable distribution of the benefits of growth, and diversified production systems that do not threaten the environment. Another premise of the study is that successful planning for sustainable area development must: (a) be compatible with the multiple social and economic goals of the affected households; and (b) be realistic within the broader ecological, social, economic, and institutional context of a specific country.

With these premises in mind, the review has focused on qualitative and quantitative data with a view toward emphasizing those factors that we believe influence sustainable settlement-related development. The LSR has used a combination of country case studies and a less-intensive review of settlement in the OCP countries. The country case studies consisted of community and household-level field research at 16 sites (Figure 1.1) in Burkina Faso (McMillan, Nana, and Savadogo 1990), Ghana (Akwabi-Ameyaw 1990), Mali (Koenig 1990a), and Togo (Painter 1990) that were judged representative of the three major types of settlement that occur in the original OCP area—planned, assisted spontaneous, and unassisted spontaneous settlement.

The study sites comprised 114 villages and several cooperatives. Household-level studies were conducted in 485 settler households in 66 villages; leaders and other community members, including members of host populations, were interviewed in an additional 48 villages.

Table 1.1 provides an overview of the case study sites including their names and locations, the nature and size of the sample at each location, the nature of the settlement process represented,

Table 1.1 The Land Settlement Review Case Studies

<i>Country; name of site; nature of sample</i>	<i>Settlement type; approximate date of settlement onset</i>	<i>Location in country</i>
Burkina Faso		
1. Solenzo (3v:36hh+19v)	Spontaneous (1960s)	Kossi province
2. Niangoloko (22v)	Spontaneous (1982)	Comoe province
3. KOMPIENGA (1v:35hh)	Dam-related planned resettlement and spontaneous (1983)	Gourma province
4. Volta Valley Authority (AVV-UP1)		
a. Survey Restudy		
Linoghin (6v:20hh)	Planned (1973)	Oubritenga province
Mogtedo-Bombore (7v:20hh)	Planned (1979)	Ganzourgou province
Mogtedo (6v:40hh)	Planned (1974)	Ganzourgou province
b. Case Study Restudy		
Mogtedo V3 (1v:20hh)	Planned (1975)	Ganzourgou province
c. Rapadama		
	Assisted (1987)	Ganzourgou province
Ghana		
1. Red Volta Valley and Plateau (2v:30hh)	Cyclical, spont. (late 19th cent.)	Upper East Region
2. Fumbisi-Yagoba-Soo Mankarigu ("Overseas") (4v:30hh)	Assisted (1985)	Upper West, Upper East, and Northern Region
3. Damongo Settlements (3v:30hh)	Planned (1950s)	Northern Region
4. Tono Irrigation Scheme (2v:30hh)	Planned (1980s)	Upper East Region
Mali		
1. Yanfolila (5v:30hh)	Spontaneous (1970s); Assisted (1985)	Third Region (Sikasso)
2. Selingue (3v:29hh)	Dam-related planned and spontaneous (late 1970s)	Third Region (Sikasso)
3. Dioila (4v:30hh)	Spontaneous (1960s)	Second Region (Koulikoro)
4. Finkolo (3v:30hh)	Wage workers in workers' villages at tea plantation (late 1960s)	Third Region (Sikasso)
5. Tienfala (3v:9hh)	Spontaneous, by railway workers (from early 1900s; continuing)	Second Region (Koulikoro)
6. Manantali (14v:70hh)	Dam-related planned (1986/87)	First Region (Kayes)
Togo		
1. FED-Agbassa (3v:30hh)	Planned (1972)	Kara Region
2. Mo Plain (3v:30hh+6v)	Spontaneous (1970s)	Central Region

Note: Numbers in parentheses that follow site names denote the number of villages at each site where household interviews were conducted, followed by the number of households in the site sample. Numbers preceded by a plus sign denote the number of additional villages at the site where leaders and other community members were interviewed. Information on Manantali was drawn from earlier research dealing with that project (Horowitz, Koenig, Grimm and Konate forthcoming).

and the approximate date at which settlement began to accelerate in the area. Special attention was given to the Burkinabe experience for two reasons. First, government policy has placed more emphasis on land settlement as a development intervention. Second, the availability of more

time series data, and of more detailed analysis of that data, makes the Burkinabe experience especially relevant to the other OCP countries.

Questions asked of settler household members at each study site concerned household migration histories; patterns of production, consumption,

and investment; the nature and uses made of returns on production; off-farm activities; natural resource management; etc. Community leaders and other individuals were asked questions about village history, migration and settlement in the area, land use and land conflict, the presence of social services and infrastructure, markets, etc. Regional-level information on settlement and development was obtained through interviews with representatives of government and nongovernmental organizations and projects, and through a review of government documents.

The patterns of settlement at each site are more complex, and the variety of data sources used by IDA research teams at each site more varied, than this summary table (Table 1.1) indicates. Readers are encouraged to consult the country case-study and site reports listed in Annex 1 for further information on specific histories and patterns of settlement at each site, and for additional detail on the research methods used.

Organization of the Report

The present report draws from findings and analyses of the case study reports for Burkina Faso, Ghana, Mali, and Togo, from a less intensive review of the settlement patterns in Benin, Côte d'Ivoire, Guinea, Guinea-Bissau, Niger, Senegal, and Sierra Leone (Buursink with Painter 1990), and incorporates relevant comparative material from other sources.

Chapter 2 presents an overview of the OCP areas, describing their natural resource base and comparing it to that of other areas in the larger West African region. Immigration and settlement patterns in the OCP areas are described. The chapter notes features of the OCP areas that—along with the impact of onchocerciasis itself—have made them problem prone, thus posing formidable challenges to development planning. These constraints on settlement include isolation, a lack of reliable potable water supplies, existing systems of land tenure, and a variety of human and animal diseases. Another recurrent feature of OCP areas is their location near, or overlap with, international borders.

Chapter 3 concerns the nature of land settlement. It draws from a comparative analysis of the settlement process in over 100 cases worldwide to describe major types of settlement and assess different models of development planning for new lands settlement. The chapter describes five

stages of the settlement process that have been observed in all cases of successful settlement. Finally, the issues of settlement cost, cost reduction, and cost recovery are considered.

Chapter 4 examines the potential of new lands settlement as a national development strategy, and uses the case studies as a basis for assessing the potential for successful settlement-related development in the West African OCP areas. Three broad prerequisites for successful settlement—settler initiative, effective use of the natural resource base, and a favorable economic and social environment—are identified, and recommendations are made concerning the most promising approaches for supporting settlement in OCP areas. These approaches entail: (1) assisted, guided settlement in higher potential areas; and (2) linking sponsored settlement with processes of spontaneous settlement.

Chapter 5 argues that successful OCP area settlement requires that development planning be integrated into its regional and national contexts, and that government policies be favorable to settlement area development. Coherent development planning for OCP areas entails attention to development imbalances within the OCP countries and to the potential impact of OCP area development in attenuating or exacerbating these imbalances. It also entails linking investment in OCP settlement areas with investment in settlers' home areas (sending areas) and areas adjacent to the underpopulated river basins. In this regard, favorable government policy relates to rural-urban linkages, terms of trade, and agricultural production support as well as infrastructure development.

Chapter 6 summarizes major features of land tenure in the OCP areas and describes the problems that arise as host populations and populations of agricultural settlers and pastoralists attempt to obtain and maintain access to the land they need to ensure their livelihoods. The chapter emphasizes the importance of secure tenure in settlement areas and links secure tenure to the development of sustainable production systems. Strategies are recommended for strengthening security of tenure and for organizing land management in OCP areas.

Chapter 7 details the importance of a diversity of real income sources to the livelihoods of settlement-area households and categories of individuals like married women and dependents within household units. It is necessary for planners to provide help to settlement-area populations that

is not restricted to increasing agricultural production and productivity alone, but considers as well the possibilities for promoting a range of earning opportunities for all family members. This chapter also discusses the role of rural finance, including credit.

Chapter 8 examines the extensive, low-input agricultural systems that characterize most of the case study areas. Higher-input, technologically more advanced farming systems that have been established in a few areas of commercial cotton production are also described. Low-input systems often produce initially satisfactory yields that decline as soil fertility decreases. High rates of additional immigration to the commercial cotton areas and selective use of the proposed extension package have created a related set of problems. The relationship between the ability of households in OCP areas to diversify their sources of real income and their willingness and capacity to invest in more intensive and sustainable agricultural production is considered in the light of recurring difficulties with support for agricultural production in these countries, including weak extension services, problems with marketing surplus production in the more isolated regions, and technical packages insufficiently responsive to local, on-farm conditions. Prospects for large- and small-scale irrigation (including enhancement of such local systems as swamp and flood-recession agriculture) are also discussed.

Chapter 9 addresses the nature and importance of markets and service centers in the case-study areas. The chapter links market dynamics with the development of diversified opportunity structures, which IDA believes are essential for sustainable development in OCP areas. The chapter examines factors that affect the access of settlement-area populations to market opportunities, and recommends approaches to upgrading centers as a means of promoting development in OCP areas.

Chapter 10 deals with factors that promote or inhibit successful integration of host and settler populations and pastoralists in OCP areas. The importance of host sponsorship of settlers and pastoralists is discussed, as is the importance of increased livestock ownership in settlement

areas. Animal husbandry contributes importantly to diversification of real income sources and viability of settlement areas, but it also raises formidable challenges. Especially important is the need to delineate and manage special areas devoted to livestock grazing. Two types of zoning are recommended: village-level zoning for livestock grazing, and larger zones for pastoralists with bigger herds. The effective implementation of both land use models requires active involvement of all local inhabitants.

Chapter 11 examines alternative models for natural resource management that include a combination of: (1) zoning to legislate land use in certain areas; and (2) active-collaboration of the people living in the area in sustainable resource management. Several approaches are considered, with special emphasis on village land management models like the *Programme National de Gestion des Terroirs Villageois* (PNGTV or PNGT, as it is currently referred to) in Burkina Faso that is currently being advocated by several donors and national governments. Experimental programs to address pastoralist zones and settlement near classified forests are also described.

Chapter 12 is concerned with management structures for assisting OCP-area settlement. At the local level, emphasis is placed on community land management associations. Effectiveness of local-level management structures requires that they be responsive to local populations' perceptions concerning risks, opportunities, and constraints. This demands, in addition, strong support from OCP governments. Countries where extensive spontaneous settlement is occurring or is likely to occur over the next decade are likely to benefit from a specialized planning, coordination, and monitoring unit within the ministry responsible for long-term land use and economic planning. In general, however, the responsibility for actual implementation is best left to the relevant line ministries, regional development agencies, and local institutions. NGOs can play an important supporting role. Effective international support of different national efforts requires ongoing financial and institutional support as has been the case with vector control.

Note

1. See, for example, Bharin 1981; Dollfus 1981; Nicolai and Lasserre 1981; Raison 1979, 1981; Remy 1973, 1975, 1981.

2

Overview of the OCP Areas

Natural Resource Potential in the OCP Areas

The greater part of the OCP area is situated in the sudano-sahelian climatic zone of West Africa, covering 1,300,000 km² of the West African ecological region. The climate is characterized by a single rainy season and a dry season that can last between six and nine months. Rainfall in the sudano-sahelian zone varies from 300 mm in the north to 1,400 mm in the south. Highly variable from year to year, as well as locally within any one area, serious rainfall deficits occurred during the 1969-1974 and 1983-1984 periods. While rainfall throughout the OCP area has remained within the limits of the 500-to-1,000 mm isohyets (OCP 1986:3-4; Figure 2.1), recent droughts "were part of a long spell of below-average rainfall beginning about 1968" (Jayne, Day, and Dregne 1989:4 and Figure 2.2). Such variability has had an important impact on migration and interethnic conflict, with farmers moving north into pastoral zones during the higher rainfall years of the 1950s and early 1960s, and transhumant pastoralists moving south with the commencement of lower rainfall in 1968. In recent years such conflicts have been exacerbated by border closures. Unless preventive measures are taken, conflicts can be expected to intensify as settlement increases in the oncho-free river basins of the eleven countries.

Soil quality varies in the OCP area but, generally speaking, soil fertility is low. Recurring problems that affect soils in the area include deficiencies in organic material, nitrogen, and phosphorous, and susceptibility to crusting,

compaction, and subsoil panning. These latter features all have serious implications for the spread of animal traction. Nonetheless, the OCP area has been described as having a productive potential greater than that of other areas in the West African region (OCP 1986). Soils classified by the FAO as having agricultural value between "average" and "very good" accounted for 33 percent of soils within the OCP area (the initial area and the southern extension) compared to 16 percent outside. Average to poor soils represent 55 percent of the OCP area and 70 percent of the West African region as a whole. The higher productivity of soils in OCP areas is a major reason why development strategies should emphasize both the underpopulated OCP river basins and the frequently overpopulated sending areas, even though development costs can be expected to be higher in the former.

Farmers have responded to variable, occasionally harsh environmental conditions with such risk-reduction strategies as crop diversification (multicropping) and intercropping. Crop diversification applies not just to different species of cultigens but also to different varieties. The Gourma of Burkina Faso, for example, over the millennia, have evolved many varieties of millet. During the past 50 years plant breeders have not been able to produce new varieties of such staples as millet, sorghum, and cow peas that perform better than local varieties on farmers' fields under rainfall that varies from year to year (Carr 1989). This realization is just one instance of an increasing awareness that the starting point for

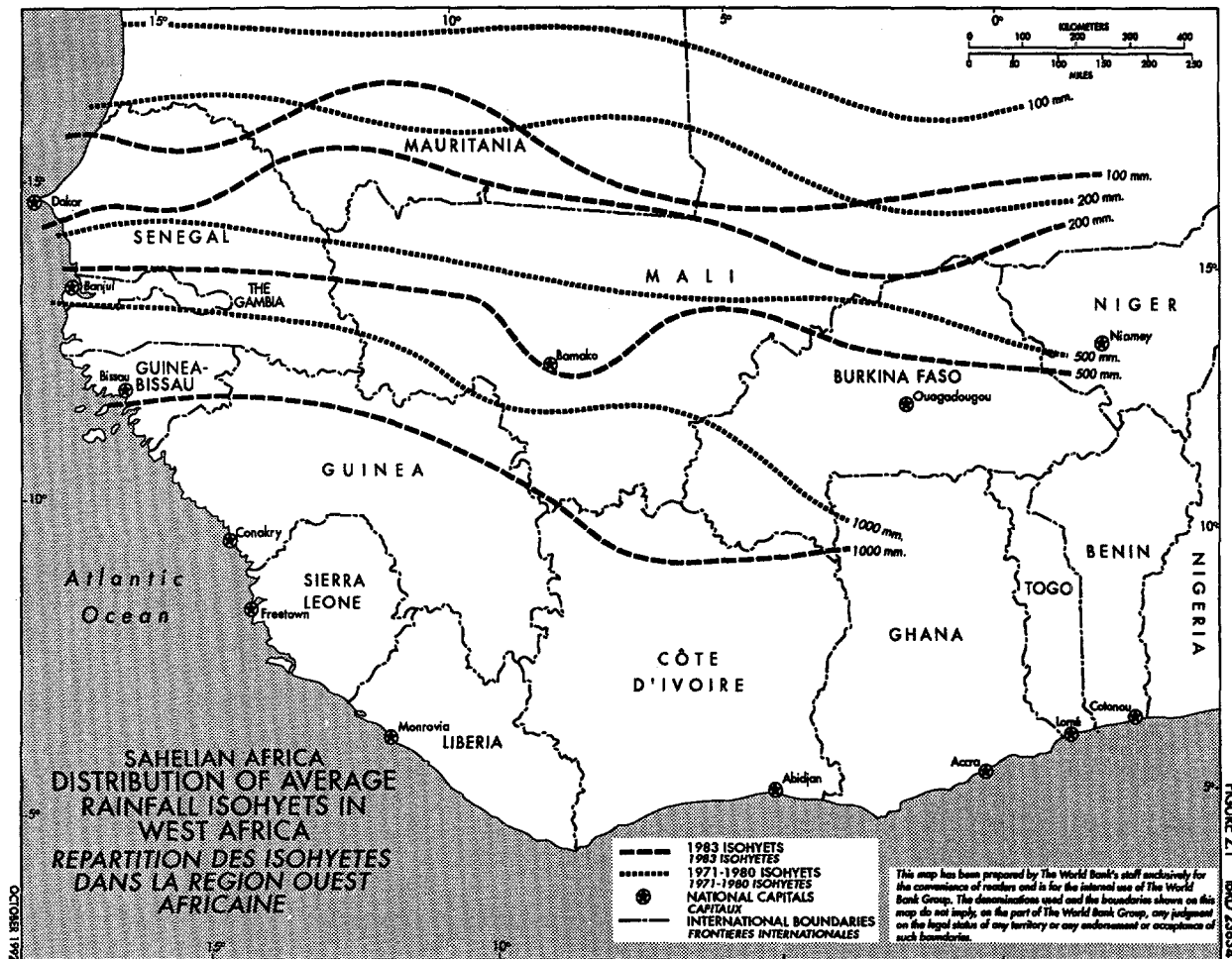


FIGURE 21 RBD 23824

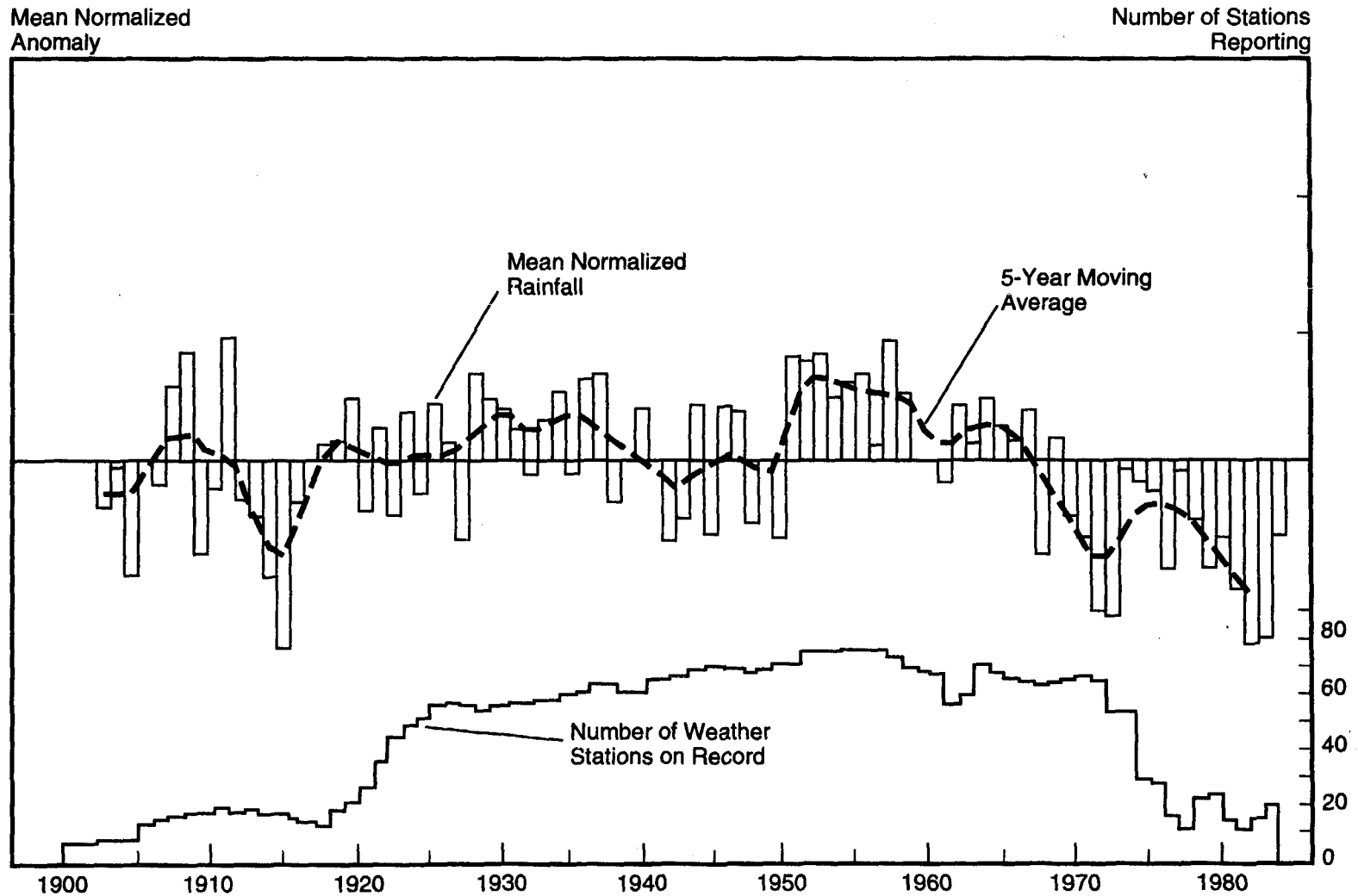
improving agricultural productivity in the OCP countries must be existing farming systems, with new technologies adapted to those existing systems and tested on farmers' fields.

The vegetation and water regimes in much of the OCP area are conducive to animal husbandry, but heavy *Glossina mortisans* infestations, particularly in the south, have hindered the development of cattle that are trypanosomiasis tolerant. The river basins of the OCP area have traditionally served the transhumance of West Africa's pastoralists (Hunting Technical Services 1988a,b,c; Sowers 1986; OCP 1986). The OCP can help to increase small farmer incomes, productivity, and living standards since vector control has opened up the higher potential river basins for increased settlement. While the World Bank estimates that the Sahel has already exceeded its carrying capacity

under existing farming systems, average population density for the OCP area in 1986 was low: 20.2 persons/km², well below the potential carrying capacity for about half the area (OCP 1986). Not only is sub-surface water more available, but the river basins contain a higher proportion of more productive (though harder to work) clay soils.

The OCP areas have also been a vital source of fuelwood and construction materials for the region's growing cities. As for other resources, only a fraction of the basins' potential for fishing and hydroelectric power has been tapped. Several major dams have been completed since control started; others are being planned. Moreover, the recent discovery of gold in several areas of Burkina Faso, Guinea, and Senegal has created interest in the area's potential for generating mineral wealth. The OCP river basins also comprise one of West

Figure 2.2
Mean Normalized Rainfall in Selected Weather Stations in the West African Sahel



Note: The ratio of annual minus long-term average rainfall to the long-term standard deviation in rainfall. Values for the mean normalized anomalies are seasonal May to October totals.
 Source: Jayne, Day, and Dregne 1989:5.

Africa's greatest environmental resources. In the 1950s, the area's sparse population densities made it possible to designate vast areas as classified forests and wildlife reserves. Today, the highest concentration of the region's protected wood and wildlife areas is in the OCP zone, which also includes practically all the major national parks of West Africa (Figure 2.3). These large natural areas are of considerable significance in determining the flow and conditions of the area's major watersheds. This direct tie-in to the watershed is especially evident in the northern Guinea area covered by the western extension.

Settlement and Immigration Patterns

Beginning shortly after the turn of the century, the combined impact of state policies and a harsh environment has engendered large migrations of peasant smallholders from the landlocked Sahelian OCP countries (Burkina Faso, Niger, and Mali) and the drier sudanian regions of the coastal countries (Benin, Côte d'Ivoire, Ghana, and Togo) to the more developed plantation economies of the coast. The 1969-1974 drought intensified these migrations and also contributed to migrations from the drier areas of the Sahelian countries into the less-populated agricultural areas (which became the OCP areas) to the south as well as to the developing urban centers.

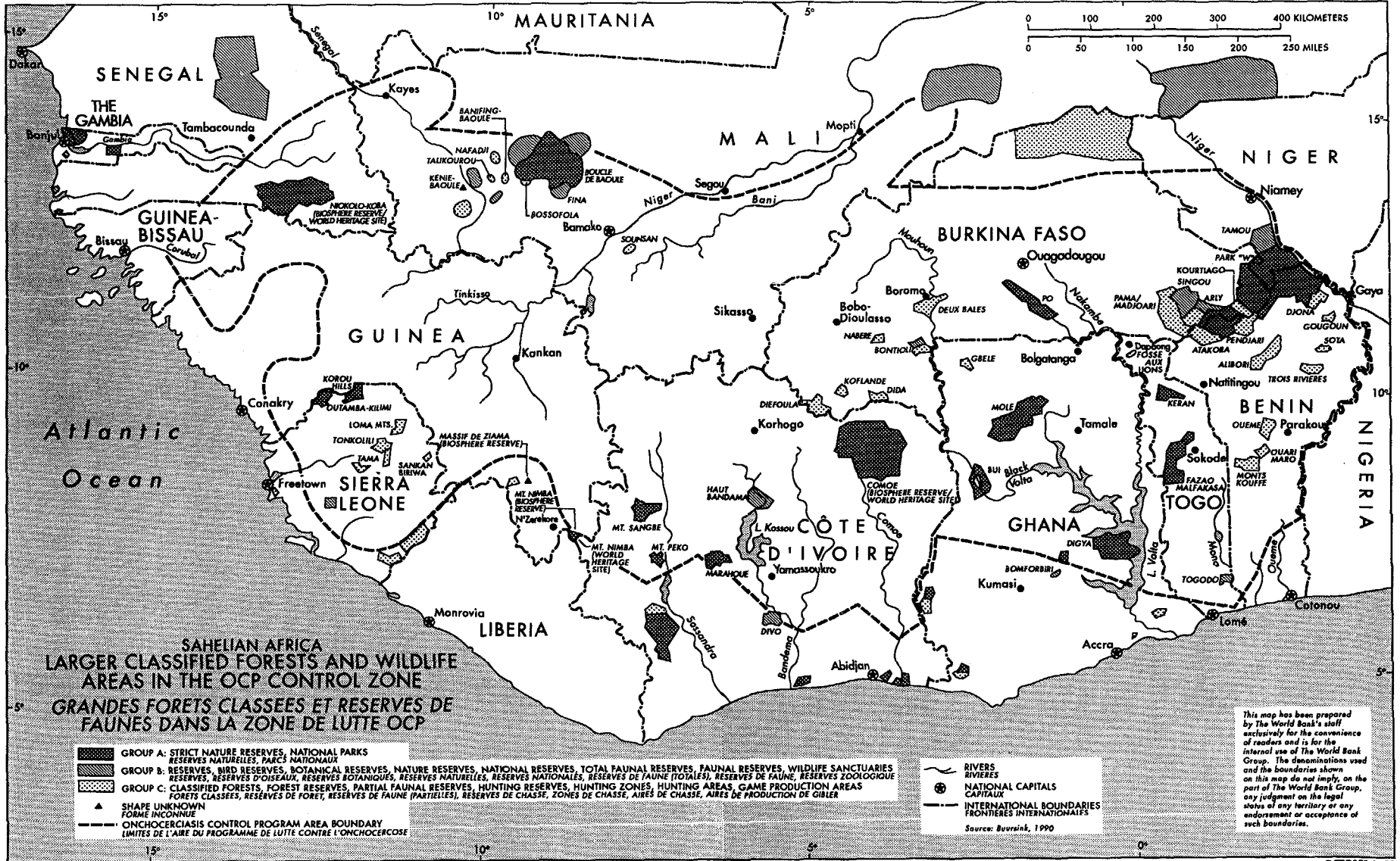
Despite low population densities, relatively high quality soils, and substantial population pressure in other areas of these countries, very little of the earlier rural-to-rural migration was directed toward the river valleys. The principal exception to this is Mali. In contrast to the other OCP countries, Mali's highest population densities are found in the Niger river basin included in the original core OCP zone. These high population densities presumably can be traced not only to the Niger River's location in the heartland of Mali but also to the fact that it is the largest river flowing through the OCP areas (generally speaking, rivers elsewhere in the OCP zone are tributaries that are not navigable year round). Another exception is the Mouhoun (ex-Black Volta) River basin in Burkina Faso. Immigration to this region was well under way before 1974. The impetus was a successful program to promote cotton production. In general, however, early settlement in the Mouhoun Basin was directed to areas immediately adjacent to the river.

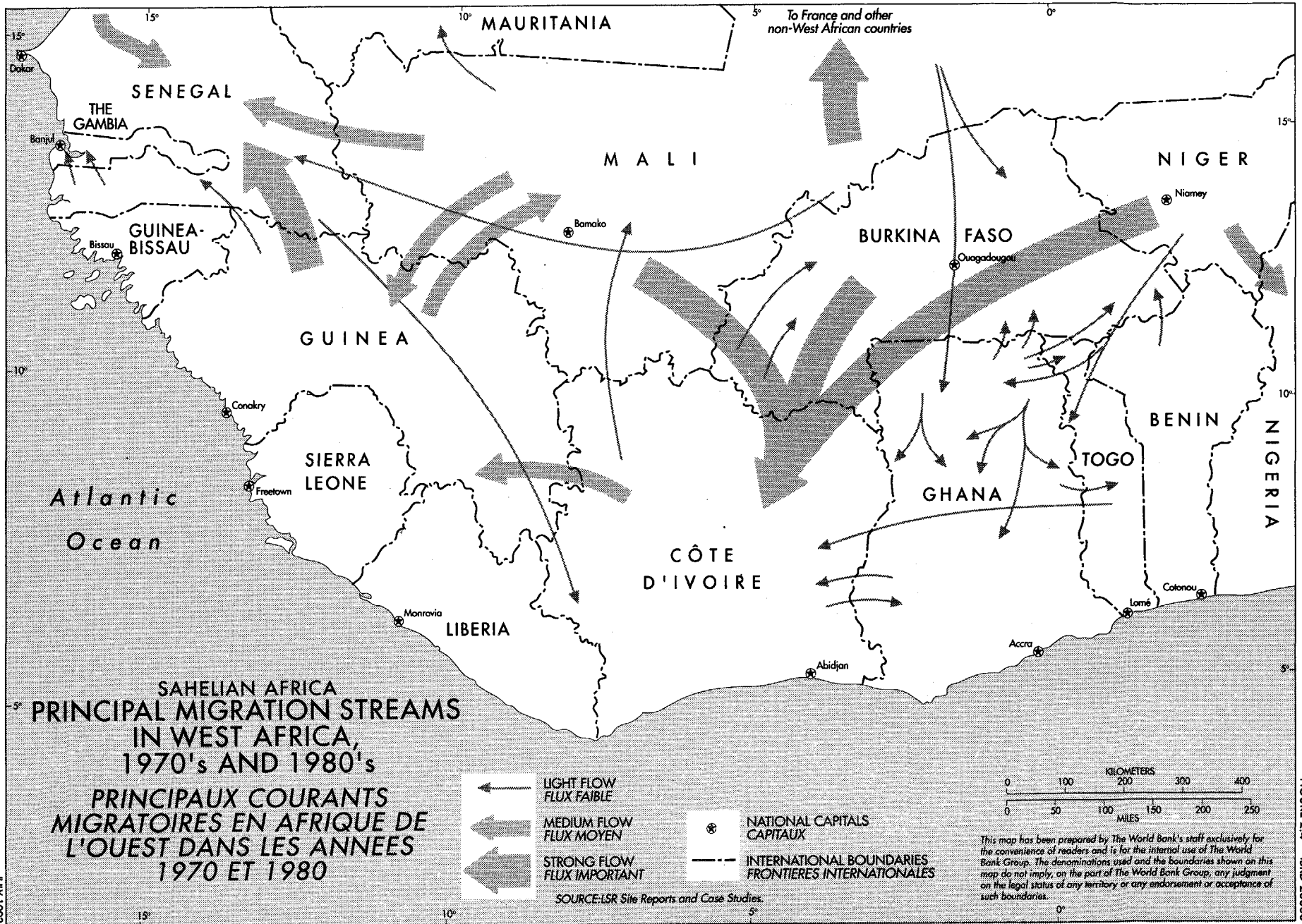
In the mid-1970s, members of the OCP's Ecological Panel argued for closer cooperation between the vector control and development components of the program because they believed that rates of spontaneous settlement in the OCP areas would accelerate significantly in response to spraying. This belief was based on the history of spontaneous migration and settlement elsewhere in the tropics. While rates of migration in the OCP areas did increase, not only was the increase less than expected, but it was restricted to less-isolated, higher-rainfall areas such as the cotton boom area in the Mouhoun (ex-Black Volta) Valley in Burkina Faso as opposed to, for example, the country's more southern border basins like the Kompienga, Leraba, and Comoe, which have higher rainfall but are more isolated (Hervouet et al. 1984).

We suspect that the lower rates of spontaneous settlement in OCP areas during the 1970s can be explained by the presence of alternative opportunities for would-be settler populations from the northern, sahelian areas, who could pursue their livelihoods further to the south in the rural areas and in the growing urban and peri-urban areas along the Guinea Coast (Figure 2.4). Many thousands of migrants from Burkina Faso, Mali, and Niger, and also substantial numbers from northern sections of Benin, Côte d'Ivoire, Ghana, and Togo, worked as wage laborers or sharecroppers in the production of crops for export (coffee, cocoa) or domestic consumption (maize) in the southern areas of the Guinea Coast countries. Others settled and farmed these crops on their own account. Large numbers engaged in petty trade and in the service sectors of these economies, which were driven in large part by the production of agricultural commodities and minerals for export.

Since the early 1980s, the coastal countries have been affected by economic downturn and slowed development. These changes, and related developments that include ethnic conflicts, repeated expulsions of foreign workers, and occasional border closings all along the Guinea Coast, have reduced the net flow of outmigration. In addition, migrants are returning to the sahelian states and to the northern areas of such countries as Benin, Ghana, and Togo. Although statistics on the numbers involved are not available, some are settling in the OCP areas of, for example, Burkina Faso, where they are joined by pastoralists recently expelled from Côte d'Ivoire and Ghana. Elsewhere,

FIGURE 2.3 IBRD 23839





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migrants and nationals who have been residing in neighboring coastal countries for much longer periods are returning and settling in OCP areas of Mali and Togo. If economic growth continues to be slow in the Guinea Coast countries, and if their immigration policies are unfavorable, we can expect spontaneous migration into the OCP river valleys to increase significantly during the rest of this century. Even if job opportunities improve outside the OCP areas, population increase alone will contribute to a higher rate of immigration into the river valleys than occurred during the 1970s.

Constraints to Settlement and Development in OCP Areas

The historically low levels of migration to the river basins is not generally considered to be the result of low fertility, or of onchocerciasis (Hunting Technical Services 1988a,b,c; Berg et al. 1978:14). Researchers suggest many causes, often cumulative. Research on valley settlement patterns in Burkina Faso, Mali, and Togo indicates that many isolated valleys were affected in the course of nineteenth century slave-raiding and warfare (Hervouet 1977, 1978; Koenig 1990a; Painter 1990), and in the early part of the twentieth century, these same valleys were ravaged by trypanosomiasis epidemics, and perhaps yellow fever (Hervouet et al. 1984). These same studies suggest that onchocerciasis simply added to the effects of these epidemics and wars by destroying the scattered, low-density settlements that were left in their wake (Hervouet 1978; Hervouet et al. 1984).

A variety of factors has contributed to the relative sparseness of settlement in the OCP river basins. These areas are frequently isolated; they lack reliable supplies of potable water; and they are affected by diseases other than onchocerciasis that are a threat to human and animal life alike. The close proximity of many OCP areas to international borders may also have an important impact on settlement patterns and development options, as do systems of land tenure among the host populations. Lack of attention to these important constraints on settlement, which are elaborated below, can reduce the effectiveness of development planning in the OCP areas.

Isolation

With the exception of parts of Mali and a few large Bissa and Dagara communities in Burkina

Faso (Hervouet et al. 1984), the OCP river basins tend to be isolated. This isolation takes several forms. Some OCP areas had no markets prior to 1974, and thus were poorly integrated with larger economic regions. Because of the historical sparseness of populations in basin areas, these areas are often incorporated within larger administrative districts. As a result, people are often isolated from administrative services and assistance, ranging from physical infrastructure to health care, education, and extension.

Some of the once-infected regions are isolated by the rivers and tributaries themselves. With the exception of the Niger River and portions of some of the major tributaries of the Senegal, few rivers in the control zone can be used for transportation except for short distances and/or for short periods during the rainy season. During the rainy season, when waters rise, rivers may isolate entire areas from the surrounding region (e.g., the "Overseas" in Ghana; the Mo Plain of Togo prior to 1983).

Lack of Potable Water Supplies

A shortage of reliable supplies of potable water was observed throughout the OCP areas. Women at most of the case-study sites complained about the difficulty of access to water. This was true even in Dioila, Mali, where settlement began in 1986 and was otherwise considered a qualified success. At all of the study sites temporary migrants—pastoralists and agriculturalists alike—cited lack of water in the dry season as a major reason for not relocating permanently. A shift from seasonal to permanent settlement is important in settlers' developing more sustainable patterns of land use, cropping, and livestock production.

Water was a major problem in the AVV-sponsored settlements in the Upper Nakambe (ex-White Volta) Valley, where geological formations at the sites made it sometimes necessary to drill 40-50 meters for drinking water. Many of the wells that were drilled when the first planned settlements were created in 1974-1977 are drying up; the original pumps are wearing out and need to be replaced. At the same time, demand for water has increased because large numbers of spontaneous agriculturalists and pastoralists have settled around the edges of the sponsored settlements and because the settlers have larger livestock herds. The settlers have managed to pool money for repairs, but attempts to get non-sponsored settlers to contribute to the upkeep of

the wells have met with only limited success. Water points are also scarce in the Mo Plain of Togo, and as many as half of the boreholes drilled in the area since the early 1980s are inoperative. As a consequence, women in some settlements walk up to five kilometers to obtain water from wells, occasional springs, or ponds. Use of infected pond water has resulted in a very high incidence of Guinea worm in some Mo Plain villages. Similar problems were encountered in the "Overseas" area of Ghana.

Other Human and Animal Diseases

A wide variety of human and animal diseases is associated with OCP river basins, including malaria, Guinea worm, schistosomiasis (especially in the southern extension areas), and bovine and human trypanosomiasis. Malaria exists throughout the OCP areas, while the incidence of schistosomiasis has increased because of the formation of reservoirs behind dams and increases in the area irrigated.

The areas affected by onchocerciasis strongly overlap with the distribution of the tsetse fly carriers of bovine trypanosomiasis—whose extent is even greater because of movement of infected stock and the mechanical transmission of the disease by other biting flies. Human trypanosomiasis (sleeping sickness) in West Africa is carried by two riverine species of tsetse. Sleeping sickness, which WHO fears is undergoing a resurgence in certain West African locations, "has caused depopulation through death, desertion, and migration from river valley communities with the abandonment of farms and settlements through fear of the disease" (Molyneux 1985:254-55). Though distribution of the disease is more focused than onchocerciasis, Molyneux goes on to say that sleeping sickness in river basins "could be regarded as the major factor in the depopulation this century" (ibid:259). Guinea worm is a problem at case study sites in Ghana's "Overseas" and Togo's Mo Plain. Other outbreaks of disease are hard to predict. For example, a mysterious water virus that could not be identified was discovered to have contaminated the water supply in one of the early AVV planned settlements in Burkina Faso in 1978—a fact that subsequently led to abandoning the original village site, but not before the entire village (extension staff included) had hands and arms covered with painful skin growths.

Indigenous Systems of Tenure

Although many OCP river basins are sparsely settled, all land, water, and other natural resources are still subject to local tenure systems. As discussed in Chapter 6, settlers and transhumant pastoralists must take these systems into account if they are to avoid future conflict. From their perspective, however, the constraining aspect of such systems is that they provide use rights rather than rights of ownership, with the result that settlers hesitate to make permanent improvements through, for example, planting trees or constructing water retention devices. Settlers also find it difficult to establish their own villages and political leaders. The solution to this constraint is to integrate hosts, settlers, and pastoralists into government-recognized and legally incorporated land-use communities, as discussed in Chapter 11, at the earliest possible time.

Proximity to International Borders

Rivers were historically the major geographical features used to designate the frontiers between colonial possessions and administrative units. These frontiers have generally been maintained. Thus, a high percentage of the OCP river basins are in border areas. Some, like Kompienga in Burkina Faso, front with more than one country (in this case Togo and Benin). On the positive side, this proximity to the border presents settlers with opportunities to profit from trade.

International borders are often the sites of dynamic markets such as the early Mo Plain market sites along the Togo-Ghana border. When settlements coincide with road crossings, the towns have frequently emerged as administrative centers too—for example, Niangoloko on the Burkina-Côte d'Ivoire border. The presence of customs officials and military garrisons that are usually posted at these towns creates a stable demand for farm and livestock products. Kompienga has hopes of emerging as a similar sort of trade and administrative center.

On the negative side, proximity to an international border introduces a whole new level of uncertainty into national, regional, and local development plans. Livestock disease control programs, for instance, must contend with a constantly fluctuating disease control environment, due to the difficulty of controlling livestock movements across borders. These areas also catch the

brunt of economic or social changes in the adjacent countries. The town of Kompienga and the Kompienga River basin, for example, were recently flooded with pastoralists fleeing from Ghana as the result of government policies hostile to them. This sudden influx of pastoralists and their animals put additional pressure on the area's indigenous land tenure systems and water resources, which were already under pressure because of immigration associated with the Kompienga Dam.

The recent downturn in the Côte d'Ivoire economy has had a similar broad impact on neighboring Burkina Faso. Growing numbers of migrants are returning to Burkina and settling in OCP zones (e.g., the Niangoloko area) rather than returning to their home areas. The worsening economic situation has also contributed to armed conflict between pastoralists and agriculturalists in northern Côte d'Ivoire, and the expulsion of thousands of pastoralists who also move into the OCP areas of Burkina Faso near the border.

The Future: Interrelationship with Other Migration Patterns

In the earlier section on settlement and immigration we considered the impact of a declining coastal economy and changing opportunity structures on migration patterns from the sahelian countries in particular. The downturn in the Côte d'Ivoire economy is resulting in a reorientation of immigration of young men to regional and national centers in some of the better-known migration "sending" areas. Reduced opportunities may encourage young farmers and pastoralists to develop commercial opportunities in OCP river basins having good agricultural potential, as well as to augment the labor resources of their extended families.

Shifts in migration patterns will undoubtedly be related to the rate and nature of new lands settlement. Areas undergoing rapid dynamic development—such as the *Compagnie Malienne pour le Développement des Textiles* (CMDT) zones in Mali,

the Mouhoun (ex-Black Volta) Basin in Burkina Faso, and the Mo Plain in Togo—will continue to attract large numbers of rural-rural migrants from other areas. We can also expect some shifting of these migration patterns, as sites that were popular in the initial period (like the Kossi, Mouhoun, Bougouriba, and Houet provinces in Burkina) become saturated. When this happens, some of the migration may move toward less populated basins.

Implications for Selection of Sites for Settlement Assistance

Settlers see both the economic potential and the problems of the OCP areas. Government projects can provide roads, bridges, water pumps, and animal and human health programs, but levels of national government support and donor funding for these features tend to be unstable. Settlers and indigenous inhabitants, both pastoral and agricultural, will therefore be understandably reluctant to invest heavily in the development of sustainable production systems in areas where the long-term prospects for offsetting constraints are not promising. In the less populated, higher potential river basins that are now being settled spontaneously, the pioneering initiatives of settlers require assistance that can be counted on.

We recommend, therefore, that national governments seriously consider putting their initial priority on developing sites to which immigrants would go even without special interventions. Experience has shown that high priority sites tend to be in areas with access to roads and existing population centers. Such advantages reduce the substantial degree of uncertainty that is invariably associated with the development of sustainable production systems. Special programs to develop promising areas (such as those suitable for dams) need to be planned carefully in order to incorporate some of the necessary urban functions normally fulfilled by proximity to preexisting population centers.

3

The Nature of Land Settlement

Types of Intervention in the Settlement Process

Sponsored, Assisted, and Spontaneous Settlement

New lands settlement can be characterized according to the degree of intervention by government or other agencies in assisting the settlement process.¹

In sponsored settlement, some government, private sector, joint-venture land development company, or NGO is involved in almost every phase of the development program, including: surveying and preparing the land; transferring and installing settlers and providing them with initial support; formulating and introducing specific production regimes and input packages; implementing such major technical innovations as irrigation, animal traction, and/or mechanized plowing; and providing infrastructural and service support.

In assisted settlements, one or more governmental agencies and/or NGOs provide some basic services and infrastructure for spontaneous settlers who move to a site on their own. One kind of assistance uses investments (e.g., in roads, water points) to attract settlers and guide them into preselected areas. Another approach to assisted settlement targets investments toward settlers who are already at a site.

Spontaneous, unassisted settlement refers to immigration and settlement by families without the benefit of formal sponsorship, support, or guidance. Spontaneous settlement typically

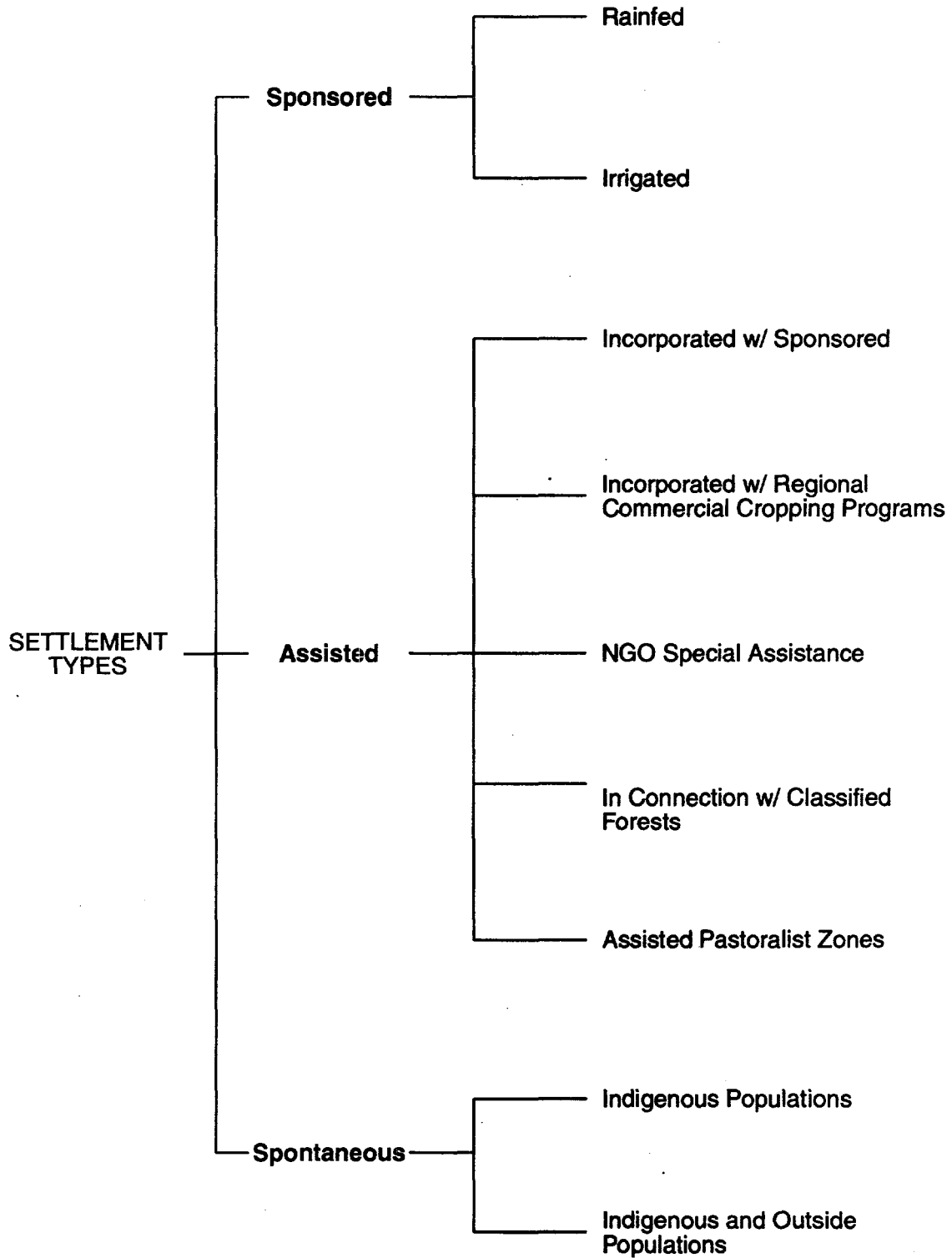
occurs in sparsely settled areas having little if any infrastructure or services, or in sparsely settled areas within or adjacent to sponsored settlements. The three Principal types of settlement are shown in Figure 3.1.

Recurrent Patterns of Government Intervention

In a number of cases, the assisted settlement interventions observed in the OCP areas emerged from sponsored settlement projects. These consisted of government-sponsored settlement projects that were modified at a later date to provide assistance to spontaneous settlers and host populations outside the project zones. The AVV in Burkina Faso and the FED-Agbassa Project in Togo exemplify this approach. In some cases (e.g., AVV), a rehabilitation component was included in older areas of sponsored settlement.

Other types of assisted settlement projects were often not originally conceived as such. One that has increased settler revenues involves incorporating immigrants into successful extension structures to support commercial cotton production. Examples from the case studies include the Dioila site in the CMDT zone of southern Mali and Solenzo in western Burkina. Another type of assisted settlement involves special programs by NGOs such as the programs of Global 2000, financed by the Sasakawa Foundation (Japan) in the Damongo region of Ghana, which attempt to reinforce existing extension efforts. Other experimental types of assisted settlement promote

Figure 3.1 Types of Settlement in the OCP Basins



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income-earning opportunities from sustainable forest products and livestock development. An example of the former approach is the multiple forest use project at the Classified Forest at Toumousseni, Burkina Faso; similar sorts of experimental programs are being encouraged by FAO throughout West Africa. Experimental livestock development programs typically include the delineation of special zones for use by pastoralists, such as the Nouhao, Sondre-Est, and Gadeghin projects in Burkina.

Some of the sites included in the LSR cannot be neatly classified as sponsored, assisted-spontaneous, or unassisted-spontaneous settlement. We often find a mixture of types instead. For example, areas of sponsored settlement such as FED-Agbassa in Togo, and the AVV planned settlements in Burkina, are associated with areas of spontaneous settlement. Similarly, in any area of assisted settlement, such as the commercial cotton programs at Dioila or Solenzo, the multiple forest use project (Toumousseni), or the Global 2000 programs in Ghana, there is always a group of, indigenous inhabitants or settlers who are outside the program, either by choice or lack of such prerequisites as family labor force or capital. Especially in Burkina and Mali, spontaneous and/or sponsored settlers are associated with increased pastoralist immigration—prior to or at the same time as other immigration to the area.

Dynamics of the Settlement Process

Regardless of external intervention or investment levels, successful land settlements follow a recurrent trajectory in which specific kinds of problems emerge at different points in the settlement process. These recurrent patterns have been described as a series of interrelated social and economic stages (Nelson 1973; Chambers 1969; Scudder 1981, 1985). The stages are predictable and they reflect the manner and results of settler adjustments in their new social, ecological, and economic settings.

Initially, settlers adopt a conservative stance in their new habitats, as their first priority is to reinstate basic food production levels and develop new social networks. In some instances, settlers are not able to move beyond subsistence (Christodoulou 1965; Nelson 1973). When they do, the majority shift from a risk-averse stance to a greater openness to risk taking (Scudder 1985).

This shift occurs only after settlers feel more secure in their new environment because of the production of sufficient food in the settlement area and increased settler incomes. While land use planning should start immediately, it is in the post-settling-in stages that one can anticipate the settlers' shift from their earlier emphasis on intensive agriculture to a more diverse range of investment strategies designed to achieve higher levels of productivity and higher living standards.

The entire five-stage process takes time. Finally, no type of government intervention in new lands settlement is complete until the activities have been taken over by a second generation of settlers, and the operation of many project-specific activities have been assumed by local, regional, and national authorities.

Given the predictable nature and sequence of the problems that occur during settlement, planning for OCP-area development can benefit from looking at the settlement process in terms of these five stages. Doing so will better equip planners to anticipate problems and formulate appropriate measures. Each of the five stages is described below.

Stage One: Planning

Comparative analyses of successful assisted and sponsored land settlement projects worldwide highlight the critical importance of advance planning (Scudder 1985). During the planning stage many crucial decisions are made about key issues, including site selection, type of management, type of settlers, type of production system or systems that are desired, and type of supporting infrastructure. Planning also considers the extent to which members of the host population will be included in the settlement process and more changes in terms of social, economic and political equity.

We recommend that planning incorporate information on production systems and the natural resource base from both existing data and well-focused studies, and from systems of indigenous knowledge concerning soil and vegetation types and values. Settler and host populations should be actively involved in the planning process from the start and in all other stages of decision making concerning the management and use of productive resources in settlement areas.

Stage Two: Initial Infrastructural Development, Recruitment, and Installation

Ideally, major construction of roads, water conveyance systems, and community infrastructure does not start until after planning is completed. A key planning problem at this stage involves decisions about how best to phase infrastructure development according to the needs of all including settlers, indigenous and pastoral households, administrators, and nonfarm households.

The concept of "recruitment" in assisted settlement should incorporate hosts and pastoralists with spontaneous settlers at both the community and catchment levels. Where sponsored settlement is to be linked with spontaneous settlement, such selection criteria as family motivation, labor-force size, area of origin, investment capital, and skills dramatically influence the types of resources settlers bring to the development process.

During both planning and recruitment it is especially important to consider the crucial concerns of female as well as male household members. Where a sponsored settlement is involved, both female and male household members should be interviewed during the selection process. Regardless of the type of settlement, failure to consider the needs of women can undermine social and economic status, and the welfare of the entire household and, by extension, the entire settlement.

Another set of issues has to do with installation patterns. Decisions about village layout, and about whether settlers from the same home village should be encouraged to remain together or dispersed, can have a major effect on long-term community development. One of the chief factors encouraging us to advocate assisted spontaneous settlement is that it minimizes the potential for social disruptions that can result from outside interference in the installation process. Again, the ideal here is to facilitate the settlers' resolution of important installation issues—e.g., where to live, near whom, and in what relation to the other ethnic groups and/or groups of origin at the site.

Stage Three: Adaptation (Settling In)

Whether settlers are spontaneous or sponsored, pioneering a new habitat is a more difficult and stressful undertaking than most planners realize. In addition to learning about a new natural environment, settler households must also adjust to

new neighbors. Under such circumstances it is understandable that their number one priority is to establish food security rather than to experiment with new cash crops under conditions where risks are high and returns are questionable.

In assessing returns on World Bank-assisted, government-sponsored settlement projects, Goering noted that "typically, evaluation of settlement projects three to five years after the start of implementation shows economic rates of return at least 50 percent below those in project appraisal documents" (Goering 1978:16). These findings can be explained in large part by the security-oriented, conservative stance of settlers during the settling-in stage. Given these conditions, settlers should have access to production support (extension, inputs, finance in the form of credit and grants, etc.) that will enable them to establish satisfactory consumption levels, support them in their risk-taking, lead to sustainable production systems, and bring the adaptation phase to an end. From the start, extension emphasis should be given to productive, profitable farming, including production of food crops (for consumption and/or sale) as well as higher value nonfood cash crops. Conventional extension, however, is not sufficient. What is needed from the start is institution building whereby—with the help of extension agents and NGOs—hosts, settlers, and pastoralists learn to work together to plan and implement improved management of their natural resource base. Such institution building for land use planning is a prerequisite for successful settlement in the OCP areas.

Just as attempts to promote new technical packages too fast should be avoided during this stage, programs that emphasize food aid should be used with caution. NGO and government agencies may wish to supply supplementary food and help with field clearance to ease the settlers' adjustments during the initial years. Assistance of this kind can be valuable, even essential, but it should be carefully monitored so as not to contribute to settler dependency and reduced initiative in later years. Improperly implemented food aid programs could also encourage certain families to migrate to a site that did not have the requisite physical resources to sustain them once special subsidies and food aid are removed.

Aid programs could also interfere with the process whereby the first settlers in an area seek sponsorship from the host population, generally

a vital first step in creating the necessary conditions for long-term social survival. Usually where other conditions were favorable (resource base, and the social and economic conditions for utilizing that resource base), the first generation of spontaneous settlers to the OCP areas showed a strong willingness and ability to sponsor later immigrants to the area. Thus, despite the temptation for government agencies and NGOs to focus on social programs in the initial adjustment phase, this is generally perceived as a less important problem by settlers than reinstating their production systems at levels equivalent to or higher than they had before immigration.

Stage Four: Economic and Social Development

People who are willing to leave familiar settings and colonize OCP river basins demonstrate considerable initiative. This initiative is the major factor underlying land settlement's development potential.

Stage four is characterized by a continued movement of settlers from a risk-averse to a risk-taking posture, evidenced most concretely in development of a widening range of strategies to increase labor productivity and diversify the household's base for generating real income. Such diversification involves a shift from the initial focus on crop production to a more diverse range of income producing measures: livestock-raising, dry-season farming, and off-farm income-producing activities.

One of the more dramatic indications of diversification in OCP areas is an increase in the number of large and small livestock, and a parallel increase in the number of conflicts having to do with livestock depredations. This is one of many examples of how the settlement process combines new promise with new problems. Planning can reduce such conflicts by zoning, and by integrating hosts, settlers, and pastoralists so that pastoralists can act both as herders and as providers of livestock products, including meat, milk, and plow animals.

Settlers worldwide tend to diversify their production systems as their incomes increase. With rising incomes, settlers purchase a greater variety of food stuffs, goods and services, thereby encouraging the establishment of more diversified farming systems, nonfarm enterprise and employment. The primary functions of government at this time should be to assist such diversification

by providing information relating to new opportunities, and facilitating improved linkages with outside markets.

The desire for diversification is linked to increased demands by the first generation of settlers' wives and children for semi-independent sources of income. This period is also associated with the initial waning of the high levels of crop productivity enjoyed by settlers on new lands. If new land is still available, settlers may move to clear it, to avoid the much higher cash and labor costs associated with intensification. If new land is less easily obtained and other factors (such as health facilities, or opportunities for education or nonfarm employment) have attracted them to their present sites, then settlers are more likely to be motivated to shift to greater levels of investment in sustainable crop production, provided, of course, they believe they have sufficient security of tenure.

Successful settlement of first-generation settlers based on diversified real income sources frequently leads to substantial increase in spontaneous immigration of agriculturalists and pastoralists to the area. This expands markets for local produce and offers other opportunities for exchange (including opportunities for pastoralists to herd host and settler stock, and provide plow animals), but it also increases competition for land (and the associated problem of crop damage by livestock). The indigenous inhabitants may see increased immigration and greater settler wealth as threats to their land rights and political authority, leading to conflicts between hosts and settlers. Developing solutions to these problems requires that host populations be involved in development planning from the start.

This stage of economic and social development is also associated with increased stratification among settler households. In the more successful settlement areas, a small percentage of households is highly successful. These are households with higher disposable incomes and greater access to labor. This increasingly visible group of highly successful first-generation immigrants is likely to become the first generation of entrepreneurs, reinvesting their returns from crop production in commercial and transportation enterprises in the region. Where opportunities for local or regional investment are limited, however, they are likely to save the money and/or invest it outside the region—in the sending areas, in areas where long-term prospects for a more diversified

pattern of production enterprises look better, and/or in urban centers.

At the other extreme, 20 to 30 percent of settler households in the more successful OCP settlements are poorer than the rest. These households tend to be older couples without adequate access to labor and capital, more recent immigrants who are still adjusting to their new habitat, smaller households that are also short on labor, and late arrivals who may be given less and/or poorer quality land for settlement. The needs of each category are quite different.

Stage Five: Handing Over and Incorporation

Handing over entails a transfer of responsibility and control over decision-making processes and key resources from specialized settlement agencies to settler and other local institutions, and to government line agencies. It also involves the incorporation of settlers' children and other dependents into the settlement process. This is vital. Given the conditions of many West African land tenure systems (notably the lack of cash values for land), long-term investments in sustainability are based largely on settlers' assumptions that at least some of their children will be able to prosper within the local farming system. If not, it is in their long-term best interest to "mine" the area and move on.

The planning domain of incorporation draws attention to the process by which a settlement area becomes an integrated part of the surrounding region. This can occur only where existing government structures have the human and capital resources needed to ensure that required services and support are available to the settlement area after the break-up or transformation of specialized settlement agencies, or the termination of special development programs implemented through line ministries. The overall sequence from planning to handing over can be expected to take more than a single generation.

Costs, Cost Reduction, and Cost Recovery

Costs

The existing literature on land settlement as a development intervention focuses primarily on planning issues in connection with government-sponsored settlement. The record for such settlements in sub-Saharan Africa and the OCP

countries has not lived up to expectations. Even the simplest projects have involved substantial investments, and yet they have failed to meet their goals of increased production and employment.²

Planners and evaluators alike have properly criticized settlement projects for their high direct investment costs. Costs per beneficiary family in rainfed settlement programs funded by the World Bank from 1962 to 1975, for example, were estimated at \$6,460 (Goering 1978). By the mid-1980s, costs for Bank-assisted rainfed projects ranged from \$5,000 to \$20,000 per family, the higher costs being for tree-crop settlement schemes in Malaysia (World Bank 1985). At that time worldwide irrigation costs invariably exceeded \$10,000 per household, with African costs exceeding those in Asia and Latin America.

It has frequently been concluded that the same investment of capital and resources in the development of low-resource agriculture in an established cultivation zone could have provided employment for, and increased the living standards of, a larger number of people (Mellor 1966; De Wilde et al. 1967; Moris 1968). This is one reason why we recommend simultaneous development of both sending and receiving areas. Increasing evidence, however, shows that many of these earlier assessments of planned settlement schemes were based on premature evaluations that underestimate the longer-term multiplier effects associated with more successful projects (Scudder 1981). If planned settlements are to yield significant benefits, they usually require relatively large initial investments to offset the multiple constraints to development in isolated areas where projects tend to be implemented. Unfortunately, most evaluations of planned settlements deal with projects that are still in their initial stages, when it is unreasonable to expect rapid increases in production, net income, and nonfarm employment.

Assisted settlement is less expensive than sponsored settlement on a per household and per hectare basis, but it is still a relatively costly development intervention. The need for physical infrastructure such as roads and potable water supplies, and for social and economic services drives costs up. In all types of rainfed settlement, assisted spontaneous settlement included, roads are the largest single cost.

Cost Reduction

During the LSR, special attention was paid to ways in which costs could be reduced, or better distributed over time. Though cost reduction was only one of a number of factors taken into consideration, many of the recommendations in this report will reduce costs to government agencies because these recommendations involve less ambitious approaches to land settlement, and because they involve cost sharing with local populations and NGOs.

Except in special situations (involving dam construction, for example), we are recommending rainfed as opposed to irrigation-based land settlement, assisted spontaneous settlement as opposed to government-sponsored settlement, and development of the less isolated areas that spontaneous settlers prefer as opposed to remote areas with poor access to roads, services, and markets. For planning and implementation we are recommending use of line ministries and other existing agencies as opposed to special settlement agencies, and we recommend the active involvement of local populations (including hosts, settlers, and pastoralists) and NGOs. Not only are such approaches less expensive than the alternatives, but they have other major development benefits described in later chapters.

Cost reduction can begin at the outset of the planning process by involving local populations. Involvement here has two meanings. One is the involvement of indigenous knowledge which, for example, can reduce the costs of soil surveys and mapping settlement areas. The other is making use of local initiative by relying more on local organizations; their involvement can significantly reduce administrative costs.

Roads are an important factor in successful settlement, and they will continue to be the major cost regardless of settlement type. However, feeder road costs can be reduced from over \$30,000 per kilometer to about \$2,500 by constructing one-blade roads designed for bicycles with trailers and pushcarts. Proposed for reducing the burden on women of headloading produce to local markets in Ghana, such a low-cost approach is especially applicable to assisted spontaneous settlement. As for market centers, it is far cheaper to upgrade and improve access to existing centers and regional towns than for governments to create new centers. This approach to combining decreased cost with increased access

to transportation and communications in OCP areas should be considered as a supplement to, and not a substitute for, well-built and well-maintained feeder roads.

In regional and integrated-area development approaches, where borrowers and donors alike have been tempted to provide a complex package of "instant infrastructure" from the start, costs have escalated. While we believe that properly planned and implemented assisted settlement can generate major spread effects, including regional development if enough people are involved, interventions must be carefully prioritized and phased. The Solenzo area of Burkina Faso and the Dioila area of Mali are examples of sharply focused extension and input programs that were successful in allowing a first generation of settlers to achieve dramatic increases in income from cotton cultivation, but where the focus was too crop specific and narrow. Increased productivity was at the expense of soil fertility, partly because a land management component has only recently been phased into the extension program.

Prioritization and phasing imply planning and implementing a series of components that are compatible with the natural resource base and the evolving needs of settlers as they pass through the various stages of the settlement process. While needs will vary from area to area, generally speaking, access roads, potable water supplies, and simple medical facilities have the greatest priority during the initial settlement stage; these are followed by markets and primary schools. A cost-reduction advantage of assisted settlement is the diminished need for expensive infrastructure for employees of special settlement agencies, as compared to additional housing and transport for such government personnel as extension workers, health assistants, and veterinary assistants.

Cost Recovery

It is best to acknowledge from the start that it will be very difficult, if not impossible, to recover capital development costs from assisted settlers in the eleven OCP countries. Whether spontaneous or sponsored, settlers are poor people struggling to achieve food self-sufficiency during the first few years of the settlement process. Even where yields per hectare are far greater, running in tons (as on irrigated settlement projects) as opposed to hundreds of kilograms (as with rainfed yields of food crops in the OCP countries), cost recovery

from settlers is a very difficult task that can be expected to last 20 years or more in even the most successful settlements, like Malaysia's FELDA schemes. A wiser approach, and the one we recommend, is to facilitate the emergence of viable local organizations at district, settlement area, and village levels that can take on increasing

responsibility for maintaining feeder roads, and operating and maintaining potable water supplies once food security is achieved. In other words, the emphasis should be on meeting recurrent costs as opposed to recovering capital development costs.

Notes

1. The voluminous literature on the nature of land settlement and on land settlement as a development intervention includes many Ph.D. dissertations. Selected references are Lewis 1963; Christodoulou 1965; Chambers 1969; Chambers and Moris 1973; Nelson 1973; Weitz, Pelley, and Applebaum 1978; Goering 1978; Scudder 1981, 1984, and 1985; Van Raay and Hilhorst 1981; World Bank 1985; United Nations Centre for Human Settlements 1986; Oberai 1988; and Schumann and Partridge 1989.

2. See, for example, Hilton 1959; Mellor 1966; De Wilde et al. 1967; Chambers 1969; Nelson 1973; Goering 1978; Dettwyler 1979; Scudder 1981; World Bank 1985; and United Nations Centre for Human Settlements 1986.

4

The Potential of Land Settlement in the OCP Areas

Success

If carried out in a supportive or at least neutral policy framework, and if properly facilitated by government and nongovernmental agencies over an extended time period, the settlement of new lands by thousands of low-income households has considerable potential as a national development strategy. To realize its potential at the local level, settlement must be environmentally sustainable as well as economically and socially successful. To be economically and socially successful at the community level, land settlement should also give rise to increased productivity, raised living standards of the settlement population, and socially viable communities in which settlers, the host population, and pastoralists can interact without destructive conflict.

Where large enough populations are involved, successful land settlement can also be expected to have major multiplier effects in the surrounding region and even at the national level. If settlement is successfully implemented, a majority of settler households can significantly increase productivity and raise their living standards. As living standards improve, settlers everywhere use their increasing disposable income in similar ways. They improve their housing; they complement home-grown produce with purchased foodstuff; they buy livestock and equipment including bicycles, plows, and carts. Some of the goods and services desired can be produced locally, with rising demand stimulating employment through

the development of markets and nonfarm enterprises. Since it is the rising disposable income of thousands of small-scale producers that drives development forward during the early stages of industrialization (Johnston and Kilby 1975; Mellor 1986), land settlement clearly has the potential to catalyze the development of the more favorable OCP areas.

This positive view of the development potential of land settlement reflects research throughout the tropics and subtropics, and is a departure from conclusions from earlier studies and evaluations based on data collected during the initial years of settlement. These earlier evaluations tended to be pessimistic because settler performance during the settling-in stage (Stage 3) rarely achieved the goals set by planners during the project appraisal process. Experience has shown that these goals were unrealistic in light of the initial emphasis of most settlers worldwide on relatively risk-averse strategies for meeting household food security needs. More recent studies (including LSR research in Burkina Faso) that have focused on later stages of the settlement process in more successful settlements have shown the potential of land settlement not only for raising productivity and living standards of settlers, but for generating multiplier effects within the encompassing region.¹ We believe that the prospects for successfully realizing the potential of settlement are good throughout the affected areas of the eleven OCP countries because of their natural resource base, in particular their better quality soils.

Overview of OCP Area Outcomes—How Much Success?

The LSR case studies show several instances where settlement in the OCP river basins has had a dramatic impact on economic development. Cotton production in the isolated Niangoloko subsector of Burkina has grown from 50 tons in 1985-1986 to 500 tons in 1987-1988—largely due to Burkinabe migrants returning from Côte d'Ivoire and moving into the Leraba and Comoe river basins. Similarly, large increases in commercialized food crop production have been associated with rapid new lands settlement in the Upper Nakambe (ex-White Volta), Burkina Faso, and the Mo Plain, Togo. In the FED-Agbassa (Togo) area, production of major food crops (sorghum, rice, maize, and groundnuts) increased tenfold, from 513 metric tons in 1977 to 5,193 tons in 1988; cotton production increased five times, from 79 tons in 1979 to 373 tons in 1988. Some have argued that Burkina Faso suffered less from the 1983-1984 drought than from earlier drought years because of the availability of "surplus" food from the newly cleared OCP areas. Large areas of the Mouhoun (ex-Black Volta) River Basin and Mali's Dioila region that are within the core of the OCP zone have become major cotton exporters.

Longitudinal research on the AVV-sponsored settlements at Mogtedo in the Nakambe (ex-White Volta) River Basin shows that in 1979, after three to five years of living in the new area, settlers were earning an average income that was substantially higher than that being earned by the average farm family in their home area during the same cropping year (McMillan 1983). Follow-up research with the same group of settlers during the mid-1980s and again during 1989 as part of the LSR, has shown a continued pattern of income growth for the first ten to fifteen years of planned settlement, with some farmers becoming extremely wealthy and eventually moving from the area (see McMillan, Nana and Savadogo 1990). Even higher levels of income per unit labor were observed for new settlers in the town of KOMPIENGA and the older settlements in the unassisted commercial cotton area near Solenzo. Our data suggest, for example, that settlers at the Mo Plain (Togo) and Dioila (Mali) sites also experienced steady income growth during the early years of settlement.

One good indicator of increased incomes in the different areas is market development. The

Broukou market, for example, which has become the main market for the FED-Agbassa settlers, had by 1989 emerged as a major regional trading center for small livestock, food, and other cash crops. Traders from as far as 250 kilometers away come to the market. Similarly, strong market development has occurred in the Mo Plain, in large part due to increasing production of yams by settlers since the early 1980s, and their need, in turn, for commodities.

While it is important at the start to emphasize the potential of land settlement, it is equally important to counsel caution; this is because the full (that is, long-term) potential is not easily realized by either spontaneous settlers or sponsored settlers. Ghana is a case in point. Most spontaneous settlement into the OCP areas of Ghana continues as part of an age-old process whereby poor farmers move back and forth between river valleys and adjacent uplands (Hunter 1966). With minimal assistance from the government and an unfavorable policy environment toward the food crops that settlers typically grow, such settlement rarely allows individual households to move beyond subsistence.

In the one major case where government attempted to help spontaneous settlement in Ghana during the 1970s, unrealistic policies subsidized the crops of a small elite at the expense of the local population. The result was an increase in conflict, including the burning of crops. Moreover, when subsidies ended, the economic viability of these crops was undercut. As for sponsored settlement, whether at Tono, Damongo, Akosombo, or Kpong, productivity and living standards are relatively low, and few multiplier effects have occurred. Even in Burkina Faso, Mali, and Togo, where spontaneous and sponsored settlements have raised living standards in some of the river basins and adjacent zones to a point at which significant multiplier effects have emerged, the present systems may not be environmentally sustainable.

In part because of the multidimensional environmental, economic, and social difficulties involved in new lands settlement, policies to facilitate settlement in the river basins must be linked with intensification of sustainable development in areas (like the Dogon and Mossi plateaus) from which settlers come (see Annex 3). Investment in such sending areas makes sense for several reasons. First, it is far cheaper. Costs for raising crop yields through improved water

retention, for example, are only several hundred dollars per hectare, while in the sponsored settlement of new land such costs can run into thousands of dollars per hectare, even for rainfed agriculture. Second, successful programs to promote development in sending areas can slow down spontaneous migration to the river basins, giving governments additional time to carry out the soil, hydrological, and socioeconomic surveys needed for planning settlement area development. Third, it is virtually impossible to draw a strict line between investment in the two zones, given the propensity of settlers to seek out investment opportunities in the sending areas as they diversify their household economies.

The current situation is not one in which the national governments in OCP countries can or should opt for a development strategy based exclusively on facilitating new lands settlement or intensifying production in established cultivation zones. Both options need to be addressed. What is at issue then, is what types of planning models might be most effective to deal with new lands settlement that is already occurring and is likely to occur, so that the process is sustainable, and feeds into national development plans in desirable ways.

Prerequisites for Success

Because of the complexity of land settlement, it is imperative that governments understand: (1) the nature and dynamics of the land settlement process, and (2) the risks, on the one hand, of doing nothing (spontaneous unassisted settlement) and, on the other, of formulating overly ambitious development plans (e.g., capital-intensive sponsored settlement). The middle road advocated in this report is the facilitation of spontaneous settlement of new lands through assistance from governments and NGOs. It is an approach that allows development planners to build on the recognized strengths of spontaneous settlers (initiative, social networks, local knowledge, and good relationships with the local community), and to avoid some of the better documented social, ecological, and economic problems of unassisted settlement. The latter include relatively low productivity, accelerated rates of environmental degradation, low levels of economic and social services, and lack of support for intensive cultivation practices.

Case studies of several hundred settlement areas reveal disappointing results for government programs that try to promote sustainable farming and regional development. However, analysis of exceptions (Scudder 1981; World Bank 1985) such as northern Parana (Brazil), Wolamo (Ethiopia), various FELDA Schemes (Malaysia), Minneriya (Sri Lanka), and Papua New Guinea Smallholder I and II, as well as the Normal Scheme in Zimbabwe (Akwabi-Ameyaw 1988), illustrates the potential of new lands settlement to generate sustainable systems of production and higher living standards for low-income households, which in turn stimulate regional development through nonfarm enterprise development and employment generation. Analysis of these success stories also indicates certain underlying prerequisites for success that can be adapted to specific OCP areas. These prerequisites can be broken down into three broad categories: the initiative of the settler population, the development of environmentally sustainable production systems, and a favorable social and economic environment.

Initiative of the Settler Population

Increasingly, prescriptions for sustainable development in Africa emphasize the importance of supporting the initiative of small-scale farmers and entrepreneurs and their families (see, for example, Akwabi-Ameyaw 1990, on Zimbabwe). Such an approach is especially applicable to settler households and communities because of the development potential of their investment strategies. While the case studies document a range of strategies, the evidence strongly suggests that settler households first attempt to establish food self-sufficiency. Households also diversify their production systems by adding or shifting to higher-value crops and investing in livestock. In addition, some family members initiate commercial activities or enter wage employment. More successful households also tend to allocate more family labor and savings into a wider range of ventures including land accumulation and commercial activities in the settler area, in the nearest regional town (and eventually in urban centers), and in the sending area. More often than not, the development strategies of the settler households are more dynamic than those of the settlement planners. This is why we emphasize throughout this report the need for planners to facilitate such initiative rather than to superimpose preconceived development programs.

Effective Use of the Natural Resource Base

Study after study worldwide has shown that spontaneous settlers in the short run become better farmers in less time and at a lower financial cost than do government-sponsored settlers. The evidence also shows, however, that the extensive production systems used by spontaneous settlers not only degrade the environment but also have few spread effects because of low productivity over the long term. Studies also show that in the absence of outside investment in roads, wells, extension, and social services, the disposable income of spontaneous settlers has generally been insufficient to support the development of more productive and less ecologically destructive agricultural systems.

Favorable Social and Economic Environment

Although relatively favorable soils and environment in the river basins as compared to the sending areas increase the potential for development in the eleven OCP countries, settlers tend to be more vulnerable (because of their isolation and other constraints) than residents in the sending areas to unfavorable government policies and actions regarding rural development. To offset this vulnerability, favorable producer prices for the major crops grown in settlement areas and favorable opportunities for obtaining the necessary inputs and for marketing crops are essential.

In addition to economic viability, special attention should be paid to the social viability of settlement areas so that they become areas where families wish to put down roots. Constraints that need to be overcome are isolation, lack of amenities, scarcity of social services, and conflict with the host population—all of which interfere with the formation of viable communities. To reduce isolation, improved communications and transportation between sending and receiving areas have importance for all family members. Essential amenities include access to potable water supplies, fuelwood, basic medical facilities, primary schools, and local markets.

Need for Appropriate Models for Assistance

Two broad models of government assistance are recommended, both of which should encourage active partnership in developing OCP areas among the local population (including hosts and

pastoralists as well as settlers), the private sector, NGOs, and government agencies. Planning should commence as early as possible in the settlement process, and it should not be restricted to the least populated areas. As in the case of the less isolated AVV-UP1 (Planning Unit 1), where settlement began in the 1970s, and Solenzo, there is still time to involve local populations in zoning, managing, and developing settlement areas in an environmentally sustainable fashion. In such cases, government assistance can provide the same sort of rehabilitative function that donors are urging for irrigation systems with respect to physical infrastructure and to water management and other participatory local functions.

Assisted-Guided Models

The first type of assistance is applicable to all eleven countries. It involves targeted investment in infrastructure, like roads or extension services both for existing spontaneous settlers and to encourage or guide new settlers to move to areas that are deemed to have higher potential (in terms of accessibility, capacity of the natural resource base, and willingness and ability of the resident population to incorporate strangers). Soil and hydrological surveys are essential for identifying appropriate areas for cropping systems, livestock management, and natural resource reserves. Equal emphasis should be paid to the systems of land tenure, land use, and natural resource management of the host population. Where roads, bridges, and culverts are absent, they must be provided and maintained. The same applies to potable water supplies, markets, and social services. Use of low-cost procedures and careful phasing of inputs can significantly reduce costs.

Sponsored Settlement in Combination with Spontaneous Settlement

The second type of assistance combines a relatively small core area of planned settlement with a much larger surrounding area in which spontaneous settlement is facilitated. Requiring more careful planning, and involving higher costs per settler household and hectare developed, this type of assistance should be restricted to special, high-potential situations. One example would be isolated riverine habitats in which special projects, such as dams, are intended. There, with appropriate long-term planning, special facilities

like construction sites can become regional centers for serving the development of the surrounding area.

Combining sponsored and spontaneous settlement in such situations has several advantages. First, it broadens the participatory base of land settlement to a wider range of low-income people since sponsored settlers are usually poorer than spontaneous settlers when they first arrive. Second, although settlement is seldom an effective technique for significantly reducing population densities in sending areas, it can have an important local impact in such areas if settler selection is geographically restricted and is combined with such land management devices as consolidation and water-retention programs to create more viable landholdings for those who remain. Third, and most important, sponsored settlement is more easily combined from the very beginning with the introduction of relatively sustainable farming systems, and with the provision of extension and social services, market facilities and other urban functions, than is spontaneous settlement. The more sustainable farming systems can then be extended to hosts and spontaneous settlers as they arrive, with all service-center facilities designed to serve the entire population of the settlement region.

Applicability of the Proposed Models to Special Needs and Concerns of the OCP Areas

The two types of recommended government assistance are models that can be adapted to a wide range of situations associated with actual or projected new lands settlement. The precise model to be proposed depends on whether interventions are started early or late in the settlement process. The type of intervention which is appropriate will also depend on national policies and the existing institutional base, as well as on such special situations as proximity to a classified forest, a wildlife reserve, or a major city; a sudden influx of immigration associated with a dam or other development; or an economic crisis that forces return migration. Early experiences with the Global 2000 program in northern Ghana and with NGO-sponsored settlement in Mali's OCP areas illustrate how NGO resources can work in either model.

Two examples of assisted settlement that were highly successful in terms of income growth and regional economic development are the Solenzo region of Burkina Faso and the CMDT region of

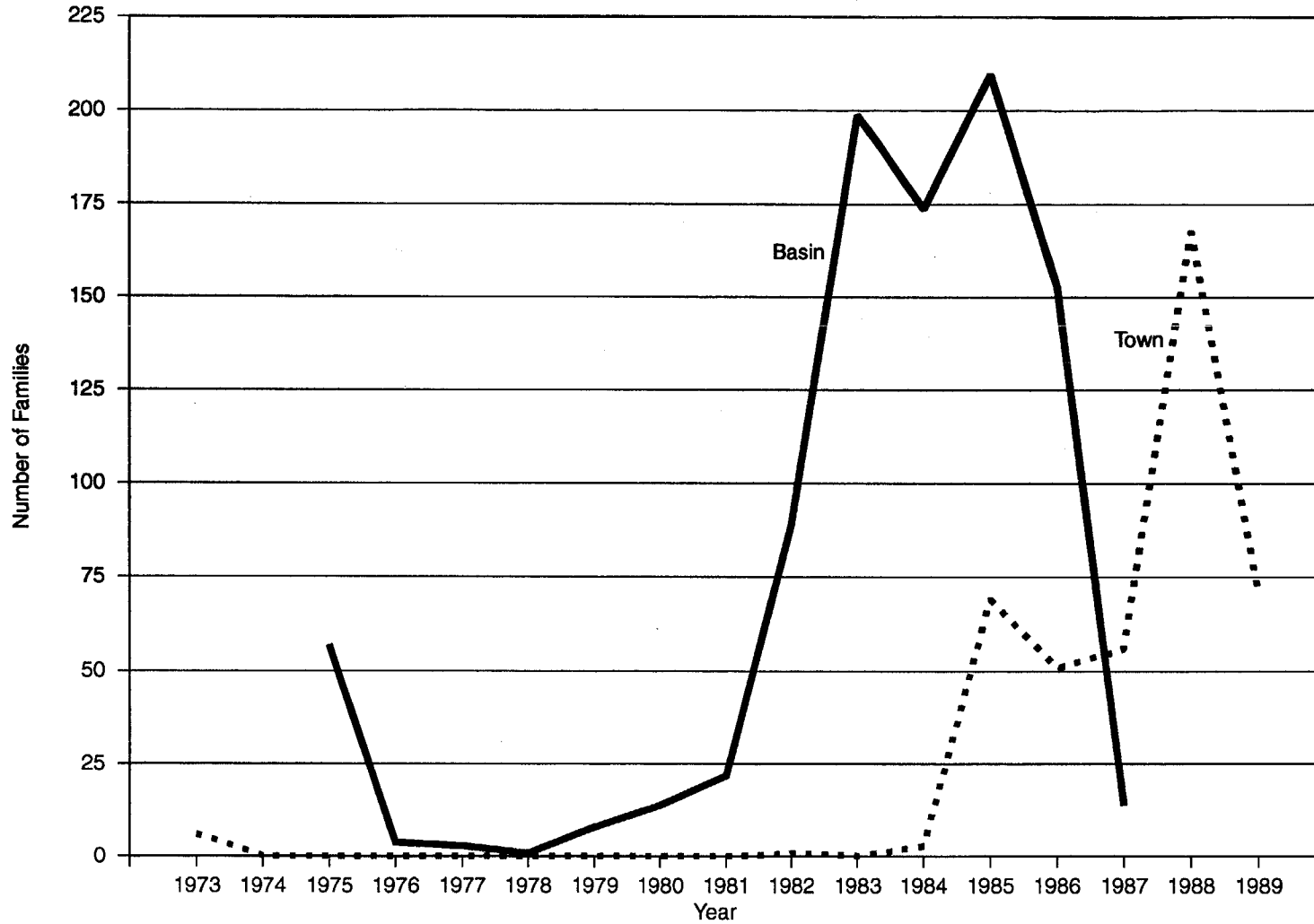
Mali. Both areas benefited from a major effort to promote cotton, and both were being actively resettled before OCP started in 1974, despite high levels of onchocerciasis infection in certain areas nearest the rivers. In both cases success could be seen in increased production, higher living standards, and regional economic impact. While the focus on cotton is not a viable alternative for less-favored ecological settings, the existing programs represent a major development experience that should be incorporated into future planning for a more diversified economy.

Good examples of development potential associated with a combination of sponsored and spontaneous settlement come from Togo (FED-Agbassa) and Burkina Faso (AVV). In each country several relatively small planned settlements attracted a large number of spontaneous settlers. Increased output from the settlement areas stimulated the emergence of a sizable regional market as well as smaller but active markets. While significant differences seem to have emerged among various groups of sponsored settlements in terms of their overall profitability and sustainability—differences that appear to be linked to market access and to the types of extension programs that were promoted—the overall model is a useful one that deserves critical attention. To incorporate hosts and pastoralists, and to move toward a more sustainable land use system, village land management associations have promise (Chapter 9).

The two assisted settlement models (one with and one without a core of sponsored settlement) can also be adapted to a variety of special planning issues. One involves the need to control the effects of settlement on classified forests or wildlife reserves. Research conducted on a pilot project to promote income earning from renewable forest resources in the Niangoloko region of Burkina Faso suggests that this sort of effort could be usefully incorporated into a regional program to promote assisted settlement.

A second subset of planning conditions involves dams and special projects, like roads or industrial wood projects, that attract substantial numbers of spontaneous settlers to the site. Some idea of the suddenness with which this can occur and consequently overload existing extension and social services can be seen in the Kompienga case study. Immigration to the basin shows a dramatic increase after the construction of a road in 1983 connecting the basin to outlying areas. The sudden increase in immigration was especially

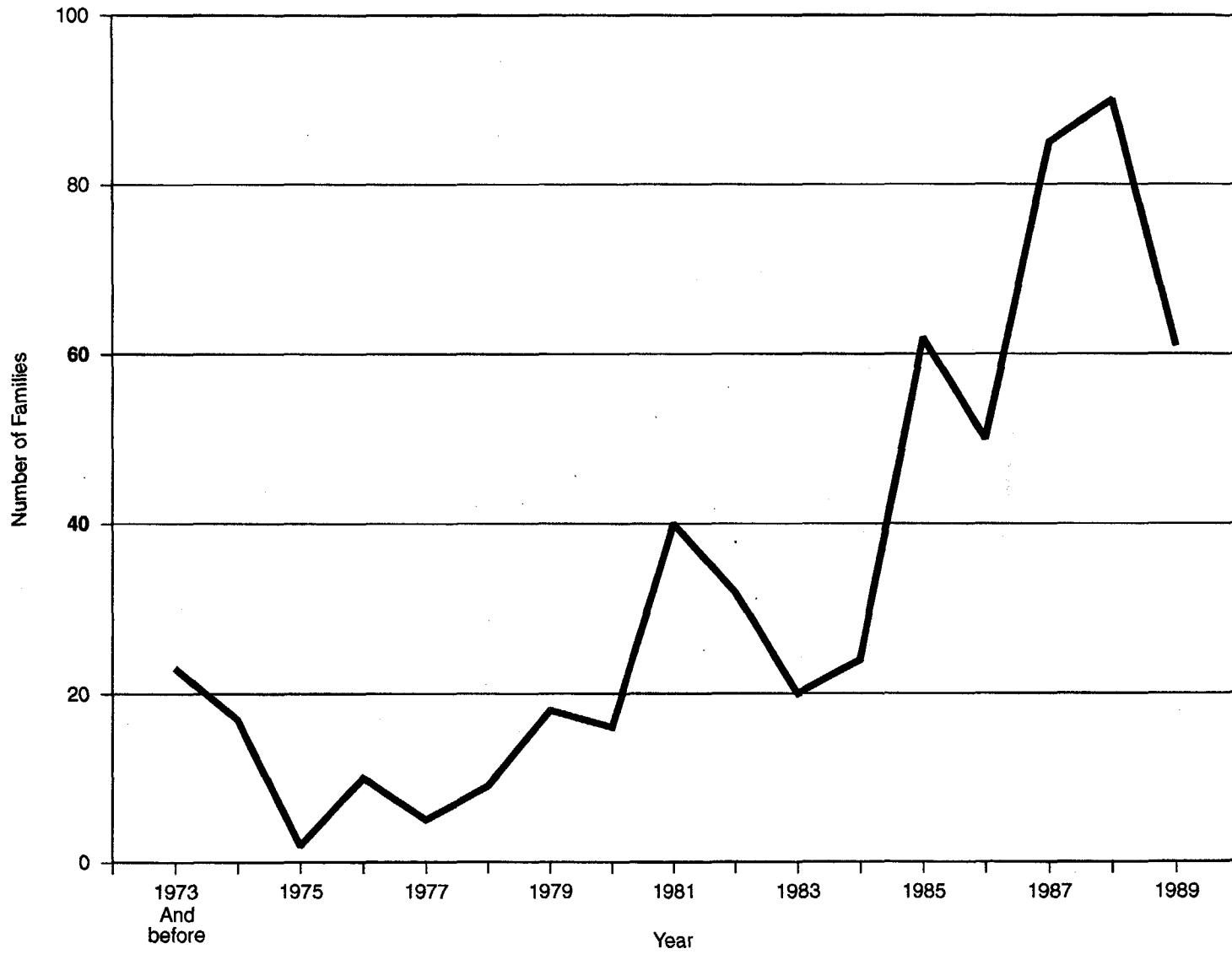
Figure 4.1 Year of Immigration for Settlers Living in Kompiengo Town and other Villages in the Basin*



* Research on Kompienga Basin immigration conducted in 1988; census of Kompienga town conducted in 1989.

Source: Agrotechnik 1989 and McMillan 1989

Figure 4.2 Immigration to the Niangoloko Subsector



Source: Nana 1989

noticeable for the area around dam construction headquarters in the town of Komienga (Figure 4.1). In OCP areas of Mali, equally dramatic increases in numbers of labor migrants and fishermen were associated with the construction of the Manantali and Selingue dams. Similar sorts of rapid spontaneous settlement can be expected whenever dams are constructed. The potential for using dam construction sites as a focus for assisted settlement has been neglected in all OCP countries, where settlement assistance has generally been restricted to the much more complicated, more expensive, and seldom successful involuntary resettlement of populations living in future reservoir basins.

Dam construction provides an especially clear example of how targeted investments in roads, bridges, and other infrastructure that alter the long-term economic potential of an area can galvanize immigration. Completion of a bridge over the Mo River in Togo and a central road through the Mo Plain in 1983 have had a similar dramatic effect. Total population in the Mo Plain region has grown from 3,500 in 1960 to approximately 25,000 inhabitants today, a major portion of them apparently having arrived since 1983. The speed of such increases in spontaneous settlement tends to overload administration and extension services, making it difficult to help settlers to

develop more intensive, sustainable production systems. Targeted use of planned settlements as service centers can facilitate this process.

Sudden increases in settlers may also occur in response to an economic downturn in another sector or country, or to major policy changes. One example of this is the unanticipated population increase in the border area of Niangoloko since 1983, as Burkinabe immigrants return from Côte d'Ivoire (Figure 4.2).

A different set of planning issues is posed in OCP areas near cities, including border towns. These areas are typically the first to be settled spontaneously, even before control is established. Civil servants and entrepreneurs are attracted to such places because the sites offer opportunities for commercial farming near their primary workplaces. As these peri-urban zones have been shown to be major suppliers of food for the cities, their planning needs must be addressed (Little 1989). Sudden increases in pastoralist immigration into the southern river basins of Burkina, including the Komienga, Comoe, and Leraba basins, was caused by mounting agriculturalist-pastoralist conflict in northern Côte d'Ivoire and official expulsions from Ghana. In both cases the sudden increase in "return" pastoralists has caused conflict between agriculturalists and pastoralists in the receiving river basins.

Note

1. For examples of more recent, more optimistic assessments of the land settlement potential based on a better understanding of improved performance during the latter stages of the

settlement process, see Weitz, Pelley and Applebaum 1978; Van Raay and Hilhorst 1981; Scudder 1985; and World Bank 1985.

5

Importance of Planning the Development of OCP Areas Within a National and International Context

Integration of OCP-Area Development into National Development Strategies

While the OCP to date has been an international program financed through an Onchocerciasis Fund administered by the World Bank, socioeconomic development of OCP areas is a national prerogative. Such development should be integrated within national development plans for each country, and, with some exceptions, planned and implemented by existing institutions.

We base this recommendation on several factors. First, OCP encompasses such a large area—over 50 percent of national territory in some cases—that it would be impractical to set it aside for special development. Second, OCP areas do not exist in a vacuum. Because they are problem prone, their development is heavily influenced by national policies toward rural development, and by the extent to which they are tied into national infrastructure and markets. The high degree of settler mobility between settlement and sending areas (with the more successful settlers apt to invest in both), results in settlement-related development investment with an impact far beyond the settlement areas themselves. Third, because fiscal, managerial, and institutional resources are scarce, the eleven countries cannot afford to establish and maintain new institutions for OCP-area development.

In Mali, the core OCP area in the Third Region is the most developed part of the country, while the OCP areas of Burkina Faso have the highest

development potential. Malian policymakers wish to pursue a balanced development strategy that will not encourage an outflow of people from the less favorable agroecological zones in the northern portion of the country by disproportionately emphasizing OCP areas to the south. In Ghana, the Côte d'Ivoire, and Togo the situation is reversed: the more favorable coastal areas are outside the OCP zone. These three governments have attempted, with uneven success, to reduce regional disparities by targeting investment in the northern areas. In both types of situation, uneven development in OCP countries can best be addressed at the national level.

Addressing imbalances of this kind requires that governments plan development of OCP areas in relation to national development goals and with a view toward balanced development. One way is to link the development of major sending areas outside the OCP zone (such as the Dogon and Mossi Plateaus) with development in OCP areas elsewhere in the country. Demarginalizing most OCP areas requires infrastructure, services, and financial and human resources. If governments at the same time give greater attention to improving the productive potential of sending areas, they will render them better able to support growing populations, and eventually reduce the long-lasting disparities in development assistance that have been magnified in some countries by investment in OCP areas. Our recommendations also reduce disparities within OCP areas by emphasizing phased, assisted settlement of

larger numbers of spontaneous settlers, as opposed to capital-intensive government-sponsored settlement of smaller numbers.

Importance of a Favorable Policy Climate for Settlement Success

The need for a favorable policy climate is particularly acute in most land settlement areas because they tend to be isolated, and often lack infrastructure, market towns, and the basic social and economic services that OCP countries in West Africa have been promoting since independence. At the same time, existing host populations of sponsored settlement areas, invited or ordered by national governments to share access to productive resources with outsiders, often look on with some dismay and resentment as government and settlement agencies accord favored treatment to settlers. Thus land settlement areas may combine difficulty of access and other problems with considerable potential for conflict over changing terms of access to productive resources. For such reasons they tend to be more affected by the urban bias of national development policies (Lipton 1977) than is rural development in general.

The importance of a favorable policy environment for rural development in the OCP countries and Africa in general is a constant theme in recent reports and evaluations. A case in point is a recent United States Department of Agriculture report on "Technology and Agricultural Productivity in the Sahel" that emphasizes the need to change urban-biased policies concerning wage rates, food imports, and exchange rates (Jayne, Day, and Dregne 1989). The absence of a favorable policy climate is more than a simple hindrance to successful settlement. Because of the significant levels of investment necessary for settlement assistance, counterproductive policies (or an absence of policies) can waste government funds and technical and human resources. More importantly over the longer term, land settlement in the absence of supportive policies represents a lost opportunity for national development.

Policy Areas of Particular Importance to Settlement

The case studies reveal several areas where policy is especially relevant to successful settlement. These are rural-urban terms of trade; terms of smallholder access to production inputs; rural-

urban linkages in regard to communications and urban functions; linkages between land settlement and area development planning; linkages between new lands settlement and development in sending areas; and linkages between small sponsored settlements and nearby areas undergoing spontaneous settlement.

Rural-Urban Terms of Trade

The emergence of a broad-based development dynamic centered around settler production of food and nonfood crops requires government price policies that allow producers to achieve satisfactory earning levels. More is involved, however, than the impact of rural-urban terms of trade on settlers' earnings. Settlers' perceived returns on their investments of scarce labor and capital also affect their commitment to the community and to the settlement area. Their perceptions also affect their willingness to shift from an initial risk-averse, often anticonservationist, stance to a more risk-taking mode in which they invest in technology and production systems that are more likely to be sustainable.

Agriculture accounts for 50 percent of the Gross Domestic Product (GDP) in Mali, 47 percent of GDP in Ghana, and 35 percent and 27 percent of GDP in Burkina Faso and Togo respectively. Agricultural production involves 80 to 90 percent of the inhabitants of these countries. Despite its importance to the livelihoods of urban and rural dwellers alike, agriculture has not been well rewarded. Policies of the OCP countries have not, until recently, provided significant incentives and support for agricultural production, whether for members of host and settler populations in OCP areas, or for smallholders in non-OCP areas.

A combination of government policies contributed to this situation in the case study countries, among them: taxes on export crops; government prohibitions on grain exports by private parties; parastatal marketing boards that give producers a small percentage (in some cases less than one-third) of world market prices for their produce; minimum wage levels in the agricultural sector that decline while minimum wages in nonagricultural sectors rise; and rural-urban differentials in consumer price indexes for food and nonfood items that favor urban areas. Factors over which individual governments have no or little control have also contributed to a situation where the rewards for agriculture are meager. In Mali, for

example, a marked deterioration from 1984 to 1986 of world cotton prices while the CFA franc was appreciating relative to the dollar made the economic viability of cotton problematic. The cost of inputs, by contrast, more than doubled between 1977/78 and 1986/87.

Since the mid-1980s, all the case study countries have instituted economic reforms that aim to improve rural-urban terms of trade; to provide smallholders with greater incentives to produce and invest in production; and to increase their opportunities for realizing returns on their production. These changes include reducing export taxes and giving producers a larger share of world market prices for production marketed through parastatal structures (*Société Togolaise du Coton*—SOTOCO, CMDT, etc.). Such policy changes appear to concentrate their benefits on export crop production, principally cotton. Relatively little attention is given to production of staple food crops.

Terms of Smallholder Access to Production Inputs

A related issue concerns the terms of settlers' access to extension services, production inputs, and credit. Extension services in Burkina Faso, Mali, and Togo have been effective in increasing cotton production. Similar efforts are needed to develop sustainable production systems having a greater emphasis on a range of food crops in association, where feasible, with livestock production.

Settlers need assistance in making the shift from relatively low-risk extensive farming methods to riskier intensive modes of production. This transition requires them to invest more in production technology relative to labor so as to increase production per hectare, but such investment can be expensive. If production credit is unavailable, or available only for targeted crops such as cotton, patterns of technology adoption may be skewed. For example, if chemical fertilizers, insecticides, and associated inputs are available on credit solely for cotton production, they are likely to be used largely or almost exclusively for the production of that crop, with very little applied to staple food crops.

In some instances (Dioila, Mali; Solenzo and the AVV planned settlements in Burkina Faso), staple food crops may benefit from the follow-on effect of fertilizer use in cotton fields. In other instances (FED-Agbassa, Togo, and the Damongo settlements in Ghana), the spread effect of fertilizer use on cash crops may be very limited, with the overall result that both settlers and extension

agents observe multiple indicators of declining soil fertility (decreasing production, proliferation of weeds, parasitic plants, etc.), despite significant per capita levels of fertilizer consumption.

Government policies on subsidies and prices for production inputs also have an important impact on smallholders' access to and use of technologies that enhance productivity. The OCP countries have been under pressure from lenders and donors during the 1980s to reduce input subsidies. The impact of resulting government policy changes in the case study countries is best seen in the case of fertilizer. Subsidy levels have declined sharply and smallholders have been faced with marked increases in the prices they pay for fertilizer. As a result, access to fertilizer by all but the most successful settlers in OCP areas has been reduced.¹

Complaints about the high price of fertilizer and the frequent lack of credit (particularly for food-crop inputs) were very common among the settlers who were interviewed during the country case studies. Settlers repeatedly declared that they could no longer afford fertilizer. In some cases individuals stopped using it; in others they used much less.

The multiple individual responses by smallholders in the case study countries to government policies of increasing input prices, which are described in the case studies, are mirrored in aggregate patterns of input use. In Ghana, increased fertilizer prices left the government with very large carryover stocks of unsold fertilizer in 1988 and 1989. In Mali, producers are said to be substituting manure for fertilizer. While manure is a valuable fertilizing agent, access to it, like access to chemical fertilizer, is not widespread. Many smallholders do not own cattle and have no access to persons who do. In Togo, records at the FED-Agbassa project show a decline during the last two to four years both in fertilizer purchases by settlers and in the average size of their cropped areas. In all cases, these patterns are a response to higher input prices.

If fertilizer is used, it is cash crops, particularly cotton, that benefit most. An estimated 115,700 hectares of land in Togo, for example, were treated with fertilizer in 1985; of the total area, food crops accounted for only 8 percent; cotton absorbed the remainder. In both Togo and Burkina Faso, two-thirds of imported fertilizer is used on cotton. In Ghana, it is estimated that 100 percent of areas planted in cotton and tobacco are fertilized. The figure drops to 75 percent for millet/sorghum, and 20-25 percent for maize.

Our analysis showed similar results. Fertilizer tended to be used only on crops that were sold—mostly export crops like cotton, for which there was a guaranteed market. Almost no fertilizer was used on cereals. It would be a mistake, however, to attribute the lack of use of fertilizer on cereals only to the high price of inputs. In the absence of more stable annual and interannual prices for cereal crops, it is unlikely that very much fertilizer would be applied to these crops. The reason is simple; it is not profitable.

In the longer term, government development policies that reduce settler access to productivity-enhancing technologies exact a heavy cost on the national economy—increasing the prospects for a deteriorating natural resource base. In effect, what is good for the national accounts may not be good for settler household-producers in the short run, and may have detrimental long-run effects not just on rural producers and the resource base, but on the nation as a whole.

Possible solutions, discussed in later chapters, will require imaginative approaches that link rural finance and fertilizer use with natural resource management. Some degree of public support and informed guidance should be considered in the case of settlers. Briefly, alternative approaches include some degree of subsidization—not to be rejected out of hand—or grants during the settling-in period. This support should be combined with guidance by relevant government agencies and NGOs to make residents of settlement areas aware of the importance of longer-term sustainability and the negative consequences for their livelihoods of nonsustainable practices.

Their extension-based guidance should also explain concretely what the guidelines mean in terms of the practice of natural resource management, and present an array of effective and potentially useful techniques. These should include, in addition to the appropriate use of fertilizers, anti-soil erosion and water management/harvesting techniques, approaches to incorporating organic matter in the soil, alternatives to massive burns for land clearing, and more effective integration of livestock in agricultural production systems.

Support should also provide settlement area populations with incentives to practice more sustainable methods. It is important that consideration be given to making access to credit and inputs, degrees of subsidization, grant size, etc., contingent on evidence obtained and evaluated both by community representatives in local land management groups and by assisting government

agencies, that settlers are making an effort to invest in the natural resource base, and, in the long run, in the future of their families.

Rural-Urban Linkages

As Van Raay and Hilhorst have emphasized (1981), proximity to market centers and regional towns is a correlate of successful settlement, while Weitz and his colleagues at the Rehovet Center for Settlement Studies emphasize a hierarchy of service centers, from the small village market to primate cities (1978). Our case studies confirm that in OCP countries as elsewhere, such linkages require improved communication in the form of roads and transport services.

With relatively good access to Bamako, and astride the major highways to Côte d'Ivoire and Burkina Faso, the Third Region in Mali is the most developed area in the country. In Burkina Faso, Linoghin is the most successful example of development in the AVV-UP1 area in large part because of its easier access to Ouagadougou. Conversely, the development of Ghana's "Overseas" area and Togo's Mo Plain suffered in the past because of poor communications and poor access to major cities.

Land Settlement as a Component of an In-country Regional Development Strategy

Successful land settlement has the potential for generating major spread effects in the surrounding region. In certain OCP countries significant spread effects have already occurred. Spontaneous settlers have moved into areas inhabited by a smaller number of sponsored settlers in Burkina Faso's AVV-UP1 area, for instance. Still-to-be-realized potential is shown in the case of Togo's Mo Plain, where modest infrastructural improvements in the early 1980s opened the area to increasing numbers of settler families. The settlers have transformed much of the plain from a sparsely inhabited area, covered largely by climax Guinea savanna vegetation, to the country's prime yam-producing region. Incorporation of the Mo Plain into a regional development strategy is especially challenging because the area is cut off from its administrative center by a mountain range. Geographically and economically, the plain has much stronger links to eastern Ghana and the town of Bassar to the northeast than to areas east of the mountains, where Soutouboua, the administrative center, is located. With proper

settlement support, a plan for the region could make Bassar its center.

Capturing spread effects from land settlement does not require regional development or integrated area development projects. It does require, however, a planning perspective that emphasizes production system diversification and increases in households' disposable income as well as increases in the production and productivity of particular crops. If planners are willing to facilitate the initiative of spontaneous settlers, integrate settlers with host populations, decentralize management responsibilities to local organizations, utilize the strengths of NGOs, and prioritize and phase in physical and social infrastructure, such a perspective also need not carry large financial costs.

Linking New Lands Settlement with Development of Sending Areas

We have already introduced the problem of disparities between settlement and sending areas in OCP countries in terms of access to development resources. Another aspect of the national policy climate is the extent to which governments are willing and able to plan and obtain financial backing for development interventions in both the higher-potential new land settlement areas and the lower-potential sending areas (see also Annex 3). A national and regional planning commitment of this kind should be able to:

- Improve the basis for livelihoods of populations in areas that have become known in each of the OCP countries as "traditional" areas of emigration, thereby helping to reduce out-migration from these areas.
- Reduce pressure on settlement areas, thus provide planners some breathing space to obtain the information they need to design more effective approaches to sustainable assisted settlement.
- Slow the processes of uneven development and deterioration of resources that have characterized the OCP countries since the colonial era, and that have been accentuated by imbalances in development planning since independence.

Because the major sending areas (e.g., the Mosi Plateau of Burkina Faso; the sahelian zone of Mali) are often characterized by lower rainfall levels and poorer quality soils, the constraints on efforts to upgrade their production potential are considerable. Nonetheless, a variety of water management methods and soil erosion-control techniques have been developed in the OCP countries since the 1970s, and in some cases (e.g.,

Kabye terracing and pit composting in Togo), have been used in high population-density areas for generations. These approaches to improving productivity are worth exploring in conjunction with national policies that are supportive of smallholders in their endeavors to improve and in some cases, recover, essential soil qualities, and to develop more intensive, sustainable systems of production. Because of higher population densities, and more intensive forms of agriculture in partial response to such densities, farmers in sending areas are apt to be more favorably inclined to such land management techniques than are farmers in frontier settlement areas where land is not perceived as being scarce. To complement risky rainfed harvests, they may also be more favorably inclined toward small-scale irrigation and such controversial nonfarm activities as tourism (as in the Dogon area of Mali).

Linking Small Sponsored Settlements with Assisted Spontaneous Settlement

No matter how small, sponsored settlement is expensive in terms of government and donor resources. We are not advocating sponsored settlement as a general strategy, but there are apt to be special cases where it warrants serious consideration. Two examples, which may be combined within a single area, relate to isolated areas of relatively high potential, and to the implementation of such special projects as dams. In such cases, a small sponsored settlement in association with a service center has the potential of catalyzing the development of a wider area.

The Kompienga area in south central Burkina Faso combines settlement potential with a special project. At Kompienga, construction of a dam has resulted in rapid spontaneous settlement since the mid-1980s by families attracted by the services created for the dam site, the proximity of the area to the Togo border, and future opportunities for irrigated dry-season farming. The situation is ripe for a regional approach. With this in mind, the Burkinabe government required, as part of the arrangements for financing the dam, that data be collected for regional planning purposes. While the quality of the data is adequate, the local-level planning and implementing institutions that should have intervened following completion of the dam have suffered from insufficient financing.

The demonstration effect can be powerful if the demonstration is successful. Where governments are concerned with the pace and impact of spontaneous settlement in an area, but do not have the

financial capacity or are reluctant to use a larger-scale sponsored approach to settlement, a small nucleus of sponsored settlements might be considered for a possible demonstration effect and for the planning flexibility that a low level of intervention permits.

Linking existing sponsored settlements to spontaneous settlement can also expedite rehabilitation and land management programs. An example of this approach is the assisted spontaneous settlement project created in 1987 by the AVV-UP1 in the Rapadama region of Burkina Faso. The pilot project calls for the use of the planned settlements created at the site in 1980 as service centers from which to launch a wider regional program to incorporate spontaneous settlers with sponsored settlers into joint village land management committees. The village committees in turn promote the use of sustainable production patterns as well as tighter regulation of land access and use by new immigrants.

Linking OCP-Area Development to West African Development Strategies

Both the pioneer settlement of new land today and the seasonal movements of pastoralists continue a process of rural-to-rural migration that has been going on in West Africa for hundreds of years. Since the early nineteenth century, these population flows have been intensified by the seasonal movement of individuals to the plantation areas of the coastal countries and to the cities of inland and coastal countries alike. Because those involved in such movements often cross international borders, national policies toward immigration can have profound impacts on the development of OCP areas, many of which straddle international boundaries. Restricting the transhumance zone, for example, and the consequent departure of Burkinabe pastoralists from Côte d'Ivoire in 1986 and from Ghana in 1988, has had

undesirable impacts on all three countries. In Burkina Faso and Ghana it has increased the potential for conflict among hosts, settlers, and pastoralists in the OCP areas along the border. In Côte d'Ivoire it has reduced the availability of meat in the coastal cities, and hindered government efforts to increase access to livestock in the country. The location of many OCP areas close to an international border also encourages legal and illegal flows of goods across borders, especially where currency convertibility and major differences in prices and exchange rates exist. Such location also contributes to the development of market towns, like Niangoloko on the Burkinabe-Ivoirian border, that could become urban centers for settlements on both sides of the border.

Settlement, dam construction, and other development interventions in upriver zones within international river basins can have adverse ecological impacts on downriver countries. The Guinea highlands are the source of the Senegal, Niger, Gambia, and several smaller rivers flowing directly to the coast; thus, strategies pursued in Guinea's OCP areas are bound to have international impacts on other OCP areas. The potential benefits of development planning may also be international. For example, the largest area suitable for irrigated agriculture in conjunction with Komo-pienga Dam in Burkina Faso is located across the border, in northern Togo.

In providing financial assistance, donors should consider programs and projects that have an international impact. An obvious example is UNDP's interest in the management of the upper catchment basins of rivers originating in the Fouta Djallon of Guinea. There is also a need to assist countries with contiguous OCP areas in developing zoning for transhumant pastoralists. It may be feasible to create such zones just as international parks have been established by cooperation between West African countries.

Note

1. Smallholders are paying more for fertilizer (NPK) in all the OCP countries as a result of decreasing levels of government subsidies for retail fertilizer prices and increasing world fertilizer prices. In the case of Ghana, the marked increase in fertilizer prices also reflects a sharp devaluation of the cedi from an exchange rate of \$1/C2.75 in 1983 to \$1/C301 in 1984. Fertilizer prices there increased more than 200-fold (from C15 per 50 kgs to C3,430 per 50 kgs) from 1980 to 1989, while subsidies declined from 65 percent to 15 percent.

In Burkina Faso, the retail price of fertilizer increased from 35 CFAF/kg in 1980 to 96 CFAF/kg in 1988. Meanwhile, subsidy levels

fell from 63 percent to zero. In Mali, the price increased from 105 CFAF/kg in 1982 to 140 CFAF/kg in 1986, and subsidies declined from more than 18 percent before 1985 to zero in 1987. Prices for cotton in Mali were low. During the 1980s, the CMDT in Mali was paying cotton producers prices that were consistently among the lowest of all African countries in the franc zone. In Togo, the retail price of cotton fertilizer increased from 15 CFAF/kg in 1980/81 to 115 CFAF/kg in 1987/88, while subsidies were cut from 80 percent to zero. (IFDC 1987:63, 163; Dapaah and Otinkorang 1988:5, 9, 12-13; Burkina Faso 1988/89:72,74; Lackner and Partner 1989: I/18).

6

Land Tenure

Security of Tenure

A prerequisite for successful land settlement is security of tenure to land and water resources as defined by both settler and host populations. Land resources include not only village sites and arable land, but also grazing and browse for livestock, and such natural products as thatching grass, firewood, and wild produce. Water resources include potable supplies for people and their domestic animals, as well as fishing rights. Emphasis should be placed on security rather than on one type of control over land versus another. Security is here defined as those conditions under which hosts, settlers, and pastoralists are willing to make permanent investments in land (including soil conservation and tree planting), water resources, and housing without fear that they or their descendants will lose access to those resources and improvements. While complete security is a utopian concept, procedures can be taken to increase the degree of security and lessen the probability of conflict. These procedures are outlined in this section. Since different people define security in different ways, no optimal system of land tenure can be recommended under present conditions in the OCP countries. This point is important given the propensity of national governments in Africa to claim state ownership of land (with major exceptions such as Ghana, where customary control under chiefs continues), and of donors to promote private ownership of land.

The local system of land tenure must be the starting point in seeking to provide security of tenure to hosts, settlers, and pastoralists, but alone it is not sufficient because of conflict between hosts and settlers, or between land custodians and their own constituents. First, while settlers can gain access to land relatively easily under customary systems of tenure when land is seen as relatively plentiful, conflicts are inevitable when land is perceived as scarce. Second, although hosts are usually willing to allow settlers to pass on use rights to their descendants, the fact that hosts maintain residual rights to the land renders settlers hesitant to make permanent improvements that may alienate the hosts and incline them to reclaim the land. Third, as settlers improve their living standards and seek political independence by establishing their own villages and chiefs, the possibility of conflict increases. Fourth, local custodians of the land may demand increasingly onerous "tribute" as the economic condition of settlers improves. Fifth, cases abound where hosts agree to allocate land to elite outsiders or to government projects at the expense of their own constituencies.

Notwithstanding such difficulties, customary systems of tenure provide a better starting point than either state ownership of land, national land registration legislation that favors individual tenure, or a combination of the two. Comparative evidence demonstrates that when applied to river basins, both state-initiated approaches may increase conflict between hosts, settlers, and pastoralists, and between local residents and more

powerful individuals from outside the area who do not necessarily settle, but perceive the area largely as a profitable investment. The danger of accelerating conflict is especially serious in the river basins of drought-prone arid and semiarid lands because of their higher-potential soils and the availability of water for irrigation. Completion of the Manantali Dam on the Bafing River (Mali), the major tributary of the Senegal River, coupled with state ownership of land and a 1983 land registration law favoring private land development by wealthy "outsiders" with capital, is probably the major cause of serious conflicts within Mauritania and between Mauritania and Senegal in the lower and middle Senegal river basin, where wealthy "outsiders" (White Moors) are taking over land at the expense of resident Pulaar villagers with customary tenure (Horowitz 1989). In Somalia, a similar land registration act passed in 1975, along with the government's intention to build the Baardheere Dam on the Juba River, has escalated land grabbing by wealthier "outsiders" (ARD 1989), and contributed to the spread of civil war within the country. Competition over the waters of the White Nile with respect to how decisions were made, and plans implemented, for constructing the Jonglei Canal are believed to have contributed to renewal of civil war in the Sudan (Zanen 1988), while in Sri Lanka's dry zone, river basin development in connection with the Accelerated Mahaweli Programme has increased ethnic conflict over irrigable lands.

While such major conflicts have yet to emerge in the OCP areas, increased competition over land has already begun and can be expected to escalate. The warning signals are in various OCP countries and in several IDA study sites. In both Sierra Leone and Togo, hosts have requested the return of bottomlands that settlers have developed (Hunting Technical Services 1980c: F340 and F356). In Ghana's "Overseas" area, competition between wealthier "outsiders" and hosts led to instances of arson in the paddy fields of the former. In Burkina, conflict between hosts and settlers in AVV-UP1, where the state allocated land to settlers with little support from, or participation of, the host population, has adversely affected development. In Mali, Koenig concludes that the greatest need for security of tenure is "for the security of tenure of average farmers against both wealthy individuals and the state" (personal communication, April 1990). Looking to the future, the potential for conflict between

pastoralists and farmers is especially serious. IDA recommendations relating to the formation of land management associations (Chapter 11) have the dual purpose of improving management of the natural resource base and reducing the potential for conflict.

The Nature of Customary Land Tenure Systems and State Intervention

The history of access to land and water in the OCP areas prior to state intervention has been one of customary tenure. Planners do not always appreciate that resources even in very sparsely settled areas have long been subject to local custom. Specific features of local tenure vary within and between areas included in the case studies, but the overall similarities make possible a composite description.

Chieftaincies or local authorities (as trustees for members of local communities) routinely administer agricultural land. Core membership in communities is often defined by a combination of ascriptive criteria—including ethnicity and descent—linked to early settlers and/or village founders, chiefly or notable lineages, etc. "Ownership" of rural land is often vested in the lineage as a corporate group, with a senior member of the group acting as administrator. Routinely, members obtain use rights to land owned by the corporate group by virtue of their membership in that group. While heads of household can then pass on use rights to that land to their heirs, the corporate group retains residual "ownership" rights.

Outsiders obtain access rights to land in one of two ways. Women from outside the corporate group can marry in, and, by virtue of their marital links to lineage members, request land for production. Attribution of land to spouses is not automatic in the OCP areas, however, and the modalities of women's access to land vary from separate fields, to small parcels within the household head's field, to no land at all. Male outsiders, often heads of households, who want farmland must obtain permission from the recognized community head or land custodian to farm and settle, a process that may involve some mediation by a community member (the settler's sponsor or contact), as well as largely symbolic offerings by the outsider to the local authority. These may include kola nuts, fowl, money, or local alcoholic beverages. In addition to these initial offerings, the settler may have to pay periodic "tributes."

Typically, these consist of a small portion of the annual harvest, but they may also include occasional unpaid labor prestations to the local community head, land chief, or sponsor. If the settler satisfies these local requirements and conforms to community norms of appropriate social behavior, the settler may reside in the community, use the land indefinitely, and bequeath the use of it to his heirs. The land is not the settler's property, however; it belongs to the community.

There are numerous ways of circumventing this admittedly idealized model of customary tenure procedures. Settlers who claim privileged status, by virtue of ethnicity, wealth, power, or sponsorship by and connections with local influentials, including government authorities, can bypass or buy off lower-level authorities. In other cases, seekers of agricultural land may be government civil servants. Because of their access to the state (and state resources) and the fact that they also may be part of the government mechanism for regulating development and land use in the area, they possess added leverage in securing land from local authorities. Once they obtain access to land, their salaries and easier access to loans from development banks put them in a better position to develop and hold onto the land than members of the host population. Finally, the state can intervene directly, claiming that all local practices and prior arrangements are void, and appropriate large tracts of land for a variety of purposes ranging from developing infrastructure to creating forest reserves, national parks, airports, dams, military bases, and settlement schemes for rainfed or irrigated agricultural production.

Government intervention in OCP areas invariably alters the conditions of access to land, especially when governments take control of large tracts for settlement schemes, very often without compensating host populations that are displaced or lose control over ancestral lands. This causes long-lived resentment by host populations toward government authorities and settlers, resentment frequently manifested in host-settler conflicts (incursions and attempted reacquisition of settlers' land by local people, occasional physical violence, crop burning, poisonings, sorcery, and the like).

Another form of resistance by host populations to government interventions that provide settlers with land by negating, ignoring, or circumventing local tenure practice is best described as "social lock-out." Disgruntled local people may boycott new markets organized by settlement agencies in

settler areas, leading to stagnation or market failure (AVV—Mogtedo and FED-Agbassa). Local people may also block access of settlers to local opportunity structures, for example to trading spots in markets, trade in specific commodities, or participation in specific remunerative activities as occurred in the dynamic Mogtedo market in Burkina Faso. Local political authorities may also increase their demands for tribute in the form of cash, other gifts, and labor for their fields.

Government intervention often introduces another level of control with respect to land use. Once governments have claimed the right to replace local tenure mechanisms, they often seek to control settler decision making about how land is used. Settlers on schemes may face as many as three superimposed systems that determine access and use of land: local tenure practice, government land tenure reform laws, and day-to-day decisions by settlement agency and project management staff about the organization of production on the land (as with Togo's *Projet FED-Agbassa*). The result for settlers can be a high degree of anxiety about security of tenure and decision-making autonomy, resistance to government incursion, abandonment of settlement sites, and husbandry practices that lead to land deterioration. Thus, clarity concerning the terms of land access and land use is greatly to be sought.

Conflict over Land in OCP Areas

The case studies show that conflict over access to land is a frequent occurrence in OCP settlement areas. These conflicts involve host populations, settlers (whether sponsored or spontaneous), and often pastoralists. This is true where access to land is mediated solely by local, customary practice, as well as where access is mediated by some combination of government agency intervention (e.g., the AVV in Burkina Faso, the FED-Agbassa project in Togo) and national land tenure or rural code (e.g., reforms and rural codes introduced in Mali in 1986, in Burkina Faso in 1984, and in Togo in 1974).

The bases for conflict in areas of spontaneous settlement include perceptions by indigenous (host) populations that too many settlers are coming into the area too quickly; that land acquisition by settlers is forcing hosts to travel farther to open new fields (and to commute over longer distances to work them); and that the land-absorbing, extensive cultivation practices of settlers are threatening the use of fallows and the availability of land for

the next generation. Another, indirect, source of tension can occur in initially small host communities where the rapid influx of settlers changes the host-settler power balance, occasionally manifested in accession by settlers to village headman posts and other positions of influence and power.

In areas of government-sponsored settlement, host populations may harbor resentment toward settlers who are allocated parcels (frequently with some accompanying infrastructural and government service support) that had been part of the ancestral lands of the host population. Tension is heightened even more when land taken by the government is taken without compensation (e.g., Tono Irrigation scheme, Ghana; FED-Agbasasa project, Togo; and AVV-UP1, Burkina Faso). Even when governments acquire land following consultation with local authorities, they may face opposition from the indigenous population. Consultations may be perfunctory or involve corruption. Moreover, it is difficult to imagine land custodians being able to oppose acquisition requests from more powerful government representatives, regardless of whether a development package is offered to the area.

Agriculturalists and pastoralists often oppose each other over land claims. The OCP areas have long been used by transhumant herders to trek their herds between the sudano-sahelian zones to the north and the savannas to the south. In addition, pastoral groups have often favored the low-density river valleys as excellent sources of browse, graze, and water. Movement into these areas by settlers, be they spontaneous or sponsored, disrupts customary pastoralist access to pasture resources and corridor areas. By the same token, incursion of herds into cultivated areas, with the associated crop damage, have also been a source of conflict between cultivators and pastoralists. Pastoralists have been under increasing pressure in the OCP countries since the late 1960s. Several major droughts have driven them southward from the sahelian and sudano-sahelian areas in search of better grazing. At the same time, cultivation zones have drifted northward into pastoral and transition zones during periods of higher rainfall. The result has been less room for maneuver for the pastoralists and added conflict as both agriculturalists and pastoralists claim increasingly scarce resources. This situation has worsened since the 1980s because of the involuntary return of many pastoralists from Côte d'Ivoire and

Ghana, leading to even larger influxes of pastoralists into the OCP areas of Mali and Burkina Faso.

The case studies do reveal several instances, however, where government intervention has facilitated settler access to land *without* angering or alienating the host populations. In Mali, the government's Manantali Resettlement Project (PRM) served as a liaison between host villagers and settlers who had been displaced by flooding of their home areas when the nearby *Organisation pour la Mise en Valeur du Fleuve Sénégal* (OMVS) high dam was constructed. With their role limited to the physical resettlement of people, PRM facilitated negotiations between host villagers and resettlers over new village sites. Once agreement was reached, the settler villagers completed all necessary local formalities, and host villages ceded both use and customary control rights to the settlers.

The smoothness of the Manantali operation was attributed to the sparseness of the host population and preexisting marriage links between the host and settler populations. Disputes arose soon after the beginning of settlement, however, largely because of faulty planning. No provision had been made for fallow lands, some resettled villages were located too close together, and the newly demarcated village boundaries did not allow sufficiently large inter-village buffer zones for expansion of cultivated areas. The last constraint is likely to arise everywhere sooner or later.

How to Proceed

Lessons learned during the land settlement review suggest a number of procedures for increasing security of tenure and for reducing (but not eliminating entirely) the potential for conflict. Their execution requires the involvement of both local populations and government agencies, with or without the assistance of NGOs.

1. During the planning stage, surveys of local systems of land tenure are just as necessary as surveys of the natural resource base.

Discussion: Government planners must understand the features and processes of change that affect local tenure in settlement areas, and when a significant gap exists between actual practice and the ideology of local land tenure custom, they must be willing to intervene on the side of more equitable access. The case studies show that local custom is only one avenue of access to land. Others include ethnicity, connections to well-placed

government personnel or local chiefs, and the capacity to buy off local authorities.

Planners should consider local tenure practice as a potential resource for land management rather than something to be circumvented or replaced. Planners must, from the very beginning, involve both host and settler populations in discussing and clarifying terms of access and in planning procedures for handling claims and conflict.

2. After such surveys have been completed, hosts, settlers, and pastoralists in the area should be involved in a zoning exercise not only to designate areas for village sites, agriculture, livestock management, and natural resource reserves, but also to address the question of land use and land tenure. Since, ideally, rights to allocate land in the new settlements should be transferred to the new communities of users, government should acquire land only after surveying the customary system of tenure and consultation with the host population. (While, alternatively, individual rights to land might be negotiated, such an approach is more difficult in OCP zones where a private land market often has been weak. Exceptions might include small communities of sponsored settlers, especially in peri-urban groupings around market centers and towns).

Discussion: Once planners are familiar with local land tenure principles and practices, they should assist hosts and settlers in working through and amending the provisions of the indigenous system to ensure that all parties have a clear understanding of and agreement about the terms of land access and use in the settlement area.

Government intervention (especially expropriation) that supersedes or circumvents customary authorities and practice is likely to induce feelings of anxiety and resentment among host and settler populations about their security of tenure. However important it is that governments understand and work through local arrangements to avoid initial disagreements, something more is needed to safeguard tenure. A promising approach entails creating local organizations with full decision-making authority and government backing to handle land management decisions.

An example of this approach can be seen in the newly-created village land management organizations (the PNGT and GTV) in Burkina Faso and Mali. A significant challenge facing this kind of organization is how to deal with the cases of claimants who are not "typical" smallholder

settlers. These include the state itself, large commercial farmers, wealthy, well-connected merchants, or well-placed government personnel, occasionally acting in concert with village headmen or other powerful local authorities (who may also be relatives). Strong, clear government backing is essential for the success of these local-level organizations. Settlers in all the study areas where village land management committees are being implemented successfully emphasize the importance of state-level recognition of their position and role. In the absence of this *de facto* as well as *de jure* transfer of power to local levels, "devolution," "decentralization," "grass-roots emphasis," and similar slogans are meaningless.

3. Because the hosts lose land in the zoning process, they can accept it only if they as well as settlers benefit from a development package aimed at increasing productivity, disposable income, and living standards in the area.

Discussion: It is essential that hosts see themselves as benefiting from the intended development. The experience with compulsory resettlement in connection with such development projects as dams is that cash compensation is unsatisfactory, since monies received are rarely channeled back into sustainable development—with the result that those so compensated become worse off (Cernea 1988). Rather, hosts should see themselves as benefiting from improved roads and access to markets, improved extension services, provision of inputs for a tested technology to intensify production and increase income, and such social services as medical facilities and schools.

4. Adjudication procedures should be established and explained from the start to deal with the inevitable conflicts that will arise.

Discussion: The land management associations recommended by IDA, and discussed in more detail in Chapters 11 and 12, are analogous to water-user associations for irrigation projects. In both, local institutions should have conflict-resolution capabilities and responsibilities. These alone, however, are not sufficient. Where internal conflicts cannot be resolved, and where conflicts involve community members against outsiders, local communities must have access to a more formal system of adjudication in a timely and supportive fashion. Such access may require new legislation and strengthening of the judicial system to deal with land, water, and other natural-resource management issues.

7

Lessons Learned about Production at the Household and Community Levels

Centrality of the Household in Sustainable Economic and Social Development for the OCP Areas

When sustainable development occurs in a given area, it is the cumulative result of decisions made by hundreds, indeed thousands, of small-scale producers. These individual actors respond to a particular range of social, economic, and environmental opportunities and constraints at the local (community), regional, and national levels—opportunities and constraints that are importantly influenced by the norms for land tenure and government policies described in this document. Immigrant and indigenous household members are also responding to the particular needs of their own families within that wider local, regional, and national context.

The strong influence exerted by the family—in determining the opportunities and constraints of individuals, as well as their material well-being—is reflected in the centrality of the term “household” for development planning in general, and OCP-area planning in particular. The household (or *ménage*) is the basic unit used in descriptions and analyses of rural land use and production systems (McMillan 1986, 1987a, 1991). Statistics about production or wealth report household income. Statistics about per capita production are generally based on household means weighted across all households or households grouped according to such characteristics as land tenure, ethnicity, income levels, or management practices.

The working definition of a household is a domestic social structure in which most members live in the same place and cooperate in organizing production, distribution, and consumption of produce. Because it is the locus of economic activities and the primary determinant of the cultural and material welfare of the individual, many planning documents refer to the farming household or family, rather than the farmer, or use the terms interchangeably.

Most rural households in the OCP areas are best conceived as overlapping units of production and consumption. Household members collaborate in the production process, but also engage in earning activities (including production) of their own, for real income that they as individuals control in whole or in part. These private sources of income include crop and livestock production, gathering forest and bush products, trade, wage labor, and artisanal activities. There are almost always different expectations for the expenditure of private versus collectively produced household income. When we talk about household goals, we are talking about a dynamic balance of these private and collective production, earning, and consumption goals.

In West Africa households tend to be aggregated in relatively large (in comparison to East and Southern Africa) compounds under the authority of a single male. Such compounds are often both polygynous and extended. In polygynous compounds or households, the fundamental unit tends to be a wife and her children. The wife is often in competition with her co-wives for the

assistance and wealth of the husband, and—as throughout Africa—her primary loyalties are to her children as opposed to the household or compound. The labor migration of sons and other dependents tends to lessen their dependence on the authority of the household head. Whether aggregated into compounds or not, households are dynamic, complex social units characterized by both cooperation and conflict.

Diversity in the Organization of Household Economic Activities and Land Use Patterns

The case studies reveal the wide range of diversity among countries in household social organization, land use patterns, patterns of production, goals, and constraints. Even within the same site in the same country there is typically a wide difference between indigenous and immigrant populations. Within groups that can be broadly defined as “indigenous” or “immigrant” at a particular site, we also saw wide variation.

One source of variation was cultural patterning of economic roles and relations within the household. One ethnic group might, for example, have a strong cultural tradition of women’s participation in trade as well as in collective and private crop production. Another immigrant ethnic group might have a pattern of women’s participation in home-lot gardening and trade, but not in either farming or collective crop or livestock herding activities that provide the main source of family food. Ethnicity was also associated with different levels of interest in trade and livestock versus cropping systems—patterns that were reflected in the deployment of family labor and income. Crop production technology and the use of certain soil conservation measures (dikes, rotations) also varied among ethnic groups.

Cultural patterns may be subject to change in new settings. Physical distance from the sending area and new economic opportunities in a settlement area may provide a framework for reworking old cultural values and production patterns. In Mali, for example, we observed that many migrant wives were willing to engage in off-farm activities that they would not have undertaken in their home areas. Certain Mossi groups in the AVV planned settlements also appeared to do private cropping much more extensively than in their home areas. Household strategies also differed for different income and wealth categories within ethnic groups.

The Centrality of Diversification within Household Production Systems

One of the most important concepts advocated by the LSR is that of a household production system as opposed to a household farming system or cropping system. This concept shifts our interest from ways of organizing agricultural production per se to ways of organizing opportunities for obtaining real income and alerts us to the range of real income sources that are significant to smallholders in the OCP areas. These sources are on-farm and off-farm and include cropping systems, livestock management, collection of natural produce, trading, artisanal activities, commerce and business, and wage labor. Households in settlement areas throughout the tropics seek to diversify sources of income for a number of reasons. At the level of the farming system, it creates “more resilient, ecologically stable (and hence more resistant to pests and diseases) and productive farm enterprises. It also makes better use of family labor throughout the annual cycle, improves the nutritional level of farm families, . . . and provides a wider range of foodstuffs and agricultural commodities for nonfarm families and agrounderprises” (Scudder and Wimaladharmas 1985).

Within the larger production system, incorporation of off-farm income sources provides a greater degree of security in risky environments, and—especially important throughout the OCP areas—is essential for retaining the commitment of household members, particularly wives and members of the second generation. Diversification at the community level increases opportunities for exchange (as between hosts, settlers, and pastoralists) and for market development. It follows, therefore, that diversification is a prerequisite for achieving spread effects. When policymakers plan and implement programs of new land settlement as single-crop agricultural production schemes, the goals of planners fundamentally contradict the goals of settlers. In emphasizing settlers as the most important single resource in successful settlement, the LSR argues that the development of OCP areas must be based on diversified systems of production at household and community levels.

Settler households practice two types of diversification that combine on- and off-farm opportunities. One, characterizing the poorest households, is for survival purposes, the farming system alone being unable to support household members. The other characterizes settler households as they

move beyond subsistence. It entails the involvement of settler households in a broader range of off-farm activities (Scudder 1986). The challenge for planners is to assist settler and host populations in creating opportunities for stimulating this second type of diversification, which IDA emphasizes throughout the rest of this report.

The propensity of settler households to diversify economic activities as incomes rise probably characterizes households throughout rural Africa. An example of this pattern has been described by Reardon, Delgado, and Matlon (1992) in Burkina Faso. Their analysis of income data from four rainfed harvest years (1981/82 to 1984/85) not only shows the importance of diversification for the poorest and richest thirds of their sample, but also shows that the importance of off-farm activities increases with wealth. Furthermore, "local nonfarm activities. . . are most important in the zone with the best agriculture—the Guinean zone" where such activities as food processing, cottage industry, and commerce constitute 38 percent of income. "These activities are closely tied to local agriculture. This substantially boosts the income of women relative to those in other zones" (1992 p. 4), hence demonstrating the potential for what Mellor and Johnston call "intersectoral growth linkages" (1984).

Early discussions of development in the OCP areas often emphasize the potential of these areas for crop production. In Burkina Faso, the government focused on the potential amount of "supplemental" food grain that could be produced in the OCP areas and the role this could play in offsetting potential grain deficits. Similarly, governments anticipated that the successful control of river blindness could bring about opportunities for cash and subsistence crop production for impoverished farmers from the densely settled Dogon, Kabye, and Fra-fra areas of Mali, Togo, and Ghana, respectively. Planners in Togo look at the Mo Plain as another breadbasket area.

Most case-study farmers interviewed did indicate a desire for new and better land as the reason for settling in OCP areas. They were looking for more than simply new land, however. They were looking to improve their livelihoods, and doing so required them to diversify. Settlers and indigenous farmers in the OCP areas of Burkina Faso often cited their desire to adopt new crop production technologies that would allow them to raise their incomes. More frequently, however, they indicated that their most immediate concern for the

future was diversification into noncrop production activities—notably livestock, small-scale commercial activities, and wage labor.

This response pattern was reflected in other areas. Higher rates of immigration were typical in areas with proximity to one or more of the following: administrative center, opportunities for dry-season irrigated farming, areas of successful commercial rainfed production. Some areas of successful rainfed production were associated with crop extension packages (Solenzo, Dioila, AVV); others were not (Mo Plain). The highest rates of spontaneous settlement tended to be in areas of opportunity for both cash crop production and other commercial activities.

Agricultural immigrants in all areas initially are concerned with reinstating their basic food systems at preexisting or higher levels. Their production systems are generally quite extensive, with emphasis on planting the largest area possible in basic food grains. Once subsistence is ensured, settlers become involved in a wider range of income-producing activities. The first of these was often livestock. In every case of successful settlement in the drier northern zones (Mali, Burkina), we observed a fairly immediate and direct increase in livestock ownership and herd size, with consequent growing competition for pasture between immigrant and indigenous farmers, and between farmers and pastoralists. The exceptions to this were in northern Ghana and in Mali, where Dogon settlers were moving into established communities that would not allow them to come if they had large herds. On-farm livestock ownership was also constricted for settlers living in villages next to dam projects (Kompienga, Selingue).

In the absence of a fundamental change in the national banking systems of the OCP countries, livestock is likely to remain a principal investment for migrants and indigenous farmers in the more northern OCP areas. For pastoralist populations, livestock is the principal source of income and (whether exchanged for grain or used for meat and milk) food. The manure that livestock provides figures in any long-term strategy to develop sustainable cropping systems. Small livestock are also a source of income and investment for women at some of the sites.

Despite the multiple benefits, livestock production in the OCP areas remains risky for agriculturalists and increasingly difficult for pastoralists. Many OCP areas are isolated from needed

veterinary assistance. Small- and large-animal livestock diseases have been rampant at many of the study sites (e.g., Mo Plain, Togo). In some of the OCP areas near major cities (AVV in Burkina Faso), theft of livestock has emerged as a major problem. As population densities increase—in areas near developing cities or irrigated perimeters, for example—the demand for and profitability of livestock may increase, but here again, the social costs of livestock production may also increase. As livestock densities increase, so does the potential for conflict with agriculturalists. While all of these factors limit opportunities for further increases in income from livestock production in the majority of OCP countries, zoning through land use associations for agropastoralism and pastoralism can intensify livestock management and integrate it with cropping systems.

Settlers often perceive noncropping activities as holding the greatest possibilities for increased income over the longer term. Despite the tendency to associate nonfarm activities with cities, in Africa and Asia over half of such activities continue to be in rural areas. With rising disposable income “devoted to manufactured and processed commodities” (Johnston and Kilby 1975: 301), employment opportunities increase. While the above quote refers to rural households in general, one of the more interesting findings of IDA’s global evaluation of land settlement was that worldwide, settlers make similar purchases as incomes rise (Scudder 1981). These include improved housing, a predictable range of household furnishings; locally brewed beer and other beverages and food products; animal drawn plows and carts as well as agricultural inputs; and bicycles and sewing machines.

Development plans should facilitate provision of such items at the appropriate time: many of them can be locally produced and/or serviced. Improved housing makes use of local materials (bricks, cinder blocks, and timber), while construction and household furnishings provide employment for local artisans who can also service and repair plows, bicycles, and other simple equipment. Plans should also consider appropriate small-scale agroindustries that utilize local produce. More research is necessary, however, to identify appropriate agroindustries as well as to provide recommendations on their scale and financing. As with other recommendations in this report, the starting point should be processing activities people already do, such as village and

market brewing, which can redistribute income from men to women.

Diversification of farm and nonfarm activities further increases opportunities for employment (with periodic wage labor especially important for recent arrivals and the poorer households) and trade. Trade can provide income and status to women in settlement households. Men are also employed as traders, with the more successful traders often starting small commercial businesses. In Burkina, grain merchants operating with working capital (estimated at 500,000-1,000,000 CFA for larger traders), could easily earn average monthly net profits of 30,000-50,000 CFA in addition to earnings from crop enterprises. This amount approximates the monthly pay of lower-level civil servants. One successful young merchant was earning a monthly net income of about 50,000 CFA. The average net income from one AVV settler’s store was 300,000 to 350,000 CFA per year.

Only a small number of the sample farmers were engaged in the more lucrative year-round off-farm activities. Most farmers’ off-farm activities consisted of small-scale commercial enterprises: sales of consumer goods and food products, production and marketing of foodstuffs (beer, food), and local and nonlocal agricultural and nonagricultural wage labor. These small-scale commercial and wage labor activities were more important for women, married sons and brothers, and for unmarried male and female children attached to households than for male household heads. About half of the average independent income for women in the more diversified AVV planned settlements at Linoghin (near a major market) and Mogtedo (near gold panning sites) was from noncrop activities.

Links between Diversification and Sustainability

We have argued that an increasing diversity of income sources, including off-farm opportunities, contributes to the development of sustainable cropping systems. Preliminary analysis of data from Burkina Faso supports this thesis. Diversification of income-earning opportunities helps with retaining family labor, which is particularly important for poorer and smaller settler households that cannot afford to hire wage labor. We found a strong tie between the development of alternative sources of income for young men

and married women within households, and their willingness to participate in collective production (for consumption and sale) during rainy season months. Household heads know, for example, that without successful noncrop activities that yield individual income, young unmarried and married men are apt to leave, seeking jobs in the cities or coastal plantations. Losing a son to foreign wage labor means losing a valuable labor resource.

Findings from research elsewhere in Sahelian West Africa also emphasize the connection between a diversity of income-earning opportunities and sustainable production (Reardon and Islam 1989; Reardon, Matlon and Delgado 1988). Evidence from the more successful settlement areas in Eastern Africa (e.g., Mwea in Kenya; Gezira and New Halfa in Sudan), shows that diversification does not necessarily occur at the expense of agricultural production. Furthermore, as contract farming of green beans at Mwea, and the integration of livestock and new crops into the farming system at Gezira and New Halfa show, settlers are willing to invest in higher value crops if they have access to good prices and to local, regional, national, and international market networks. In tropical Asia, one of the most successful settlements is Minneriya in the dry zone of Sri Lanka. Following up on a benchmark study done ten years earlier, Wimaladharma found in the early 1980s that over 90 percent of the scheme's initial holdings were still controlled by the same settler families, including second generation members who took over management from their parents (communication to IDA). High rates of settler turnover, as occur throughout the tropical lowlands of Latin American, are associated with lack of opportunities as well as insecure tenure and unfavorable national policies.

Without profitable sources of noncrop income, women must rely on production from individual fields, but conditions in settlement areas can affect their ability to farm individually and to engage in other economic activities. The case studies in Mali and Togo show that when women settled in more isolated OCP areas, their opportunities for farming individual plots were dramatically reduced. Dogon women who settled at Yanfolila, Mali, for example, did not have access to individual garden plots as had long been the practice in their home area. Women's access to individual plots was similarly constrained among settler households in Finkolo and Dioila (Mali) and the Mo Plain (Togo). Priority in settlement

areas is often given to production in household fields that are invariably managed by male household heads. Women's need for private income sources, however, do not change, nor are they offset by any reported changes in the distribution of resources within the family, such as household heads making cash or in-kind payments to women.

The clearing of bush areas in settlement zones may also hinder women's access to another source of income: collecting and processing fruit such as shea nuts. These new constraints on women's sources of real income occasionally lead to income generating activities having potentially negative consequences for sustainable production. Poorer women in Mali (Yanfolila), for example, were obliged to rely heavily on fuelwood sales as an income source, thus contributing to deforestation in the area. As Koenig (1990a) notes, it is the poorest women who are squeezed into environmentally damaging strategies to earn income.

The development of a diversified production system which is not solely based on agriculture, much less on a single cash crop such as cotton, increases the income-earning potential of families by allowing them to spread activities into the dry-season months, enables them to spread risks rather than depending too much on any one source of income, and enhances the chances that smaller households in particular, which may be short of labor for large-scale cash cropping, will be able to increase their income and improve family welfare. Finally, it increases the chances that households will contribute their labor and financial resources to the development of more sustainable cropping systems.

Clearly the linkage between diversification and sustainability deserves further attention by researchers because of its importance for efforts to plan settlement assistance and promote sustainable agricultural development in OCP areas. We need more specific research on the nature of the linkage under varying conditions. The relationship may be weakest, for example, in high-risk areas for agriculture, where rainfall is lower, as is frequently the case in the sending areas north of OCP areas in the Sahelian states (Reardon and Islam 1989; cf. Painter 1985:457-476; 1987c).

The Role of Women in Diversification Strategies

In emphasizing the household as the critical production unit throughout this report, attention has

been directed at all household members including women, children and other dependents. Since diversification can provide a separate cash income to women, it can increase their status as productive members of the household while retaining their commitment and labor for more sustainable household economies (Gladwin and McMillan 1988).

To increase opportunities for women, special attention must be paid to a number of constraints. At the household level, diversification strategies and investment of income realized should enable women to reallocate more of their labor from such time-consuming activities as food preparation, collection of wood and water, and child care to more productive activities such as household gardening, raising of livestock, cottage industries, and trade. Time required for food preparation can be greatly reduced through access to mills for grinding cereals, or in their absence, to hand grinders (Carr and Sandhu 1987). Use of more efficient stoves, agroforestry (Cook and Grut 1989), and planting of household and community woodlots, and community protection of classified forests, will not only contribute to environmental enhancement, but also release women from the arduous task of collecting fuel at increasing distances. Inadequate supplies of potable water constrain women's involvement in more productive activities in two ways. One is the time spent in hauling water from distant sources. The other is the increased time spent on child care due to water borne diseases associated with water sources throughout the OCP countries.

Cultural biases at all levels against productive activities by more independent women must also be addressed. A common finding of studies of government sponsored settlement projects, for example, is that the productivity and status of settler women tends to fall below that of women remaining in the sending area. Planners are largely to blame. They seldom interview wives when selecting prospective settlers for sponsored settlement, with the result that households may be picked in which the wife is a reluctant pioneer, while others are rejected in which the wife could have contributed much positive support. Furthermore, development strategies—often based on a single crop—are aimed at the male head of household, with little or no provision for the economic activities of wives (Basset 1990; Staudt 1987; Lieberherr-Gardiol 1989:312-313; McMillan 1983, 1987b, 1989). Women's status suffers as a result,

their role becoming more that of a laborer in fields managed by the household head than that of a co-producer. Yet another constraint is that extension agents, usually male, direct their advice at males. All of these constraints reduce the potential of settlement by restricting the access of women to more economically productive activities.

Increasing Differentiation within Settlement Populations over Time

The observed differences in strategies adopted by wealthier and poorer households have planning implications. Studies of older settlements in Mali, Burkina, and Togo (Dioila, Solenzo and AVV, FED-Agbassa, respectively), show that if an extension package is successful in galvanizing high rates of income growth from crop production during the first phase of settlement, it creates groups of settlers with loftier production goals. If "captured" by new technology and opportunities for investment, these settlers can become a driving force behind income-producing investments and activities. If not captured, this same energy will be turned toward maximum exploitation of the extensive cultivation options available to them.

The AVV planned settlements at Mogtedo and Mogtedo-Bombore would have been even more successful had the project managed to harness the energy of the first generation of very successful farmers (who, because of their earning levels, are often described by AVV extension agents as "millionaires") for the promotion of intensive sustainable cropping systems. Since the settlers were unwilling to incur the wrath of the extension service by gross violations of the prescribed cultivation bands, and since opportunities for further income growth through investment in new crop production technology (tractors, irrigation) were limited, some of the wealthier settlers migrated away from crop-production areas to areas with more income-generating potential.

In contrast, at Solenzo in Burkina and Dioila in Mali, the existence of a profitable cropping package plus more flexible land tenure arrangements (which allowed both settlers and hosts to increase dramatically their cropping areas with new animal traction and tractor technology), enabled the first generation of successful cotton producers to satisfy their desire for incremental increases in income growth through crop production. We can predict, however, that as spontaneous immigration to the Solenzo and Dioila cotton areas

increases, there will be fewer opportunities for the dramatic increases in crop income that were observed in the past. Settlers will be forced either to intensify their production systems or move on to less densely settled areas. Given the ease with which new land can still be acquired in many areas of the OCP river basins, we can predict that a major factor that will encourage them to intensify existing production systems, rather than moving on to clear other lands, will be their perceptions of the long-term opportunities for more diversified off-farm production in a region.

Gold Mining in Relation to Diversification

A little-studied phenomenon in the OCP countries is gold mining by small-scale prospectors, some of whom are settlers. Hunting Technical Services (1988) refer to such mining in Guinea, Guinea-Bissau and in Niger's Say region. Dames & Moore (1989) refer to sluicing and panning for gold along the Falame in both Mali and Senegal. IDA found hundreds of small-scale prospectors living in a mining camp in Burkina's AVV-UP1, as well as hundreds of other miners resident in adjacent indigenous and AVV villages. Panning for gold has become an important nonfarm revenue source in certain villages. A special study we conducted on gold miners' use of their income showed that a high percentage of it tended to be spent on consumer products and food. This

increased local demand for meat, water, and foodstuffs. Other conditions being favorable, this increased demand would presumably have a favorable impact on diversification. In fact, however, it appears that the settlers living in the adjacent AVV planned settlements are not benefiting from the wider spread effects of gold panning in the region, in large part because of their long history of difficult relations with the indigenous inhabitants in the neighboring regional market and administrative center at Mogtiedo from which most of the merchants supplying the miners are coming.

Seriously pitting arable lands in some locales, placer mining—like charcoal making—can have adverse environmental consequences. On the other hand, it would be a mistake to condemn such mining out of hand. Like spontaneous settlement (which not too long ago was itself condemned by many planners), it is difficult to stop. It also provides an important source of income to participants, some of which we know to be important for providing food security for poor households, and some of which undoubtedly is invested in farm and other nonfarm activities. The role and impacts of such mining needs to be carefully studied in order to develop appropriate management techniques. Once better understood, one management approach might be to zone specific areas for placer mining.

8

Farming Systems

Lessons Learned

Introduction

A major purpose of the LSR is to take a new look at strategies for land settlement in the eleven OCP countries and throughout the tropics. One outcome of this effort has been to isolate what we have called "prerequisites for success." So far in this report, we have emphasized the initiative of settlers, the involvement of hosts and pastoralists, sites of moderate potential that are not too isolated, diversification of the production system, appropriate national policies, and security of tenure. In this section special emphasis is placed on the farming system, both because it is the core around which settlers try to develop diversified economic activities and because planners and technicians have concentrated on the farming system, and especially on the cropping system.

Given a national policy context more favorable toward agriculture and rural development in general, IDA recommends rainfed as opposed to irrigation-based land settlement. First, we believe that assisted spontaneous settlement, which is most often linked with rainfed agriculture, has a much greater development potential than sponsored settlement that emphasizes irrigation schemes. Second, the costs of irrigation projects have been escalating throughout Africa, per hectare costs rarely dropping below \$10,000 and occasionally exceeding \$20,000. Even with double cropping of high-value crops, it is not possible to pay off such capital development costs; indeed,

frequently irrigation projects in Africa do not even cover recurrent costs. Furthermore, at such costs irrigation as opposed to rainfed agriculture will be able to benefit only a small minority of rural residents. While individual households within that minority may be better off than before joining such schemes, many remain poor. In sum, in terms of financial costs and economic returns it is hard to justify a major investment in irrigated settlement schemes (Moris 1987; Moris and Thom 1987).

This recommendation, however, should not preclude the inclusion of small pumps and—as within the Middle Senegal River Basin—small irrigated perimeters within broader farming systems in which households combine small irrigated plots (less than one hectare) with rainfed cultivation. Nor should this recommendation preclude the incorporation and improvement of flood-water, swamp, and *bas fonds* irrigation within broader farming systems. Furthermore, where dams such as Kompienga in Burkina Faso and Selingue in Mali are built for hydropower production, it is wise policy to consider a wider range of options, including gravity flow irrigation, controlled reservoir drawdown, and down-river flooding for the benefit of floodwater cultivators, herders, and fishers (Scudder 1991). As previously mentioned, such dams also provide the opportunity for combining a small core of sponsored settlers with a larger number of hosts, spontaneous settlers, and pastoralists, with the construction township subsequently becoming a regional service center.

Most settlement schemes have been designed and implemented to promote agricultural development, but ironically they have not been very successful in delivering well-designed agricultural systems. Poorly designed farming systems were frequently observed in surveys financed in the 1980s by United States Agency for International Development (USAID) and the World Bank of nearly 150 settlement schemes (Scudder 1981; World Bank 1985). One reason was inadequate and inappropriate research. In the OCP countries, for example, efforts to breed improved cultivars placed too much emphasis on HYV that required improved water management and fertilization applications beyond the capacities of most farmers. As a result, World Bank-funded projects were unable to produce new varieties of sorghum, millet, and cowpeas that could outperform local varieties under on-farm conditions (Carr 1989).

Worldwide, the evaluation of settlements by the World Bank (1985) rated the extension component as poor in 41 percent of the Bank-assisted projects for which information was available in spite of extension's importance as a link between planning and implementing improved farming systems in the OCP areas. Weaknesses have characterized extension programs as a whole throughout sub-Saharan Africa. A generation of large, capital-intensive agricultural development projects was financed in West Africa beginning in the early 1970s to increase agricultural productivity. Most of these costly projects have been terminated, their impact very frequently judged unsatisfactory. A principal reason for this failure is that the extension packages were not responsive to local constraints and opportunities as perceived and factored into smallholders' decision making.

With the exception of cotton, which of all crops has benefited most from government support systems throughout the OCP countries, changes in production systems have been small. Typically, production systems continue to be based on extensive cultivation, depend overwhelmingly on human labor, and incorporate low levels of purchased inputs. Many farmers use technical packages piecemeal, in response to a bewildering array of local factors (see Chapter 5). The result has been increasing agricultural production in the OCP countries that relies on expansion of cultivated areas rather than a transition to more intensive production.

We have argued that the persistence of low-investment, extensive agriculture in the OCP areas

Table 8.1 Extension Agent/Farmer Ratios in Case-Study Countries

Country	Extension Agent/Farmer Ratios	
Burkina Faso	National	1:627
	High (Bougouriba)	1:350
	Low (Yatenga)	1:1000
	AVV Sponsored Settlements (1989)	1:100-200
Ghana	National	1:5000
	Upper East-Global 2000	1:50
	Red Volta Valley and Fumbisi/"Overseas"	None
	Damongo-Frafra/Konkomba	1:380
	Damongo-Multiethnic Tono Project	None 1:148
Mali	National	No data
	DRA Areas	1:330
	ODIPAC Areas	1:380
	OHV Areas	1:92
	CMDT Areas	1:77
Togo	National	1:195-225
	Projet FED-Agbassa	1:59
	Mo Plain	1:159-198

can be explained in part by a lack of government support for risk taking and investment by farmers in agriculture with a view toward longer-term, sustainable production. Government policies on producer prices and terms of access to production inputs have offered little support for growing non-export crops. Persistent weakness in the extension services is another important reason for the lack of change in production systems. The quantity of agricultural extension services, as indicated by the ratio between extension workers and farmers, however, may not be the problem. Suggested ratios for West Africa are 1 agent to 1,000 farmers in areas of rainfed agriculture, and 1:100 in irrigated areas.

Some idea of the actual availability of extension agents is given in Table 8.1, with information drawn from World Bank documents and the case studies. The figures suggest that, aside from Ghana, agent/farmer ratios may be unnecessarily high in the case-study countries. Of course, the ratios may mask the actual distribution of agents; more importantly, their accessibility and effectiveness are in question, whatever the comparison between the theoretical and actual ratios.

As we have suggested above, and as is supported by findings from the case studies and documents reviewed during the LSR, the weaknesses appear to reside in the capacity of government extension agencies to translate presence into effective work. Among the factors explaining the generally poor performance of extension services in OCP areas (outside cotton-growing zones) are: poor morale, poor pay and lack of back-up support, inappropriate and at times conflicting extension messages, poorly qualified extension staff, poor relations between extension agents and farmers, and neglect of agricultural areas outside project zones. Extension services have been underfunded in the OCP countries, and much of available funding (as much as 90 percent in some cases) is budgeted to staff salaries, leaving little or nothing for operations: vehicle purchases, maintenance and repairs, or fuel.

The prerequisites for success that have been identified have major policy implications. If agronomists, livestock specialists, and agricultural economists do not pay close attention to these in research and design activities, settlers will reject or only partially accept systems that, though technically feasible and sustainable, meet neither their needs nor their expectations. In the next section the nature of settler farming systems is outlined. In the subsequent section on How to Proceed, suggestions are made for achieving higher yields in an environmentally sustainable fashion. Given the extensive nature of current farming systems, where settlers attempt to increase yields per unit of labor as opposed to per unit of land, the task will not be easy.

The Nature of Settler Farming Systems

OCP-area settlers, be they spontaneous or sponsored, usually organize agricultural production in new lands on the basis of extensive land use. Settlers perceive land, particularly land outside settlement schemes (e.g., the AVV, Burkina Faso; Tono Irrigation Scheme, Ghana; and FED-Agbassa, Togo) as plentiful, and they use it accordingly.

While the size of their holdings may cluster around national or regional averages, most settlers clearly opt for increasing the size of areas under cultivation, hence increasing labor productivity. These land-absorptive production systems rely overwhelmingly on manual labor on fields managed by household heads. The first source of labor is the settler household itself, although

large amounts of extrahousehold labor (both wage and sharecrop and, to a lesser extent, non-wage collective) may be incorporated. Not surprisingly, the evidence suggests that larger households, whether older residents or new arrivals with ample domestic labor supplies, are more successful than smaller households during the early years of settlement.

Exceptions to the extremely heavy reliance on manual labor are most likely to occur in sponsored settlement schemes (Ghana, Burkina Faso, Togo), which introduce improved production techniques, and where rates of animal traction use may be significant. In other cases of sponsored settlement (e.g., in Ghana's "Overseas"), settlers may use both animal traction and tractors. Spontaneous settlers also use animal traction where soil conditions and low animal health risks make the technique attractive (Dioila, Mali), and in some cases may use small tractors (Solenzo, Burkina Faso). In all such cases, however, the intention appears to be more to increase yields per unit of labor than per unit of land, with ox plows and tractors used to farm larger per household hectares. Stated differently, ox plows and tractors are used to farm larger hectares per capita in an extensive fashion rather than to intensify production. Furthermore, even in areas where plows are frequently used, significant numbers of settler households rely on manual labor for production. At FED-Agbassa settlement project, Togo, for example, where the government has been promoting animal traction for years, 43 percent of 30 households in the IDA sample relied on manual labor for cultivation. In general, settler households that rely on animal or mechanical traction for agricultural production account for a small percentage of those included in the case studies. For the Sahelian countries as a whole, only 10 to 15 percent of arable land is estimated as cultivated by animal traction (Jayne, Day and Dregne 1989).

Another feature of settler production systems observed in the case studies, particularly in areas of spontaneous settlement, is the low level of chemical fertilizer use on staple food crops, while relatively more fertilizer is applied to such cash crops as cotton. Instead, settlers cultivate fields with a variety of crop rotations until they perceive declining yields or notice bothersome weeds or a proliferation of parasitic plants, *Striga*, at which time they leave the field in fallow for periods of five years or more. It takes three to five years to move from first cultivation to signs of a

significant decline in soil fertility. Most households cultivate several fields each year, each with a different history, so new fields are cleared annually. The cumulative result is rapid growth of areas under cultivation or in fallow, and a continuing decline of bush land.

Settlers may state that there is no reason to invest in expensive chemical fertilizers when land is so plentiful. Indeed, bush fallows provide an effective means of restoring soil fertility. The system works as long as resources remain plentiful, but a number of OCP areas are undergoing rapid settlement. Given the finite nature of land resources, continued use of the extensive option by growing numbers of settlement area populations is bound to (and in some cases already has) encounter constraints. Of interest is a continuing, and apparently widespread, perception among both host and settler populations in some areas (Mo Plain, Togo) that land is plentiful, when in fact increasing pressure on land is already apparent.

Use of fertilizer is apt to be higher on sponsored settlement schemes (FED-Agbassa, Togo, and AVV, Burkina Faso, but not in Damongo, Ghana) and in areas where returns are high on cash crops (Dioila in Mali, Solenzo in Burkina Faso). On the schemes, however, relatively high use of fertilizers is no guarantee against declining soil fertility. Typically, settlers' holdings are designed to be partially cultivated each year. The remainder of the parcel is to be left in fallow or planted in forage crops for traction animals. The combination of fertilizer use and periodic fallows is expected to provide the settlers with continuing access to good soils within their allotted holdings.

In Togo (FED-Agbassa) and Burkina Faso (AVV-UP1) settlers practice extensive cultivation on their parcels. Animal traction increased labor productivity considerably and made it possible to cultivate most if not all of their plots every year, while using fertilizers with limited recourse (AVV and FED-Agbassa) to the recommended system of fallows. The result is a source of some concern to government workers on the schemes and settlers: relatively high levels of fertilizer and increasing signs of, and complaints about, declining soil fertility. In all areas covered by the case studies, settlers have initially used extensive cultivation and experienced declining soil fertility after the first few years. Rather than moving toward more intensive cultivation, many shift their field sites or move to other areas (e.g., the AVV, Burkina Faso; the Mo Plain, Togo). Some intensification,

however, has occurred. In Dioila (Mali), for example, spontaneous settlers have intensified through the use of both fertilizer and manure; they confine livestock to facilitate manure collection.

How to Proceed

1. Implementation of suitable farming systems depends on a background of appropriate prerequisites.

Discussion: Relevant prerequisites apply to both land tenure and land usage. Under tenure, we have emphasized the importance of security of tenure. Under land use, we have emphasized the initiative of settlers, production system diversification, the involvement of hosts and pastoralists, sites of moderate potential that are not too isolated, and appropriate national policies. These prerequisites, along with the issue of environmental sustainability, dealt with in Chapter 11, should be kept in mind during the following discussion of more specific components of the farming system.

2. The starting point for development of suitable farming systems should be existing systems of land use.

Discussion: Continuing research is producing more and more evidence of the adaptability of existing cropping systems to high-risk sudano-sahelian environments. According to Carr, of 3,000 millet entries screened by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), "none proved superior under farmer conditions" (1989:57). Over the centuries farmers have developed their own varieties and species to deal with local conditions. Besides species of millet, they have developed cow peas that provide not just beans but also leaves for vegetable relishes and animal fodder. Long maturing varieties of sorghum make "good use of limited mineral availability" (ibid:49), while planting of five or more seeds per hole provides the energy for cracking open "seriously panned soils" (ibid:53). Intercropping tends to reduce labor bottlenecks at critical points in the cultivation cycle, while reducing the risks associated with monocropping (Lyman, Sanders and Mason 1986). Local systems of land use also have their problems—problems unlikely to be solved in the absence of appropriate farm-household incentives and extension of new technologies that have been carefully researched under on-farm conditions.

3. Implementation of suitable farming systems requires further research as well as a broader and more unified extension approach.

Discussion: Such international research institutes as the International Institute of Tropical Agriculture (IITA) and ICRISAT are already changing breeding programs to produce crop varieties that are more suitable under on-farm conditions. In particular, more emphasis is being placed on hardier, more drought- and disease-resistant, early-maturing varieties. Incorporation of these into technological packages will require the collaboration not only of agricultural and social scientists, but also of national research institutions and local farmers (through adaptive farming systems research and on-farm trials). Because settler households try to diversify cropping systems and integrate livestock and crops, a major weakness in the Sahelian countries has been that extension services often are tied to particular crops (the CMDT in Mali is a notable exception to this policy), or to a particular sector, with the result that settlers are given conflicting advice. Hence the need to unify and broaden extension services. Research and extension should also be better integrated and should combine on-farm research and demonstration with careful monitoring of results.

4. Given the nature of diversification goals, farming systems must integrate cropping systems with livestock.

Discussion: While the cropping system is the essential starting point for building diversified production at the household level, once food security is achieved, investments in livestock can be forecast. A major advantage of assisted settlement over sponsored settlement is that it is easier to integrate crops and livestock; nonetheless—as previously outlined—increase in livestock numbers tends to result in conflict. This happens irrespective of whether the owners are hosts, settlers, or pastoralists. While such conflicts are not easy to solve, a key to their resolution is to incorporate the different interest groups into local organizations for land management and other planning purposes.

5. Given the coexistence of hosts, settlers, and pastoralists in most OCP areas (the major exception being in areas heavily infested with the tsetse carriers of animal sleeping sickness), the zoning approach to land use planning in catchment basins and other areas is recommended (Chapter 9).

Discussion: A drawback of this recommendation is that experimental zoning—whereby government agencies and NGOs help community members allocate areas for village sites, home gardens, fields, livestock management, collection of forest products, and reserves—is an approach that is just starting up in several OCP countries. Nonetheless, if settlement-area residents can agree on a land use management plan, such zoning has major advantages. At the level of community or catchment-area production systems, it is apt to reduce conflicts among farmers by allowing them to herd out their stock for management by pastoralists in pastoral zones during the cropping season, and—for manuring—in fields following the harvest.

Zoning also encourages such synergisms between farmers and pastoralists as exchange of foodstuffs for meat and dairy products, and provision of oxen for plowing. It has the added advantage of allowing those pastoralists who wish (and in each of our Burkinabe field sites we found such pastoralists), to move toward agropastoralism.

6. While agronomists and agricultural economists have yet to develop appropriate farming systems for savanna habitats such as exist in OCP areas, it is clear that technical packages will have to include a number of components.

Discussion: Granted the emphasis, at least initially, of spontaneous settlers on food security, and the importance of food security to hosts and pastoralists as well, it is unreasonable to expect farmers to adopt new technologies—no matter how suitable—without appropriate incentives in the form of prices, rural finance, and marketing facilities. In the absence of an appropriate package, certain practices nonetheless warrant emphasis at this time. Not listed in any order of priority, these are briefly discussed below.

- Improved use of farmland through such water retention techniques as contour ridges, stone bunds and/or vetiver and other grasses on sloping lands, and tied ridges on less sandy flat lands.

Discussion: Though labor intensive, contour ridges and dikes, unlike tied ridges, can be built during the dry season, hence evening out labor requirements (Deuson and Sanders 1990). The cost effectiveness of such techniques (and the willingness of farmers to incorporate them) has been shown throughout the Savanna woodlands of Africa, including Machakos District in Kenya and the Mossi Plateau in Burkina Faso. Such

techniques to protect arable land and to increase yields through improved water retention are best extended through the type of community land management associations described in Chapter 11.

- Increased emphasis on the type of farm activities that women in the OCP countries have developed on their own initiative, including home gardens and the rearing of small ruminants.

Discussion: In terms of sustainability the two activities go together, the manure enhancing the fertility of home gardens. Settlement area planners tend to ignore women's gardens in spite of their development in a number of areas of high population density throughout Africa, and their use throughout Asia. Not only do the gardens provide improved nutrition for the family, they can also provide some income. Because of their small size and proximity to villages, they are far more easily fertilized with compost and animal wastes than are fields where requirements for tons of refuse make manuring impractical except for grazing livestock on fodder after harvests.

- Cash crops, crop rotation, and use of fertilizers.

Discussion: As with settlement programs elsewhere in tropical Africa, the case studies include many examples of farmers willing to rotate crops and use fertilizer. In both Burkina Faso and Mali one of the most effective rotations has been fertilized cotton followed by a cereal crop that receives some residual benefit from the fertilizer. On the other hand, more complicated rotations have had very little success in West Africa and elsewhere, especially ones that are combined with a green manure crop.

In recommending cash crops, planners have tended to forget that food crops can also be cash crops (Little and Horowitz 1987). Given the initial emphasis that settler households place on food security, it makes sense to emphasize from the start cereal, yam, or other staple production for both consumption and sale. While cotton has proved to be a successful crop in higher rainfall areas, it has been less successful where rainfall falls below 800 mm. These areas need more research on such crops as various legumes and sesame, which can be combined in more sustainable farming systems and provide produce for local consumption and sale.

Though recommended in combination with water retention techniques as a means to increase by half or double cereal yields in the more arid OCP areas (Deuson and Sanders 1990), use of fertilizer presents a difficult problem. The case

studies include numerous examples where farmers are willing to use fertilizer, especially on higher-value crops like cotton—e.g., in Dioila, Mali; Solenzo, Burkina Faso; and FED-Agbassa, Togo. Moreover in Ghana, Akwabi-Ameyaw believes that most if not all farmers would use fertilizer if it were available and if they could afford it. The problem is that “the greater majority of those who use it do not follow extension recommendations for effective application. They spread a given quantity thinly over a wider farm area apparently in the belief that ‘a little is better than nothing’” (personal communication, April 1990).

While inadequate knowledge can be addressed through functional literacy programs and improved extension, to achieve reliable economic returns from fertilizer in OCP areas, fertilizer use should be part of a single technical package along with improved water retention by means of dikes and similar devices. Improved distribution and lower marketing costs are also essential. Presumably a combination of both government and private-sector initiative is important here; a major risk is that government institutions—under donor pressure—will pull out of distribution and sales before private traders are able to take over.

With the elimination of subsidies, price increases present a more intractable problem (see Chapter 5, especially footnote 1). Even under experimental conditions on research stations, responses “at current undistorted prices... will not give farmers an attractive return on their investment” (Carr 1989:54). If more farmers are to use more fertilizer, price increases for their produce would certainly provide a greater incentive. Delayed payment for fertilizer, or payment in kind after the harvest (as advocated by Global 2000 in Ghana), is another approach. To complement inorganic fertilizers, better use could also be made of West Africa's extensive deposits of rock phosphate. IDA believes that governments in the OCP countries should share with farmers some portion of the costs of sustainable productivity. We agree with Jayne, Day and Dregne, who point out the billions invested by the United States government on a range of subsidized conservation programs since the late 1930s, and who argue also that the current emphasis on structural adjustments at the national level is not adequately addressing impacts on the rural sector or longer-term impacts at the national level in countries where the large majority of the population is still dependent on agriculture (1989:19).

7. Rural finance (including credit), like land tenure, is one of the more difficult policy issues associated with land settlement.

Discussion: In a detailed global assessment of strategies for small-farmer development, an evaluation team from Development Alternatives concluded that such farmers could pay market rates for credit (DAI 1975). While this conclusion may have general validity, it does not apply to either spontaneous or sponsored settlers during the initial years of the settlement process. Spontaneous settlers tend to spend what capital they have during the move and initial settling in; sponsored settlers tend to have little capital to start with.

Some financial assistance is necessary during the settling-in stage if settler households are to utilize a more productive technology to move more rapidly beyond a subsistence mode of production in an environmentally sustainable fashion. Once farmers are initially successful in acquiring new labor-saving technology, their ability to finance additional technological innovations (carts, a second plow, even tractors) tends to increase if other aspects of the production environment are favorable. We base this on our observation that a large amount of the animal traction equipment of the Solenzo farmers in Burkina was purchased with cash. Recurrent costs like fertilizer are a different matter. Here there is little evidence that in the absence of credit settlers will be either willing or able to invest in the new technology.

There are no easy solutions. Perhaps the most imaginative attempt to use both the government and the private banking system to provide seasonal credit to individual settler households is currently under way in Sri Lanka's Accelerated Mahaweli Programme. On paper the experiment looked good. Its execution has not been satisfactory—not because credit was unavailable, but because productivity and income diversification were insufficient to enable settlers to repay their loans. As a result the proportion of households able to take out new seasonal loans has fallen over the years (Scudder and Wimaladharm 1990: Appendix 4). The most successful lending institution has been the only private bank involved—greater success being associated with a more innovative approach carried out by a larger, appropriately trained field staff. One approach has been to provide loans not to individual households but to small water-user associations whose members then are jointly responsible for repayment. In that case repayment has been on

time after each cultivation season, although a similar record characterizes a minority of households to which individual loans have been given.

After ten years of evaluation, one Mahaweli donor (USAID) has come to the conclusion that an initial settling-in grant is required. This expensive option requires serious consideration, only in regard to small sponsored settlements designed to demonstrate new sustainable technologies to a wider population of hosts and spontaneous settlers for whom other sources of financial assistance would be encouraged. One avenue might be credit supplied through community land management associations (Chapter 11), although care must be taken not to overload newly formed associations with too many tasks.

Private banks in Mali, as in Sri Lanka (above) have recently shown evidence of much greater openness toward providing rural credit. This is particularly significant in West Africa, where private banks have not been willing in the past to provide loans to smallholders. Villagers in the area of Mali's *Opération Haute Vallée* (OHV) have formed associations (*associations villageoises*) in order to obtain bank loans. In the past, the principal source of such loans has been the *Banque Nationale de Développement Agricole* (BNDA). Beginning in 1987-1988, some village associations in the OHV zone became increasingly aware of their potential importance as bank clients, and, in fact, made a comparison of the relative efficiency of the BNDA and a private competitor, the *Banque Internationale pour l'Afrique Occidentale au Mali* (BIAO). The BIAO provided the village associations with quicker processing of loan dossiers, and thus obtained business from 20 associations. BIAO loans are used to purchase inputs and for a variety of other purposes identified by the associations, and reimbursement rates have been high. Cases such as this illustrate that smallholders can organize themselves in order to gain access to credit. They also show some encouraging changes on the part of a few private banks.

The village association approach is not a guarantee of success, however. Size and heterogeneity can influence their effectiveness in administering credit or with land management tasks. In general, group success with reimbursement of loans is greater when the number of participants is relatively small and the members of the group relatively homogeneous. While other sources of rural finance include tontines, credit unions, and moneylenders (especially shopkeepers), IDA has

inadequate information on their potential as a source of rural finance. Moneylenders in other parts of the world have taken over land in repayment of debts at the expense of settlers, but the continued importance of customary tenure in the OCP areas and the absence of an active land market reduce that risk. As for sources of household finance, the downturn in the coastal economies has adversely affected remittances, hence making other sources of rural finance still more important for both farm and nonfarm enterprises. What these should be is a major topic for further research.

8. Efforts to promote animal traction should focus on areas of higher potential as part of a comprehensive technology for selected households.

Discussion: Animal traction appeals to planners because of its potential for better land preparation; cultivation of larger areas with reduced labor inputs; integration of hosts, settlers and pastoralists; and possible multiplier effects in small-scale manufacturing and service industries. In the OCP countries, however, there has been a high failure rate among projects that have attempted to introduce animal traction (Jayne, Day, and Dregne 1989). Problems include initial costs and inability of households to finance replacement of stock and equipment, a three-to-five-year period to master the technology (and up to eight years to realize full benefits), uncertain profitability on poorer soils, an inadequate household labor force to make effective use of the technology (in terms of herding requirements and use), displacement of labor bottlenecks from land preparation and planting to weeding, poor condition of stock without supplemental feeding when land preparation needs are greatest, conflicts due to crop destruction, disease coupled with inadequate veterinary services, and theft. All of these problems have plagued settlers, for example, in the AVV's UP1.

Nevertheless, in higher rainfall OCP areas with better soils, where cash crops are less risky, the introduction of animal traction has increased output and income. Major examples from the study sites are Dioila, Mali; Solenzo, Burkina Faso; and FED-Agbassa, Togo. While animal traction in Solenzo, as in most other locales, is associated with an extensive system of land use, intensification in Dioila is under way. According to Koenig, "the farmers

have cattle and equipment and achieve good agricultural yields. They have a shortage of land, but have begun to intensify their cultivation practices, using rotation, manure, and chemical fertilizers. Some have begun to stall-feed animals to allow easier access to manure" (personal communication, March 1990; see also Eicher and Baker 1982).

Notwithstanding the problems, IDA believes that efforts to spread animal traction should continue. Such efforts, however, should focus on OCP areas of higher potential as part of a technology for carefully selected households (perhaps even letting village associations nominate households, as is being tried at some of the study sites) that includes such features as a proven, higher-value cash crop (and cotton is the only one at the moment), improved land management, zoning for cropping and livestock management (Chapter 10), village land management associations (Chapter 11), rural finance, and use of fertilizers.

9. Increased diversification in the areas' population and inhabitants (hosts, settlers, pastoralists) and in their production systems over time require that extension programs be adaptable.

Discussion: If an extension package is successful in achieving relatively high rates of crop-income growth during the first phase of settlement, it creates a group of settlers with greater economic resources and more lofty production goals. Groups who arrive later typically do not have the same access to land as earlier groups. The studies show that extension programs that tested well in other regions may not be adaptable to the particular needs and constraints of inhabitants or of one subgroup of inhabitants at a site. A strong emphasis should therefore be placed on making research and extension programs "iterative" —i.e., to ensure from the start that the results of research and extension feed back into the design of future programs.

One of the most successful extension programs that we studied, the CMDT in Mali, has modified its program significantly since it began in response to the evolving needs and concerns of the population that it serves. CMDT has been at the forefront of a variety of new developments, ranging from village associations to erosion control. This adaptability has made a difference in the ability of the CMDT farmers to intensify their crop and livestock production systems.

9

Importance of Markets and Service/Regional Centers

Why Centers Are Important

Socioeconomic centers are important to successful settlement, most often combining multiple functions. They serve as focal points for commercial exchanges and for providing social services to inhabitants of settlement areas. A viable market is an essential feature of a dynamic socioeconomic center. In some instances markets predate OCP-related settlement, having grown out of earlier organizing attempts or spontaneous exchange activities at important crossroads, or at border or river crossings. In other instances they were created by governments or settlement agencies after the start of OCP operations.

Overview of Markets and Settlement in Case-Study Areas

Market systems both feed and are a product of successful new lands settlement. As settlers reinstate their basic food systems they sell greater quantities of food and other cash crops. As farmers' incomes increase, they buy more services, manufactured goods, and foods. This leads to the development of commercial transactions, particularly at public marketplaces. Some of the clearest evidence we have of income growth in the case-study areas comes from the substantial growth observed in existing markets and the creation of new markets.

The Mo Plain of Togo provides an example of this growth in focused commercial transactions that are fed by settlement, increasing agricultural

production for sale, and increasing disposable incomes among area residents. The Tindjassé market, which was founded in 1980, has experienced strong growth during the period following completion of a bridge over the Mo River and a trunk road in 1983. Forty-three percent of the resident traders surveyed by *Société Togolaise d'Etudes de Développement* (SOTED) in 1985 had come to Tindjassé during the years following this infrastructural development; 46 percent of the traders had settled in the area during the eight-year period from 1974 to 1981. The driving force behind market growth has been a large increase in yam production, principally by settler households, who reportedly sell as much as 70 percent of their annual harvest. The plain has become Togo's prime yam-producing area in less than a decade, in large part because of the pioneering efforts of settlers.

The Broukou market at the FED-Agbassa project (Togo) draws traders from the entire region as well as from population centers more than 260 kilometers to the south. Even the young hamlet—recently turned village—of Dar-es-Salaam in Burkina Faso boasts a lively village market every third day. The village market, which is patronized by other pastoralists and agriculturalists in the region as well, has several privately owned mills and numerous shops. Our Daboura study site, located on a major road, has a sizable three-day market, a smaller daily market, a core of 15 to 20 shops that are open almost daily, and 2 small bakeries. Only 3 of the 26 markets frequented by settlers in AVV planned

settlements at Mogtedo, Linoghin, and Mogtedo Bombore (Figure 9.1) existed prior to 1974.

Mogtedo market has grown from 100 stalls, 5 shops, and a single grinding mill in 1975 to more than 800 stalls, 75 shops in separate buildings, 122 shops in semidetached buildings, and 10 mills in 1989. A recently completed survey of markets in the Solenzo subsector found 21 markets in villages and cultivation hamlets. Of these, 17 of the 21 had either been founded or moved since 1974 (CRPA du Mouhoun, *Suivi Evaluation*, Avril 1990).

Ghana (with one exception) was the only one of the four case-study countries in which new lands settlement in the OCP basins was not associated with a substantial increase in market development. In contrast to Burkina, Mali, and Togo, much settlement in Ghana involves people returning to places they had occupied before (Hunter 1966). The markets that they frequent are generally the markets they had frequented in the past. Our case studies in Ghana did not reveal increased market or town growth related to settlement, nor were there major gains in regional development involving more industries, traders, wholesalers, or related regional centers. The principal exception to this was Fumbisi town. Fumbisi is at the head of a potentially productive hinterland, the "Overseas" area. Fumbisi town developed in the 1970s, when southerners, area elites, and soldiers began commercial farming in the area. It has since kept up the pace. The town has the potential of contributing to the development of the hinterland, but this has yet to be realized.

Exchange of Commodities and Services

The market centers are foci for a range of important economic activities, but a critical feature of these interactions is the degree to which they are intimately associated with social exchanges. For the Ghana case study, the markets "bring everybody out to a central place, either to sell, buy, or barter something, to renew bonds of kinship, affinity, or amity, spread or share gossip, and for the greatest majority of adult males, to drink alcoholic beverages." (personal communication from Akwabi-Ameyaw, April 1990).

A particularly important activity at these markets is the sale of agricultural commodities (sorghum, maize, yams, etc.) from the immediate area for consumption within or outside the area, and agricultural commodities from outside the area (condiments, kola nuts, sugarcane, etc.) that

are consumed locally. Livestock and poultry are also traded at these markets. Specialized agricultural crops (cotton) may also be sold at the markets, but are most often handled by parallel marketing structures organized by OCP governments or parastatals (e.g., CMDT in Mali, SOTOCO in Togo).

The markets are also focal points for transactions of imported manufactured goods (canned tomato paste, salt, sugar, flour, kerosene, batteries, etc.) that are essential for day-to-day life, and that are available at sales points ranging from the well-stocked shops of resident traders at one extreme, to sellers at market stalls and wandering hawkers at the other. Other items widely bought and sold at the markets are manufactured locally and designed to satisfy local tastes and needs (prepared foods and alcoholic beverages, farm tools, locally woven cloth, pottery, basketry, locally tailored clothes, etc.). Finally, the market centers provide the area's inhabitants with a wide variety of services—tailoring, scribe and reading services, milling, barbering, and repairing of farm tools and portable radios.

Market Dynamics and Economic Diversification

These activities provide men and women in settlement areas with a diversity of on-farm and off-farm income sources. The markets feed and are fed in turn by the area's production and consumption dynamics and by their linkages with larger regions, the national economy as a whole, and, in the cases of markets in border areas (Togo and Burkina Faso), with neighboring countries. Sales of agricultural surpluses at good prices give producers satisfying returns. This puts money in their pockets and feeds effective demand in the area for a variety of off-farm activities (food preparation, services, artisanal production, etc.), all of which generate earnings for the men and women who practice them. This growing demand gives impetus to the diversification of household and local economies in the OCP areas.

Factors That Affect Market Dynamics

An effective market center enables an area's producers to sell their surpluses in a timely fashion and obtain the agricultural and manufactured commodities and services they need but do not

SAHELIAN AFRICA
 MARKETS FREQUENTED BY SETTLERS AND ABANDONED
 MARKETS CREATED BY THE AVV IN THE AVV SPONSORED
 SETTLEMENTS AT MOGTEDO, MOGTEDO-BOMBORE, AND
 LINOUGHIN IN BURKINA FASO, 1989

LOCALISATION ET TYPES DE MARCHES EXISTANTS OU
 ABANDONNES PAR LES MIGRANTS DES PERIMETRES AVV
 DE MOGTEDO, MOGTEDO-BOMBORE ET LINOUGHIN, 1989



- MAJOR REGIONAL MARKETS:
GRANDS MARCHES REGIONAUX:
- 1. MOGTEDO (TOWN)*
- 2. AVV LINOUGHIN V1
- 3. WARDOGO

- ◻ SUB-REGIONAL MARKETS:
MARCHES SOUS-REGIONAUX:
- 4. V4 AVV RAPADAMA
- 7. V5 AVV MOGTEDO-BOMBORE
- 9. V6 AVV MANKARAGA
- 11. RAPADAMA TRADITIONAL
- 5. GADEGHIN/V9 RAPADAMA AVV
- 6. GOLD MINE MARKET AT NOSSIN
- 12. YAÏKA*
- 13. TENLOUKA*
- 8. V4 AVV MANKARAGA

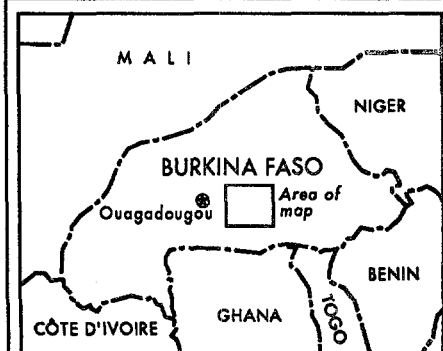
- ◻ AREA VILLAGE MARKET:
MARCHÉ DE ZONE (NIVEAU VILLAGES):
- 14. DAMONGO

- VILLAGE MARKETS:
MARCHES VILLAGEOIS:
- 15. AVV LINOUGHIN V4-V6
- 16. AVV LINOUGHIN V8
- 17. KOUGRI
- 18. ZANGA
- 19. MISSRI
- 10. GOLD MINE AVV MOGTEDO V3
- 26. MOGTEDO-BOMBORE V2

- ◐ ABANDONED MARKETS:
MARCHES ABANDONNES:
- 20. AVV LINOUGHIN V3
- 21. AVV RAPADAMA V1
- 22. AVV RAPADAMA V5
- 23. AVV MOGTEDO V5
- 24. AVV MOGTEDO V3
- 25. AVV MOGTEDO V1

*ESTABLISHED IN PRESENT LOCATION BEFORE 1974
 *MARCHÉ EN PLACE AVANT 1974

This map has been prepared by The World Bank's staff exclusively for the convenience of readers and is for the internal use of The World Bank Group. The denominations used and the boundaries shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.



JULY 1992

produce. The effectiveness of markets in the OCP areas is influenced by numerous factors. Year-round access to the area is critical to market development. Well-maintained all-weather roads are important, as is the accompanying infrastructure without which intra- and inter-regional exchange networks stop dead, particularly during the rainy season. These critical elements include, in addition to the trunk roads themselves, feeder roads, bridges, culverts, roadside drainage, etc. A particularly important problem, observed repeatedly in the country case studies, is poor maintenance of infrastructure. Once installed, infrastructure must be maintained.

Even modest infrastructural development can have a significant impact. In 1983, for example, SOTOCO built a bridge across the Mo River and a trunk road through Togo's Mo Plain. Before this, the area had remained isolated from the rest of the country during much of each year. The plain's economy was oriented more toward nearby Ghana than toward Togo, and the Ghanaian cedi was more commonly used than the CFA franc. Completion of the bridge and road opened up the plain and promoted rapid settlement, increased production of food crops for sale, the growth of several markets, and a strengthening of linkages between the area and nearby secondary cities in Togo. These improvements are important, but there is a pressing need for further investment in infrastructure; again, road maintenance, especially off the main trunk road, is a serious problem. A lack of government infrastructural investment in Ghana's "Overseas" area, by contrast, has left it isolated, undeveloped, and devoid of viable market development.

In the absence of regular and safe access, settlers are forced to accept low prices for their output from outside traders, or substantial wastage because their produce cannot be shipped from the area. Local gluts develop and poor storage leads to spoilage and loss (Ghana). Outside traders and transporters, facing high costs and risks because of poor roads and difficult access to OCP-area markets, demand higher prices for the commodities and services they sell to settlement-area populations. In some cases (Ghana), transporters have refused to service areas.

Willingness by both settler and host populations to trade at market centers in settlement areas is another significant factor in market

success. If area residents prefer to trade at older, established markets (and benefit from long-standing links with established traders), endeavors to establish new markets in OCP areas may flounder. If host populations boycott market centers that are organized in settlement areas (AVV-Mogtedo, Burkina Faso; FED-Agbassa, Togo) because of resentment toward the settlers and the government for taking over local land, the possibility of market stagnation or failure grows.

Preexisting conditions can affect market growth in other ways. Absence of an existing, host-controlled market in a settlement area presents opportunities for settlers to participate in organizing market transactions. Settlers at Linoghin (Burkina Faso), for example, created the local market, and have benefited from marketing opportunities that might not have been available had indigenous populations monopolized the market structures. This situation contrasts sharply with the Mogtedo settlement site in the same country. Indigenous inhabitants resented AVV interventions that gave settlers local lands. As a result, local people hindered participation by settlers in the Mogtedo market despite the market's strong growth.

Location and access to economically diverse populations also influence market dynamics. The Ghana and Burkina Faso case studies reveal that markets that were planned as part of a settlement scheme were more successful when they were located near the edge of a settlement area (Burkina Faso) or in a gateway location (Ghana) linking two distinctive areas. The most successful AVV markets were frequented by spontaneous settlers from adjacent areas and by pastoralists, in addition to AVV settlers. The less successful AVV markets drew essentially from settlers in the settlement blocks alone. The Fumbisi market, in Ghana's Upper East Region, provides a different example. It is experiencing rapid growth, largely because of its location as a gateway to the poorly served Fumbisi Valley and "Overseas" area. It is a nodal point between these hinterland areas and the road links connecting them with the district center at Sandema and with larger towns (Navrongo and Bolgatanga), and southern Ghana. Togo provides additional instances of strong market growth associated with location in border (Mo Plain) or transition (Broukou, FED-Agbassa) areas.

Provision of Social Services

Viable socioeconomic centers provide surrounding populations with important noncommercial services as well as markets. Centers having strong links with the surrounding area are more likely to offer secondary as well as primary education and literacy services. Higher levels of health care relative to outlying areas are available at the centers, frequently including maternal and child care and rudimentary hospital services. Pharmacy outlets are also important, for they offer populations in OCP areas models of diagnosis and treatment alternative to those of the indigenous practices that prevail in outlying areas. These centers often are sites of government offices and technical services, and they may additionally provide producer support services, in the form of agricultural and livestock extension services, and a clearing function for agricultural credit. In sum, viable centers should provide basic social services that contribute to settler health and well-being as well as supporting other aspects of human resource development among settler populations.

Possible Areas of Government and Nongovernment Intervention

Markets in the OCP areas form a hierarchy in terms of periodicity, number of participants, volume and nature of commodities and services exchanged, and radius of the markets' drawing power. This hierarchy, which is the spontaneous result of interlinked market and regional dynamics, provides planners with a point of departure for efforts to assist settlement and promote broader-based development in OCP areas. By examining the degree of market growth in relation to settlement areas, planners can discern which functions, services, and support (e.g., infrastructure) are needed to enhance the facilities in areas where markets occupy an intermediary or minor place in the overall hierarchy of a region.

Given the importance of socioeconomic centers and the prohibitive costs of creating them as part of a larger sponsored settlement package, planners could consider instead the option of linking a small sponsored settlement core, having a center, with outlying areas of spontaneous settlement.

10

Integration of Hosts, Settlers and Pastoralists

The Importance of Integration

Settlers moving into an OCP area are aware that their long-term success is linked to their ability to become integrated into a wider economic and social system. Such a system engages them in a wide range of relationships with:

- the indigenous agriculturalists or hosts who give them rights in land;
- pastoralists with traditional pasture rights in an area;
- other immigrant agriculturalists and pastoralists;
- indigenous and immigrant leaders.

Mutually beneficial linkages are different at each stage of the settlement process. To design more effective programs, policymakers need to be aware of the various interrelationships in settlement areas, and of factors that contribute to or detract from the peaceful integration of their different interests.

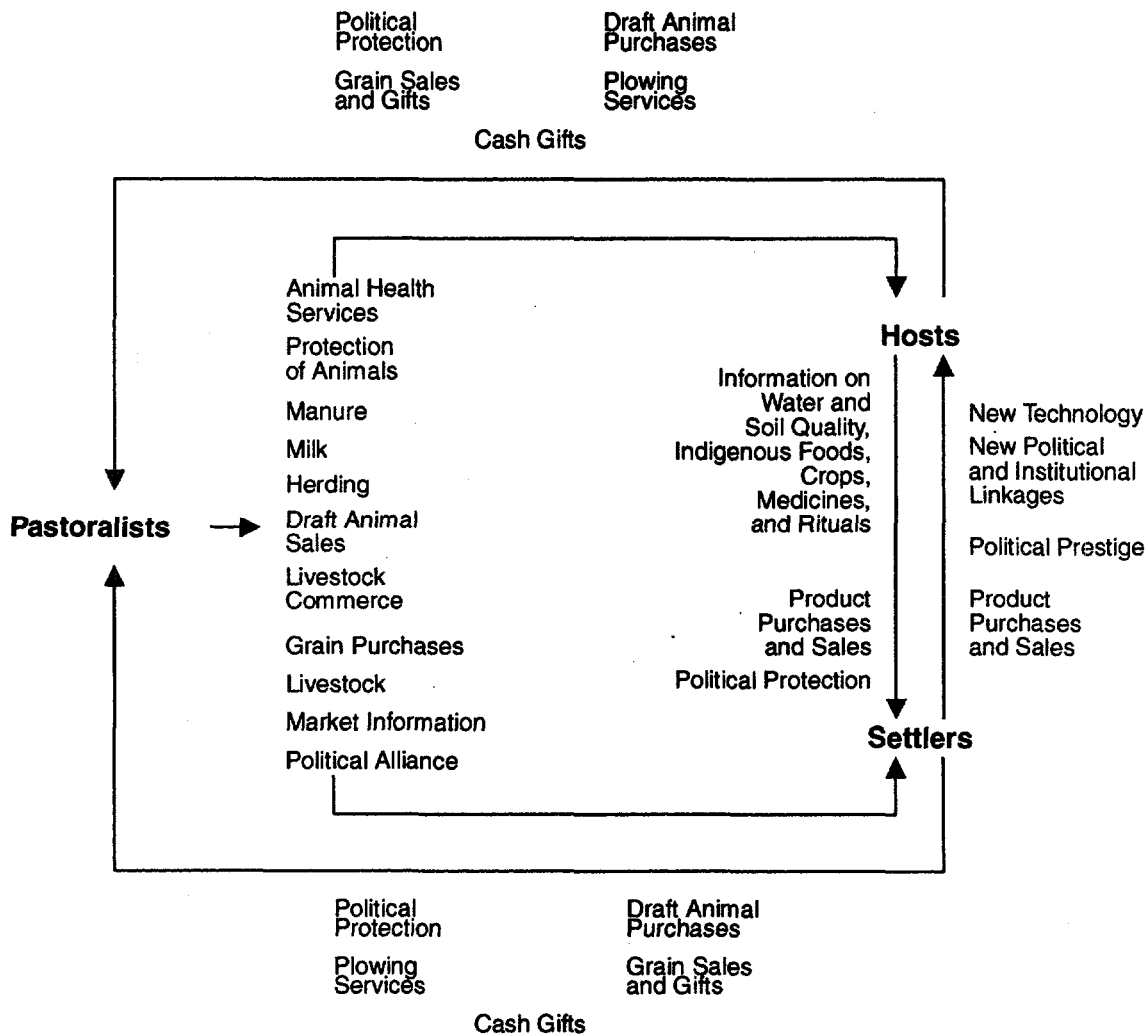
A complex interweaving or synergism exists between settlers (agricultural and pastoral) and hosts who provide access to land. The indigenous inhabitants also provide settlers with information on suitable settlement sites, soil quality, and potable water sources. They are knowledgeable about gathered foods, which are the main source of green vegetables for the daily sauces in most settlers' diets, and medicinal herbs, herb specialists, and healers. Learning from their hosts about the ritual status of specific sites, appropriate areas for burial, market sites, and the local hierarchy of

political and social groups, helps settlers feel more at home. For their part, settlers provide new markets for host farmers' products, contributing to the well-demonstrated association between new lands settlement and expanded area markets. Settlers also stimulate area development to the extent that they bring in new information on technology or new linkages to outside networks (Figure 10.1).

The first immigrants at many of the study sites were often sponsored by host farmers. The typical pattern was for a group of kinsmen to request land from an indigenous inhabitant (Chapter VI). Early immigrants then frequently sponsor the immigration of later settlers. Even when they are the sponsors, the early immigrants usually take newcomers to the same friendly sponsor who helped them acquire land. The settler household thus increases its allies, while at the same time increasing the allies and political prestige of its sponsor. Such sponsorship and mutual aid can provide the power base for a first generation of political leaders, who guide the new hybrid communities as they start to grow, diversify, and attract the attention of outside entrepreneurs and government authorities.

The value placed by settlers on peaceful, mutually beneficial integration with the host community is reflected in some instances in their continuation of traditional land tenure practices despite changes in national land tenure policies. Settlers know that, official land title or not, they will have few opportunities for a satisfactory

Figure 10.1 Integration of Hosts, Settlers, and Pastoralists



social or economic life if they have antagonistic relationships with other local groups.

Successful settlement and development in the OCP areas almost invariably is linked to increases in the size of livestock herds—of agriculturalists as well as pastoralists—and greater linkages between the agricultural and pastoral populations. The principal exceptions are settlers living in urban settings, although wealthy agriculturalists tend also to have large herds. In the absence of fundamental changes in national banking institutions, most rural farmers continue to invest in livestock.

Livestock is, of course, the principal source of income of pastoralist populations. Income from livestock sales or from herding agriculturalists' livestock is often used to purchase food; livestock

are also exchanged in kind for grain, and herding services may be reimbursed in meat and milk. For pastoral households who have no animals of their own, cash and in-kind revenues from herding constitute the principal means of support. Small livestock are a source of income and investment for women in many of the study sites. This was especially true at the more isolated sites, where opportunities for commercial enterprises were scanty.

Pastoralists are key players in any long-term strategy to develop more sustainable cropping systems. Since they normally own the most livestock, their contracts with settlers who want manure can be important for crop productivity. Because of constraints on labor and the difficulty of finding good pasture near their home sites,

agriculturalists often rely on pastoralists for herding services. In addition, pastoralists generally control the herds from which settlers buy their draft animals. When settlers have animals to sell, they reported in our interviews that pastoralists had the best market information and sometimes control regional livestock marketing systems. The pastoralists' knowledge of the attributes for animals' food and medicinal needs of various indigenous plants in the OCP areas is also vital to the herds' health. Hospitable relationships between agriculturalists and pastoralists were also shown to help reduce theft: it becomes more difficult for unidentified pastoralists or agriculturalists to move in and out of an area without being spotted. Fear of theft was frequently reported as a factor that discourages poorer settlers from purchasing draft animals in the AVV planned settlements.

If integration is not achieved in a satisfactory fashion, the potential for conflict rises as more and more settlers move into the areas that pastoralists need for their annual treks. A high frequency of conflict hurts the settlers' chances of negotiating herding and manure contracts. Local pastoralists are penalized with high fines for the destruction of farmers' crops by animals. Determining whose animals are at fault is complicated because many transhumant pastoralists move herds through a number of OCP areas. Local pastoralists who have more permanent grazing rights in the valleys often complain of being unjustly accused.

Although pastoralist-agriculturalist conflict was a problem at almost all the sites, it was more pronounced in some. In general, factors that seem to promote more peaceful relations between pastoralists and agriculturalists were also among the factors that promote peaceful relationships between migrants and indigenous inhabitants. Especially important was whether the pastoralists approached indigenous leaders to acquire cultivation and grazing rights. Such an approach helped create positive relationships between indigenous inhabitants and area pastoralists, averting much conflict and promoting peaceful collaboration.

Cultivator-Pastoralist Relations through Time

Because of difficulties in identifying the immigrant pastoralists, the case studies often underestimate the pastoralists' role in area land use patterns and settlement-related development.

Many of the same factors that attract pastoralists in large numbers—access to local and regional markets, availability of pasture land, isolation from agricultural settlements, and access to water—also attract agriculturalists.

If settlement is successful, a growing number of herders tends to be attracted to the sites by the prospect of herding cattle belonging to successful settlers and hosts. The interrelationships between pastoralists and agriculturalists are usually mutually beneficial. In the AVV planned settlements studied in Burkina, the "herder" pastoralists were generally poorer families who through drought, death, or disease had lost access to larger herds. Guarding the wealthier agriculturalists' animals is a way of reconstituting their herds. In return for working as herders, they receive grain and cash. From the larger livestock owners, herders also receive young animals born under their care and have rights to drink and sell the animals' milk. The sale of milk and milk products is often a source of income for pastoralists' wives.

Herding out their cattle to pastoralists has three major benefits for hosts and settlers. One is better use of family labor, the demands for herding frequently being beyond the capacity of settler households. Another is better care of livestock because herders have knowledge of and access to more distant forage. The third is reduced likelihood of conflicts over crop destruction, as animals are herded away from fields during the cropping season.

In AVV villages in Burkina, herders preferred to herd the animals of one powerful family, or a group of powerful families. Pastoralist households thereby gained a certain amount of political protection in addition to the other benefits of the relationship. The wealthier agriculturalists' interest in facilitating integration with the herders is reflected in an incident we observed in one of the AVV planned settlements. When the first rumors circulated about creating a village land management program, wealthier settler leaders took the initiative of encouraging pastoralists to organize to ensure that their needs would be considered.

The success that attracts livestock herders tends to attract more immigration by agriculturalists and pastoralists. This increases pressure on crop and pasture resources over time. The degree of pressure depends on the rate of immigration, which, in turn, is a function of other attractive features—like opportunities for trade—that attract settlers to an area. When second-stage migration

occurred in the area around the AVV-sponsored settlements in Burkina, a substantial growth in market activity appeared in the frontier zone between the sponsored settlements and the river.

The first indication of increasing population pressure is a steady escalation in accusations and formal litigation concerning livestock damage to crops. Faced with growing conflict, pastoralists must choose between leaving or developing new patterns of closer and generally more sedentarized interaction with agriculturalists. Pastoralists with significant herds that make them less dependent on the activities of the neighboring agriculturalists generally choose to move on, if land is available.

Out-migration is not a choice for pastoralists with small herds, who are forced to work as herders. It is these pastoralists that we typically find living in permanent camps around established settlements. Another option for pastoralists with or without herds of their own is sedentarization, which characteristically leads to greater involvement in crop production.

In OCP areas where new land is still available, pastoralists with the largest herds tend to keep moving—always moving away from the settlement tide. Yet pastoralist emigration from established settlements provides only temporary relief. As northern areas have filled up, countries like Côte d'Ivoire, Ghana, and Togo have received increasing amounts of spontaneous pastoralist immigration from the drier Sahelian countries. The "FulBe problem" has merely been exported, not resolved, by the pastoralists' moving south. Burkina's OCP basins are now catching the backwash of this earlier immigration. By late 1987, several thousand alleged Burkinabe pastoralists—virtually the entire FulBe population of Ghana—were expelled from that country by government edict. Social disturbances between agriculturalists and pastoralists also caused many pastoralists to flee across the Côte d'Ivoire border—some in such a hurry that they abandoned their herds. The repulsed pastoralists fled into the OCP basins, creating a dramatic increase in the area's pastoralist population.

Policy Implications

Land use patterns in the OCP areas are more likely to be sustainable over the long run if they achieve an equitable distribution of the benefits of settlement among pastoralists and agricultur-

alists. Interventions or events that threaten the security of either diminish the chances that the different groups will be individually willing to invest in sustainability. Moreover, long-term research suggests that the success of one group is invariably linked to success of the others. Unequal access to resources following interventions typically creates conflict, reducing mutually beneficial interactions between the groups. One-sided benefits can also create an atmosphere of conflict that reduces the settlers' sense of personal investment in a region. In either case, sustainability is threatened.

Zoning for Agriculture, Pastoralism, and Common Resource Management

One promising program to facilitate integration of hosts, settlers, and pastoralists in the OCP areas is the village land management (PNGT) model currently being promoted by several West African governments, and the World Bank and other donors. The PNGT model combines zoning, to delineate different categories of land use (including forest reserves), with the creation of (and outside institutional recognition of) a village land management committee. Hosts, settlers, and pastoralists living at the site are entitled to receive land in the different cultivation zones. In theory, only village pastoralists (that is, pastoralists who have settled permanently near a village and who farm) and the village agriculturalists are entitled to keep their animals in the village pastoral zone. Under the model, any immigrant—pastoralist or agriculturalist—must pass through the committee to acquire land rights in the village. Once constituted and officially recognized, the village land management committee can place certain restrictions on the acquisitions of land rights, such as specifications concerning land use practices and the amount of land that can be legally cleared.

If implemented early in the settlement process, rather than later as a rehabilitation effort as has generally been the case to date in the OCP areas, the PNGT model offers an unusual opportunity to protect the interests of indigenous inhabitants by allowing them some measure of control over immigration onto their land. Similarly, it gives settlers some legal recognition of their claims. Finally, it protects pastoralists by assigning them a clearly delineated area of land for cattle.

Zoning for Agropastoralism and Pastoralism

Zoning village lands for agriculture, pastoralism, and common resource management is not a viable alternative for pastoralists with large herds, because they tend to move away from established settlements as these increase in size in order to avoid conflicts over crop damage. One policy option involves zoning large, special areas for agropastoralism and pastoralism. The goal would be to enable pastoralists to sedentarize on their own terms, by introducing agropastoralism into pastoralists' production systems, through a combination of intensive livestock production techniques and small amounts of farming. In such a model, an area is zoned especially for pastoralists.

As with other sorts of assisted-settlement programs, there are generally criteria for belonging—such as length of time a group has been herding in an area, or affiliation with an area village. Again, as in other types of assisted settlement, the goal is to facilitate localization of the pastoralists' production systems by providing basic infrastructure (roads, water points), schools, and human and livestock health services. In general, the pastoralist populations we worked with strongly favored the creation of pastoral zones, principally because they provided areas where the pastoralists could live with reduced competition and conflict with the agriculturalists.

11

Knowledge and Management of the Natural Resource Base

The OCP areas represent one of West Africa's great protected land resources. Yet differences exist among river basins, and even across areas within the same river basin, in soil quality and the adaptability of the soils to diverse uses (Hunting Technical Services 1988a, b, c, d; Hervouet et al. 1984; Berg et al. 1978). Some soils, for example, are very prone to erosion if cultivated extensively with little attention to soil amendments and water-retention technology. While many of these areas may be perfectly suited to livestock or managed forest or wildlife reserves, they can be permanently damaged by extensive farming at existing levels of crop technology.

The effects of degradation are not limited by national borders. In the *Seven Country Review*, Buursink with Painter (1990) argue, for example, that uncontrolled settlement in the upper catchment basin of Guinea could lead to erosion and degradation problems that will affect the watersheds of at least six other countries (Gambia, Mali, Mauritania, Niger, Nigeria, and Senegal). Similarly, the social and economic consequences of population pressure on existing land-management practices can easily spill over national borders—a fact most recently illustrated by the pastoralists moving back out of Côte d'Ivoire and Ghana into Burkina.

National governments and foreign donors are therefore justifiably concerned about environmental management in the OCP areas. The ultimate goal of such management is the sustained use of the OCP lands for agriculture, range,

forestry, and recreational purposes. Successful planning and implementation require not only the active collaboration of people living in the affected regions, but also their perception that natural resource management will benefit them economically. The people living in the OCP areas are the ones who have the most intimate knowledge of area water, soil, forest, and wildlife resources. In the planning stages, this knowledge can contribute innovative ideas for land-management practices. The voluntary participation of people in the OCP areas is also a vital first step for ensuring widespread acceptance of new technology as well as zoning restrictions.

Top-down projects that attempt to legislate land use without collaboration from local political authorities and inhabitants are almost always doomed to failure. Without voluntary collaboration at the local level, national governments must rely on an expensive, dense network of extension agents or rangers. Few West African governments have the resources for patrolling their wildlife and forest areas, much less for controlling land use practices in areas dedicated to cropping and livestock rearing.

The inhabitants of the OCP areas will not respect area zoning and innovative land-management practices unless they are persuaded to do so by a belief that: (a) the innovative techniques will in fact benefit them in the long run, and (b) the benefits for their household's standard of living will outweigh the higher cash and labor costs of the management changes.

Lessons Learned

The Dilemma of Extensive Cultivation Methods

The extensive crop and livestock production systems being established in the OCP areas make sense under a set of environmental conditions where new land is easily cleared and farmed, and the social and economic costs of leaving worn out land are very low.

If immigration rates are low, as in the Niangolo area and the Kompienga Basin (before construction of the dam) in Burkina, extensive agricultural cultivation is generally ecologically and socially sustainable: population densities are low, and reserve lands are still available. In addition, there is usually little in the way of social and economic infrastructure other than access roads and markets that makes one village setting more attractive than another for nonindigenous residents. In these "traditional" extensive systems, the primary factor determining production levels is the size of the family labor force. The rational strategy for settlers, therefore, is to clear and plant the largest area possible. As opportunities for nonfarm employment are often quite restricted, settlers in these extensive systems typically continue to invest in the sending areas or in local livestock production.

Invariably, however, problems arise as population densities increase. When a settlement reaches this stage, it is more difficult to allow the land to lie fallow for the length of time necessary to restore soil fertility. Increased pressure on the settlement's natural resources is generally associated with rising levels of social conflict among settlers, hosts, and pastoralists. Predictable sources of conflict include livestock damage to settler crops as herd size increases, growing problems with potable water because of higher demand and maintenance requirements, pastoralist resentment at being denied access to former grazing areas and water sources, and a diminished supply of easily accessible fuelwood.

The extensive land use system works as long as land is plentiful; it breaks down when land resources become scarcer. By the time a crisis occurs, levels of social conflict may be so high as to discourage the concerted community and household action needed for developing more sustainable land use systems.

Limited Success of Current Programs to Promote Sustainable Land-Management Practices

Government efforts to promote sustainable land-management practices in the OCP areas have focused on: (1) regional and catchment-basin surveys of the river basins in order to classify them in terms of recommended categories of land use (cropping, grazing, managed forestry, national parks, etc.), and (2) efforts to promote higher-yielding crop and livestock practices.

Basic elements of the crop-production programs, which included subsidies for animal traction and fertilizer, were successful in helping groups of farmers with limited resources to achieve high rates of agricultural income growth in the very first years of affiliation with these projects. Interviews with extension staff, as well as information recorded in the case studies, however, suggest that the present systems will not be sustainable at existing levels of input use. At least in higher rainfall OCP areas with better soils, the problem arises not so much from the proposed extension package as from partial adoption of the program. Settlers and hosts alike tended to use animal traction to cultivate the largest area possible, with minimal use of fertilizer or other recommended soil amendments. In general, cash crops (especially cotton) received the heaviest amounts of mineral fertilizer.

The result was a reported stagnation or slight decline in yields at older sites, where the bulk of the settlers had been living for ten years or more, and where new land was no longer being cleared and brought into the farming system. Indicators of "tired land" most commonly cited include declining production, a proliferation of *Striga hermonthica*, and increased growth of other weeds. The severity of the decline varied substantially, depending on soil quality, climate, and cultivation techniques (rotation, manure, fertilizer), as well as on the local availability of "new" land. In higher-rainfall OCP areas (above 800 mm) like FED-Agbassa in Togo, Dioila in Mali, and Solenzo in Burkina, extension agents are just beginning to express concern. In lower-rainfall areas like the AVV planned settlements in the upper Nakambe (ex-White Volta) east of Ouagadougou, the problems are considerably more advanced, and the extension service has placed land management, water harvesting, and soil fertility issues at the forefront of current extension programs.

Interrelationship between Sustainability and Diversification

In the AVV planned settlements in Burkina Faso, the linkage between land deterioration and settlers' willingness to invest in the development of more sustainable crop, livestock, and forest production practices was mediated by the availability of opportunities for earning off-farm income. The more diversified the opportunity structure, the greater the likelihood that settlers would modify their production strategies by investing their time and money in more intensive land-management practices.

The relation between access to resources and environmentally sound farming practice in Burkina Faso resembles the experience in Mali. Koenig sums up her presentation of the Mali case-study materials by arguing—as have the other case-study authors as well as observers of soil erosion problems in other areas of the world—that poverty and soil conservation do not go together. The development of sustainable land management-practices requires that smallholders not be so impoverished that they are forced to overexploit their environment in order to survive (Blaikie 1985; Blaikie and Brookfield 1987; Painter 1987a,b).

Precedent for Sustainability in Indigenous Production Practices

Some settlers who practice extensive cultivation in OCP areas (the Dogon in Mali, and the Kabye and Losso in Togo) are members of ethnic groups that are well-known for intensive agricultural practices in their home areas. In such cases, intensification often is a response to high population densities in mountainous areas. Even groups in non-mountainous areas like the Gourmanche and Bobo practice certain types of indigenous soil- and water-conserving techniques. These techniques include planting trees as windbreaks and constructing small mounds and ditches to reduce erosion, as well as using different types of soil amendments like manure, straw, and composting. There is no reason, a priori, why settlers having traditions of intensive cultivation should shift to a seemingly boundless, extensive mode of production once they arrive in new territory that appears free of land constraints. We can, nonetheless, appreciate the settlers' response to apparently limitless possibilities for expanding the total area farmed and increasing their returns to labor.

Experimental Programs to Regulate Land Clearance and Land Use

Successful programs to promote the development of sustainable production systems will undoubtedly need to combine sound extension programs with some sort of regulation as to the total amount of land that can be cleared.

One model for this sort of combined approach is the land-management system that was implemented by the AVV sponsored settlements. Settlers' cultivation was restricted to a given area of house and bush fields. In addition, each planned settlement included areas set aside for forestry and livestock. In return for the right to cultivate a farm in one of the "improved" project villages—with access to roads, schools, health facilities, and water points—settlers were required to adopt a recommended package of intensive cultivation techniques and to respect the project zoning.

A comparison of the project plan for restricted, registered land use with actual land use patterns ten years later shows that the settlers did respect the broad outlines of the crop cultivation bands. In contrast, in areas where no such controls were imposed, settlers used labor-saving technology like plows and tractors to cultivate the largest area possible. In Solenzo in Burkina, for example, a few successful farmers were able to cultivate as much as 40 to 50 hectares per family with mini-tractors. This accounts for the sizable differences in total land area farmed per unit labor between the AVV sites, where controls were exercised, and the Solenzo region, where they were not. Differences between the average area cultivated per unit labor were less dramatic between groups with animal traction in the two areas, but a higher percentage of the Solenzo farmers' fields were newly cleared.

While the restrictions on land tenure in the sponsored settlements contributed to more "stable" production systems (i.e., less prone to extensive land clearance than were the unrestricted commercial cotton systems), overall, the production practices were not more sustainable. Moreover, neither settlers nor extension staff were able to control unauthorized immigration of cultivators and pastoralists onto village lands designated for other purposes. They were also unable to control illegal woodcutting in areas designated as reserves.

Linking Security of Tenure with Regulation and Incentives

IDA recommends that programs to regulate land use be paired with mechanisms that facilitate the community's ability, through legally registered land management associations, to regulate access to and management of the land resources to which they have recognized authority—the community here including hosts, settlers, and pastoralists. A key problem of existing programs is that they give communities responsibility, but no effective recognition, at either the regional or national level, of this right to regulate. Despite the formal right to cultivate in a given area, settlers rights have been contested.

For inhabitants to invest in sustainable techniques, especially in such relatively permanent alterations as planting trees, requires that access rights be clear. Governments must therefore work with local groups and authorities to ensure security of tenure and clarity as to its terms, and to effect a clear understanding and agreement by all the inhabitants—hosts, settlers, pastoralists, and regional administrators alike—concerning the new communities' land rights and obligations.

The PNGT Approach

One of the most promising models that addresses the question of regional land use planning at different levels is the village land management model currently being promoted by donors and national governments in several OCP countries.

Implementing the PNGT Model

PNGTV or PNGT in Burkina Faso was developed to help villages and regional development organizations implement the themes advocated by the national program for agrarian reform. The themes and approach adopted were heavily influenced by the experience of the AVV in land use and cooperative development in the OCP zones (Guyon 1986:12).

The crucial first step in local participation in the PNGT involves the village's election of a land management committee responsible for determining land allocation and for dealing with outside authorities. The committee includes representatives of the major social groups living in the village. Second, the rights of each group—pastoralists and agriculturalists, recent immigrants and long-time

residents—are represented by the delineation of village frontiers. Delineation is organized by the committee in cooperation with regional authorities and neighboring villages. Technicians and the committee work with individual inhabitants to plot field and village boundaries and home sites on large-scale aerial photographs and maps.

The third step involves negotiating a contract between the village land management committee and the state. The community agrees to acknowledge a certain number of themes: soil preservation, respect for forestry, improved pasturage, and suppression of bush fires, while the state helps the village to achieve basic infrastructure and land improvements. The village contract and land survey guarantees the villagers official recognition of their rights to the land and any future improvements that they make on it.

Planners may be tempted to encourage settlers to deal with violations of guidelines with sanctions such as expulsion from the village, or denying access to important services (e.g., credit), but experience with sponsored settlements shows the naïveté of such approaches. Our studies demonstrate that where guidelines are rigidly enforced, the effect on settler social relations and commitment to sustainability is often the opposite of that desired by the program. Instead of encouraging settlers to invest more, strict implementation is a disincentive, making settlers fear that they too, should they fall upon hard times, might be subject to expulsion. Existing, informal mechanisms to promote conformity are more effective than threats of outside intervention. Therefore, planners should emphasize stimulating community members to reach consensus rather than using rigid guidelines.

National Coordination and Pilot Programs

A national Coordination Unit (*Cellule de Coordination*) was created in 1986 to help ministries implement a series of pilot projects following the PNGT model. The Unit, which provided some limited assistance with conceptualization of the pilot projects as well as direct support for aerial photography and cartography, was attached to the Ministry of Plan, with special aid from the World Bank, *Caisse Centrale de Coopération Economique*, and other donors. Its main activities have so far focused on monitoring the pilot projects in an attempt to refine the program guidelines and recommendations (PNGTV 1989).

Several experimental programs to work with spontaneous settlers and pastoralists in the OCP zones have been incorporated into the PNGT program. One involves bringing spontaneous settlers into the extension, credit, and land-management programs of the older AVV planned settlements at Rapadama. Planning is under way to create similar *gestion de terroir villageois* (village land management) programs that will include spontaneous settlers in all of the older AVV planned settlements. Another type of experimental assisted-settlement program that is being tried in Burkina under the PNGT incorporates spontaneous settlers and hosts into joint land use committees. The program was being tried at three different experimental sites in the CRPA *du Mouhoun*; one of these was included as a study site for this review. Special emphasis is being placed on encouraging the settlers to restrict uncontrolled land clearance.

The village land management committees in Burkina appear ideally suited for experimenting with potentially more sustainable production methods. Examples include (aside from the use of chemical fertilizers and mineral additives) upgrading soil texture and fertility by incorporating mulch, compost, and other wastes; constructing terraces, ditches, or rock lines or planting tuft-grass along field contours; building small dikes or mini-dams along runoff courses to slow or capture water flow and trap silt and detritus; and using tied ridges in fields. Additional interventions include planting trees or large wood shrubs in woodlot and windbreak configurations, and organizing local-level management of forest and bush lands. These measures are of proven utility, are low cost (but often labor-intensive), and are valuable complements to techniques (e.g., use of fertilizer) that are strongly recommended by all governments and NGOs, but that frequently elude the grasp of smallholders who may not be able to afford the price or who, because of government policy, are denied credit.

Although the PNGT program is still in the experimental stages, in several instances a program has been quite successful in introducing more-sustainable practices. One of the most interesting is the *Projet Aménagement des Terroirs et Conservation des Ressources dans le Plateau Central* (PATECORE), in the Bam province of north central Burkina Faso. Although it is not in an OCP river basin, the project provides an example of the development potential of the PNGT concept.

The project works only with villages where the people are strongly concerned about soil deterioration and its impact on production, and have already shown some willingness to grapple with the problem (PNGTV 1989:70). This pilot project, like all the others undertaken under the auspices of the PNGT, involves local villages in efforts to develop a strategy for dealing with problems identified by their communities. With assistance from a geographer, a forester, and representatives from all government technical services, village committees used collective local knowledge and aerial photographs (with a scale of 1:10,000) to determine the limits of village lands. This information was transformed into a village land map as part of the PNGT strategy to encourage villages to conceive of their area as a finite, bounded space within which specific management tasks could be undertaken to deal with specific problems.

Each consultative group includes representatives from all technical services, projects, programs, and NGOs that are involved in the area's development. This organization is responsible for pulling together useful information on all major sectors (livestock, agriculture, etc.) found within the village lands. Many government, bilateral, and nongovernment groups active in the OCP countries work with little coordination; they duplicate efforts. Use of the consultative structure facilitates coordination of activities and helps to avoid overlap between activities of different organizations. It also enhances the possibilities for sharing some resources (principally training opportunities) among local organizations that have different levels of financial backing (PNGTV 1989:134-136).

One strong feature of the PNGT approach is that it premises the entire program on the critical first step of settler participation in regional and village-level land use planning. This local participation includes all the affected inhabitants, not just new immigrants, thus providing one mechanism for offsetting the perception of hosts and pastoralists that their needs are being overlooked to the benefit of the settlers. The strong reliance on local input means that the approach is generally more cost effective than top-down development approaches. Settlers' knowledge about soil quality and climatic conditions enhances the likelihood that planning will be appropriate as well as cost-effective. The approach is also well-suited to NGO involvement.

The PNGT experience is particularly relevant to our concern about how to set up local organizations

in other OCP countries to coordinate actions that concern management, or conservation and restoration of the natural resource base. Members manage access to and use of village lands with a view toward sustainable production and enhanced welfare.

Other Programs

Programs to Promote Sustainable Cropping

Numerous government agencies, bilateral organizations, and NGOs are experimenting with and promoting techniques that aim for sustainable production in the OCP countries. Much of this activity occurs on a piecemeal basis and often it is not directly linked to OCP area settlement. The governments of each OCP country should take a census of these activities; obtain the best possible critical assessments of their requirements, costs, and results; monitor their progress; and consider how to incorporate different elements suggested in this report and in the PNGT model to make these programs more responsive to development planning in the OCP areas. Several ongoing endeavors are noteworthy by way of example.

The Mali government is considering a program that emphasizes local organizations in managing village lands and bush lands—a program similar in many respects to the PNGT effort. A logical extension of this local-level management approach would focus on appropriate measures for dealing with erosion and loss of soil fertility. In Togo, volunteers of the U.S. Peace Corps are experimenting with a variety of erosion-control and water-management techniques. The results of these trials may provide a valuable resource for development organizations and the Government of Togo as they approach the formidable task of planning for and, at the same time catching up with, assisted settlement in the Mo Plain and other areas.

No such measures are presently being used in Ghana despite a pressing need in the fragile land areas typical of OCP zones in the north of the country. Global 2000 has been operating in Ghana since 1986 on the premise that low levels of agricultural productivity are caused by inadequate management of available resources, but its approach appears to focus solely on developing appropriate technical packages. There is no evidence of a conservationist or explicitly anti-erosion component to Global 2000's otherwise commendable program in northern Ghana.

Experimental Programs for Pastoral Zones

Land use planning for livestock production has focused on the delineation of range areas in connection with village land-management programs, and on the delineation of large, separate pastoral zones. Pastoral zones have been created, for example, in Gadeghin, Sondre-Est, Nouhao, and Leo in Burkina Faso. Membership in the zone-management committee is generally linked to previous residence in an area. The project is responsible for delineating the zone frontiers and installing veterinary, human health, and education services; basic infrastructure; and water points for the pastoralists. In return for the right to herd its animals in the area, a pastoralist family is required to follow a recommended program to promote more intensive crop and livestock production.

Recent programs to create separate pastoral zones in Burkina Faso have been plagued by some of the same planning problems as crop-development programs. Chief among these is the determination of zone boundaries and clarification of the pastoralists' land tenure. In most cases, areas designated for these projects were selected in the early 1970s, during initial planning conducted by the AVV. In general, however, concern with the creation of pastoral zones did not arise until after the first decade of sponsored settlements, when mounting levels of social conflict between cultivators and pastoralists forced planners to build on the original base of surveys and zoning recommendations to create actual projects. By then, many of the zones designated for pastoralist development had been occupied by spontaneous settlers.

More than 200 families had to be removed from the site of the Gadeghin pastoral zone, for example, when the AVV and the regional development organization began to enforce the zoning boundaries and to create the proposed base of infrastructure to support more intensive livestock systems in the late 1980s. All the spontaneous settlers at the site had immigrated since 1974 when the zoning had been officially recommended. Forced removal of the settlers from the proposed pastoral zone soured the previously hospitable relations between settlers in the AVV sponsored settlements at Rapadama and spontaneous settlers in the adjacent areas, and contributed to the virtual collapse of the Gadeghin/V9 Rapadama market (number 5 on figure 9.1), which had

become the most prosperous interior market in the river basin.

The success of the Gadeghin/V9 Rapadama market had stemmed from its location in the frontier area among different land use groups—the pastoralists beyond the river, the spontaneous settlers in the barrier between the pastoralists and the AVV sponsored settlers, and the settlers living in the AVV sponsored settlements at Rapadama. The ill feelings associated with the forced relocations, coupled with the collapse of commercial activities, contributed to the departure of 17 households from the closest AVV sponsored settlements.

Future planning should include greater attention to delineating settlement boundaries. Likely to succeed will be programs that attempt to define clearly at a very early stage—through paint and other sorts of geographical boundaries—areas identified for pastoral development so as to minimize the chances of their being occupied spontaneously. As with the village land-management model, zone frontiers should be traced on aerial-photo-based maps through a collaborative effort with neighboring indigenous and settler groups. Settlers and hosts recognize that long-term development of their own diversified production systems is linked to good relations with the pastoralists. Facilitating development of large pastoral zones as well as village areas dedicated to pastoralists enhances the probability that the two groups will be able to regulate their separate and interrelated land use patterns with less conflict.

Experimental Programs to Work with Settlers and Indigenous Inhabitants in Areas alongside Classified Forests

Because of their low population densities, many areas in the OCP basins were designated as classified forests in the 1950s. West African governments are now concerned that onchocerciasis control may increase illegal clearance and occupation of these forests. There is a fear of recolonization by the indigenous population as well as by outsiders arriving as spontaneous settlers. The fear is especially great for classified forests near major cities, where the demand for both fuelwood and cultivation sites is likely to grow during the years ahead.

One promising model for development in areas near classified forests involves generating non-farm sources of income, such as controlled cutting of firewood, charcoal making, and beekeeping,

from sustainable forest resources. Such development creates a group of people who have a vested economic interest in regulating those who attempt to violate the forest.

It would be naive, however, to think that such projects alone could provide the principal sources of income growth for populations in surrounding villages. Over the long run, multiple-use forest projects must be combined with the development of other sectors, including crop and livestock production. These programs, together with the implementation of a system of village land management to regulate land clearance and land use could, over time, provide a sustainable mix of income opportunities for villages that front on classified forests.

Commercial Wood Projects

No amount of village land management is likely to be sufficient to offset the growing demand of Africa's cities for fuelwood. Any long-term planning to preserve the forests will have to include the development of managed forestry projects to offset this demand.

Forestry projects often have emphasized the use of exotic tree species to provide fuelwood, lumber, and, occasionally, green belts near cities. Rarely have such projects focused on the potential of brushland, particularly in the northern parts of the OCP areas. One very promising approach involves developing management plans for sustainable production of fuelwood from such naturally occurring brushland areas. This approach combines concern about managing natural resources with rational and sustained exploitation of the resource base for the benefit of surrounding populations. Pioneering work of this kind began in 1981 in the Guesselbodi National Forest of Niger. The approach has since been used in several other sahelian countries (Heermans 1986; Painter 1987a).

Need for Land Use Planning to Include Existing Settlement Areas as Well as Areas of New Land Settlement

Throughout this report we have emphasized the potential of the OCP areas for developing more sustainable production systems. Targeted funding for the OCP areas should not, however, be at the expense of the sending areas from which settlers are emigrating in large numbers. Nor should

targeted investment in OCP areas be at the expense of developing preexisting settlement areas that are adjacent to sparsely populated river basins. Overemphasizing the OCP areas would be analogous to early strategies of investing in Africa's urban areas (Harris and Todaro 1970), with little attention paid to raising rural incomes. The net result was to spur increased immigration to the cities, creating even more urgent urban problems rather than solving them.

The upper Nakambe (ex-White Volta) basin in Burkina Faso provides an example of this problem. There, investment in regional development (schools, water points, extension workers) was heavily focused on the AVV planned settlements created between 1974 and 1979, with very little funding targeted to adjacent areas containing established settlements. This investment spurred a second-generation immigration by agriculturalists from the established areas to places near the sponsored settlements. By 1988, the ratio of spontaneous agricultural and pastoral immigrants to sponsored settlers was conservatively estimated at two to one in the AVV sponsored settlements at Rapadama, and about three to one at Linoghin (AVV 1988); estimates of spontaneous immigration to the area near the AVV planned settlements at Mogtedo Bombore and Mogtedo are generally lower (about one to one) (Sawadogo 1988). In contrast to the sponsored settlers, who generally came from the more distant plateau areas in the center of the country, 90 to 95 percent of the spontaneous settlers came from areas in the same province, with higher population densities and limited infrastructure (AVV 1985c, 1988; Sawadogo 1988). Reorganization of the AVV in 1982 entailed a shift of the program's focus to a wider concern with regional development. The AVV-UP1 (Planning Unit 1), which was created in response to these wider concerns, has focused on targeted investment and extension to offset imbalances between the sponsored settlements and the rest of the region. It is a difficult game of "catch-up," but one from which we can learn lessons for the future.

How to Proceed

As early in the settlement process as possible, government agencies and NGOs should encourage hosts, settlers and pastoralists using geographically defined areas (such as tributary catchment basins, or portions of such basins) to form community land management associations. As with

the water user associations that have been so effective in irrigated areas in southern Spain, the western United States, and in parts of Asia, and are now being modified for irrigation elsewhere, the emphasis should be on associations rather than committees, so as to expedite their registration as village corporations. Such associations need legal standing that is recognized at the national level so that they can, for example, have secure title to land and receive credit from banks.

Once established such associations should work with neighboring communities, government agencies and NGOs to:

- Delineate on large-scale aerial photographs and maps clear areas of recommended land use (based on indigenous knowledge complemented by soil, hydraulic, and sociological survey data) that allow residents and policy makers to formulate optimal land use patterns and relevant extension methods to encourage development in an area.

- With strong community involvement, designate land use zones on aerial-photograph-based maps (a set of which remains with the community), the purpose of such zones being to facilitate natural resource management, development, and conflict resolution.

Zoning to delineate and protect areas best suited for crop, range, or forest purposes is most likely to be successful when it includes a combination of restrictions and incentives. Incentives should provide rights of access and economic benefits sufficient to encourage communities to manage and enhance, rather than to mine, natural resources. Restrictions will necessarily involve regional and national planning that determines that particular OCP areas should be used for certain purposes (cropping, livestock, forestry), and not for others (Buursink with Painter 1990). The more successful models will be those that combine areas zoned for different categories of land management with programs that facilitate active involvement of local inhabitants in planning and monitoring the zoning and land management practices.

- Improve the community's ability to regulate access to and management of its natural resource base.

- Enhance the desirability of living in the area (and, conversely, increase the social and economic costs of leaving it) by ensuring a desirable level of economic opportunities and social facilities for all household members.

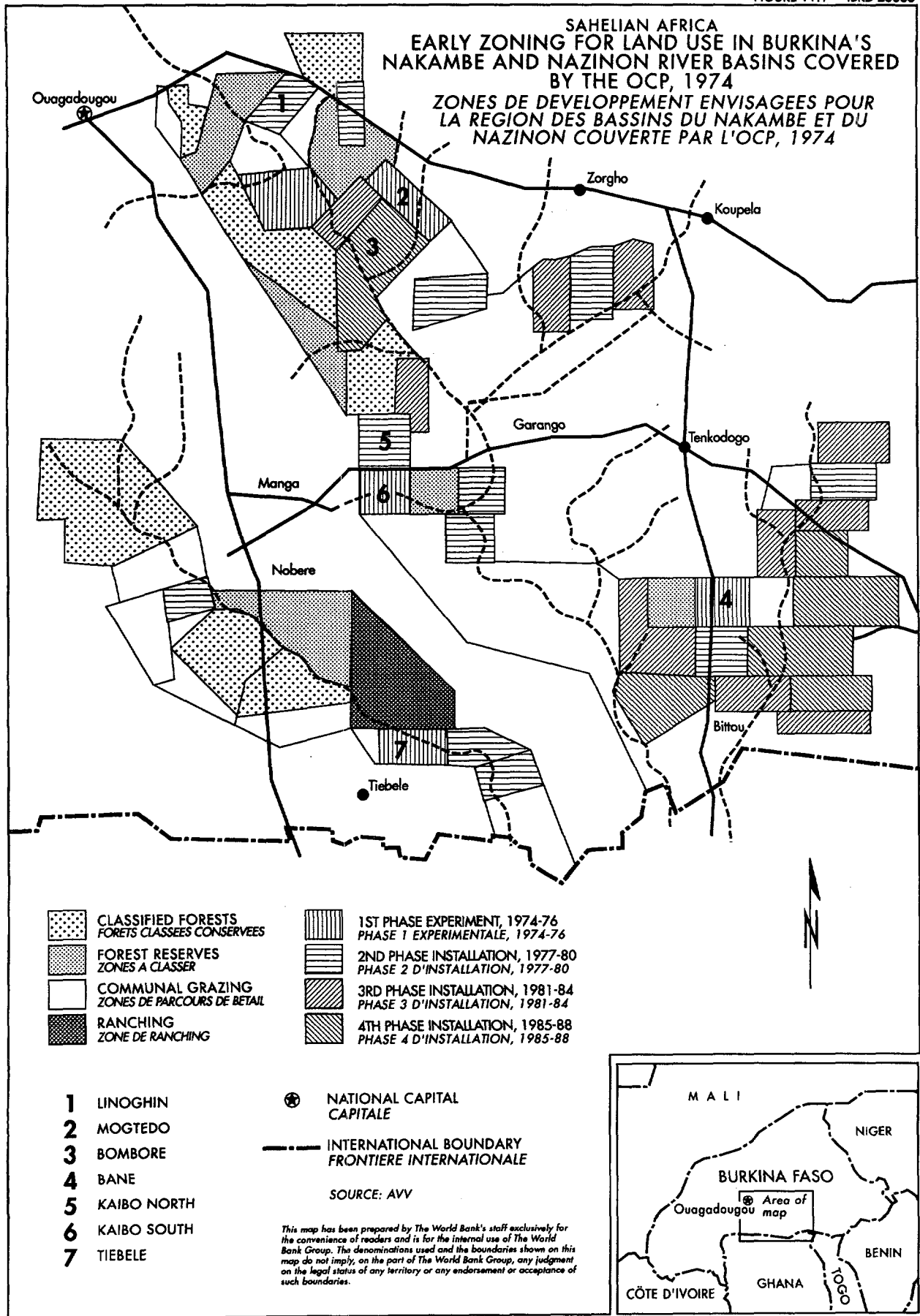
Without programs to improve the existing base of social and economic services, settlers are not

likely to invest either the time or resources that will be needed to develop sustainable land use patterns. Again, the most frequently requested infrastructure improvements are likely to be roads, water points, health facilities, and schools. Relying on indigenous expertise about where roads, wells, and bridges should be built, and what are appropriate construction materials, improves the chances that the new infrastructure will be used and maintained.

- Facilitate the development of special income opportunities, utilizing sustainable forest resources, for example, for groups living along the edge of classified forests and wildlife areas.

In view of the particular threat that spontaneous settlement poses to forests, special programs should be developed for these areas. Our recommendation is that in addition to zoning, programs to develop sustainable income sources from the forests should be encouraged. Such programs imbue a group of local inhabitants with an economic interest in conserving the forest areas.

While village land management associations or committees (as with the PNGTV approach) appear to have considerable development potential, it is important to incorporate them within wider regional, national, and even international land use planning. As part of the initial planning for the OCP, UNDP offered a \$500,000 grant to the seven original OCP countries to prepare a proposal for how best to incorporate its OCP areas into national development planning. Some countries used these initial grants to conduct additional aerial, soil, hydraulic, and socioeconomic surveys to help classify the affected river basins according to soil type and recommended land use practices. On the basis of these initial surveys, some of the OCP states developed tentative plans for a series of settlement, forestry, and livestock projects such as the one shown in Figure 11.1. This sort of preliminary planning and zoning is a vital and essential first step and needs to be encouraged at regional, national, and international levels.



12

Local Participation, Management, and Institutions

It is one thing to advocate effective local participation, management, and institutions, but quite a different thing to achieve them in any development setting. In settlement areas, the emergence of local participatory organizations is made more difficult for two reasons. The first is the lack of community organization at the time of initial settlement. Since settlers tend to migrate to new lands as individual families or as small clusters of kin and neighbors, it takes time for such aggregates of people to develop effective cooperative linkages. The second is the heterogeneity of settlement areas, where hosts and settlers are frequently combined with transhumant pastoralists.

Throughout Africa, inadequate management at all levels of institutional involvement has led multilateral and bilateral donors severely to criticize such complex development strategies as regional and integrated area development. Highly centralized, hierarchically organized and autonomous management institutions have also come in for strong criticism. This poses a dilemma for the development of underpopulated areas, since the major government strategy over the past half century in Africa has consisted of sponsored settlement implemented by autonomous or semiautonomous organizations with regional development as one of their goals. Occasionally, this approach has been at least partially successful, examples being Kenya's Mwea Scheme; the Gezira, New Halfa, and Rahad Schemes in the Sudan; and projects planned and implemented by the AVV in Burkina Faso.

IDA believes nonetheless that spontaneous settlements are best planned and implemented by line ministries (including special OCP area units within those ministries) and other existing agencies rather than by autonomous or semiautonomous settlement agencies. Since an autonomous agency, Burkina's AVV, has probably been the most successful institution dealing with land settlement in the OCP countries, the IDA recommendation in favor of line ministries requires some elaboration.

Studies of some of the more successful sponsored settlement projects like Sudan's Gezira, New Halfa and Rahad Schemes; Malaysia's FELDA projects; and Sri Lanka's Accelerated Mahaweli Programme suggest that organizations like the AVV have a comparative advantage over other management types during the early stages of the sponsored settlement process. With strong political support and a highly motivated staff with relatively good conditions of service, such organizations have effectively raised funds, constructed physical and social infrastructure, and introduced new rainfed and irrigated cropping systems.

Yet the experience in West Africa and elsewhere is for such organizations to plan and implement settlement with little involvement of other institutions, and to resist—even after ten years—handing over managerial and other functions to line ministries and local organizations. In each of the examples cited above, the sponsoring agency has resisted handing over major management responsibilities. In cases where responsibilities are handed over, as with

rainfed settlement in Nepal's Terai, line ministries frequently have neither the resources nor the inclination to take over settlement areas outside their existing constituencies.

Tending to be centralized and hierarchical, autonomous settlement organizations would not appear to be well suited for facilitating the type of highly participatory and diversified assisted spontaneous settlement that IDA is recommending, whereby a range of government agencies work together with heterogeneous communities of hosts, settlers, and pastoralists, as well as with NGOs. Furthermore, because of changing priorities, reduced funding, and interagency jealousies, the effectiveness of autonomous agencies is apt to decline with time, so that their very existence may hinder further development.

Because of such weaknesses and of the necessity for strong participatory local organizations and cost-effective organizations of all types, IDA does not recommend autonomous organizations for planning and implementing the development of OCP areas. That does not mean, however, that such organizations should be rejected in all cases. Exceptions might be river basin authorities where dam construction is linked with a broader program of river basin development that includes land settlement, or, under particularly favorable circumstances, a sponsored core settlement area that is associated with a larger program of assisted settlement.

Land settlement success requires planning and management at multiple levels over an extended time. The West African experience demonstrates that the involvement of at least local, government, and donor institutions is essential. Additional contributions can be made by NGOs and international institutions. While IDA believes that existing institutions should be favored over creation of new ones wherever possible, this complexity raises problems of coordination.

Participatory Involvement through Local Institutions

The Importance of Local Participation

Since the key resource in all types of settlement is the local population, their participatory involvement through local institutions is essential. No matter what the size of the financial investment, no matter how great the efficiency of new organizational structures, no matter how powerful

new production technologies may be, successful settlement depends on the cumulative result of decisions made by many settler families. These decisions result from their perceptions of risks, opportunities, and constraints, and the extent to which their potential interests are promoted. Without their interest and commitment, without their empowered participation in planning and implementation, settlement cannot succeed.

The case studies provide ample evidence of instances where governments have approached the settlement process with little apparent regard for hosts', settlers', and pastoralists' perceptions of opportunities and constraints. Government intervention has typically focused on promoting national goals or some combination of national and subnational goals that reflect the interests of other groups or institutions.

The methods that governments have used to attain these goals have taken little account of, and occasionally diverged radically from, the interests and needs of local populations. Examples include governments' acquiring land for settlement without compensation or local consent; accentuating insecurity of tenure among settlers on settlement schemes by confusing issues of access to land with decisions about how the land is to be used; imposing production regimes on settlers that are inflexible, overly risky, and that provide settlers with unsatisfactory returns; and encouraging settlers to invest in expensive inputs for staple crop production while denying them access to production credit.

These interventions have resulted in conflicts among hosts, settlers, and pastoralists over land, and to a variety of responses by inhabitants that run counter to planners' expectations, or that have longer-term, negative consequences for sustainable production. Settlers have, for example, abandoned schemes, neglected irrigated perimeters in favor of rainfed crops, and cut back on input use, with consequences that are negative for production, incomes, and soil fertility.

Such problems can be avoided by involving local populations at all levels of the settlement process: analyzing and identifying problems and possible solutions; planning and implementing specific interventions in response to problem identification and analysis; making management decisions concerning allocation and use of key resources (e.g., capital and land); and monitoring, evaluating, and modifying where necessary, approaches to intervening in the process.

Community formation and the development of participatory organizations among settlers can contribute importantly to settlement success. Evidence from settlement schemes around the world shows that forming water-user associations is the most cost-effective way to manage small-scale irrigation projects. Community-based producers' groups have also shown themselves capable of administering production credit. Examples of successful initiatives of this kind include the local social-action groups in Mali, the *associations villageoises* and the *village tons*, in the area of the *Opération Haute Vallée* (McCorkle 1986), and producers' groups in southern Togo and in Niger. Efforts are also under way to organize producers' groups to manage access to inputs and credit at FED-Agbassa, Togo. Local settler organizations can also help maintain basic infrastructure (roads, schools, health facilities), but for this they will require financial assistance. The effectiveness of local organizations is enhanced if members have basic skills in literacy and numeracy. Development planning should therefore emphasize functional literacy programs wherever the promotion of local organizations is envisioned. Such programs are an especially promising area for NGO involvement.

A Diversity of Local Institutions Needed

Because of different cultural backgrounds of hosts, settlers, and pastoralists, and different habitats and population densities, the nature and effectiveness of local institutions can be expected to vary from area to area, as well as through time in any one area. Nonetheless we can generalize from the results of this review.

Several different levels of local institutions are necessary. Included are local governing institutions at the district, subdistrict, and village levels, the first two levels inevitably including persons other than hosts, pastoralists, and settlers. Effective settlement policies must be integrated with national development policies, and effective local institutions should incorporate host populations, pastoralists, and representatives of service agencies as well as settler households and communities.

One result of the recent emphasis on decentralization is the transfer of decision-making, management, and revenue-collection responsibilities to district officials and district development committees with prominent local citizens and officials

as members. In terms of increased local participation, decentralization makes sense. There are, however, major risks.

One risk is token decentralization. In Ghana, for example, recent university graduates have been assigned to district headquarters as planning officers responsible for designing revenue-generating projects that will enable local government to take over the management of a wider range of social services and infrastructure. On arrival, however, they often find that the major planning decisions are still made at a higher level, and second, that they do not have sufficient "seed capital" to initiate projects. We found rapid declines in morale under these circumstances, jeopardizing not only the decentralization process but also local development. A second risk is that decentralization may stop at the district level rather than reaching further down to the market center, subdistrict, and village levels. This risk is especially applicable to settlement areas that are at a distance, both geographically and in terms of influence, from district centers and that cross district boundaries.

Zimbabwe's Department of National Parks and Wildlife Management learned this lesson during a pioneering revenue-sharing experiment (Operation Windfall) in which revenue received through the culling of elephants was shared with district councils adjacent to national parks and game management areas. Dominated by local elites, the problem was that the councils did not adequately share the revenue received with those communities most at risk from elephant damage. Learning from this experience, and from early attempts to implement a more ambitious and broader Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), the government of Zimbabwe is now emphasizing local involvement more at the subdistrict and village levels.

Initial results from Zimbabwe in the Dande area at the subdistrict level are encouraging (1990 communication from Marshall Murphree), suggesting that highly decentralized revenue sharing in the management—for example—of forest resources, gives villagers a major incentive for protecting, managing, and enhancing those resources. Having followed the Zimbabwe experiments since their initiation nearly ten years ago, IDA believes that they are relevant to issues dealing with decentralization and local institutions in the OCP areas. While such local institutions as district

councils and district development committees must be involved, the major lesson learned from the Zimbabwe experience is that the key institutions are at the subdistrict (in the form of Ward Committees in Zimbabwe) and village levels.

Relating this experience to OCP areas would suggest that the key institution would be the type of community land management association described in the preceding chapter. Composed of hosts, settlers, and pastoralists, these associations would incorporate a number of villages and pastoralists using such geographically defined areas as a portion of a tributary basin. While analogous in many respects to the Land Management Committees formed under Burkina's PNGT program, they would have a stronger legal standing and a wider range of development (as with the ability to receive credit in the case of Mali's Village Associations) and natural resource management functions.

Just as water-user associations are federated to facilitate management at the irrigation project level, so too consideration should be given to federating community land management associations in OCP areas. Such federation will not only provide a channel for resolving conflicts between neighboring associations, but also enable local populations to negotiate with district councils and government agencies from a position of greater strength.

How to Proceed

- At the national level legislation may be needed to provide the necessary legal standing for community land management associations so that, like cooperatives, they can receive credit.
- At the national level it may also be necessary to expand the capacities of the judicial system to hear cases that cannot be adjudicated within community land management associations—in particular cases involving “outsiders,” the state included.
- Start with areas where local people are receptive to such organizations, areas that have more potential for development (in terms of rainfall, soils, willingness of hosts to incorporate settlers and pastoralists, and access to markets), and/or that are adjacent to classified forests or major projects such as dams.
- Involve host populations from the very start as future beneficiaries, using them and their knowledge as a cost-effective mechanism for

mapping vegetation and soil types as a basis for land use planning. Because of their concern about a dwindling resource base for provisioning their livestock, and their willingness to provide herding services to villagers and—at their own pace—to shift toward agropastoralism, it should be relatively easy at the start also to incorporate pastoralists into land management associations. The experience in Burkina Faso, as in the Solenzo and the AVV-UP1 areas, is that pastoralists have willingly cooperated, for example, with zoning efforts. These zoning efforts also seem to have the support of wealthy agriculturalists with large herds.

- To facilitate the incorporation of assisted spontaneous settlers, they should be encouraged to come as clusters of neighbors or related families. This will expedite cooperation among them during the first years in land clearance and housing construction; it will also facilitate the emergence of local leaders for working with host and pastoralist leaders, and stimulate community formation.
- Integrate development and environmental management through zoning. The goal, as with various experiments under the World Bank-assisted village land management program (PNGT) described in the previous chapter, is to zone settlement areas in a way that sets aside land for village sites and other infrastructure, cropping systems, livestock management (including large pastoral zones for transhumant pastoralists as well as zones for agropastoralists), and management of communal resources and natural-resource reserves.
- Ideally, zoning should be completed in the most desirable areas and in the most threatened ones (especially in regard to forest reserves) before the arrival of large numbers of spontaneous settlers. However, as the Rapadama experiment in Burkina Faso illustrates, it is possible to get strong local involvement in planning and implementing zones even when that requires the relocation of spontaneous settlers. In such cases, land consolidation for a wider range of managed uses is being accomplished.
- While the preceding are in the form of recommendations, planners should also consider the extent to which land management associations should be federated, up to the district level and beyond, so as to increase their ability to be heard within district councils and higher-level institutions.

Government Management Structures

The case studies reveal two principal approaches by governments in OCP countries toward providing management structures for OCP-area settlement. The first, which we recommend in most cases, entails organizational units that are part of line ministries (e.g., a ministry of plan). The second approach entails more specialized institutions, like the AVV, that have varying degrees of functional and financial autonomy and operate outside line ministries. The two most successful structures that focused specifically on planning and development of OCP areas are the Burkinabe AVV and the Oncho Unit (*Cellule Oncho*) in Mali. The first was an autonomous organization—precisely the type of parastatal organization that the donor community currently holds in ill-repute, and that IDA recommends against for planning and implementing assisted settlement. The second was located within a line ministry. Both types of organization are analyzed in some detail in sections that follow.

Management Structures Involving Autonomous Agencies

Autonomous management structures can be effective if they have adequate financing, personnel resources, technical capacity, operational linkages with government technical services, and backing from government administration. Though rare, structures that combine these features do exist. At best, however, because of their top-down approach and their predictable aversion to handing over responsibilities to line ministries and local organizations at the appropriate time, such structures are not well suited to assisting spontaneous settlement. Nevertheless, such organizations should not be rejected out of hand, especially where assisted settlement is combined (for example) with sponsored settlement or dam construction.

THE VOLTA VALLEY AUTHORITY (AVV) IN BURKINA FASO. For planning and implementing sponsored settlement, the AVV is the most successful example of an autonomous agency within the OCP countries. In 1974, the AVV was created as an independent agency within the Burkina government's Ministry of Plan, with responsibility for all settlement and development in a territory of about 30,000 km². The AVV's goal was the optimal, conservationist-oriented development of natural resources (soils, forests, pasture, water, and wildlife)

in the underpopulated areas of the Volta Valleys and their major tributaries.

The early AVV was a highly centralized institution that focused on conducting high-quality preliminary surveys for the implementation of sponsored settlements in areas with good agricultural potential. In addition, the project conducted a small number of managed forestry and irrigation projects. By 1979, five years after the planned settlement program started, the AVV was receiving an increasing amount of national and international criticism. Special areas of concern were:

- The high costs of sponsored settlements (estimated at \$12,000-15,000 per settled family in 1978).
- The relatively slow rate at which planned settlement was taking place, only 1,826 households having been settled during the first six years (as opposed to the 9,700 to 13,700 anticipated) (Murphy and Sprey 1980:76).
- Conflicts caused by AVV projects with some of the indigenous inhabitants of the valleys.
- Inattention to the much higher rates of spontaneous immigration by agriculturalists and pastoralists onto project and adjacent lands.

In 1982, the AVV underwent a major reorganization in an attempt to develop a more flexible administrative structure and development program. This reorganization was part of a broader shift of the AVV away from its earlier focus on planned settlement, to a new emphasis on seeing the river basins as only one of many resources that needed to be mobilized to promote regional development. The more broadly defined strategy was to include the indigenous inhabitants, spontaneous settlers, and pastoralists, as well as sponsored settlers.

Under the new structure, the administrative functions of the AVV were divided into two levels. The AVV headquarters in Ouagadougou retained control over central administration, planning, coordination, and support services. The administration of specific projects, however, was decentralized. Special projects fell into two categories. The first category included integrated regional development projects that focused their activities on the river basins as well as on the surrounding areas of existing settlement. The second category of project involved the design and implementation of smaller, more specialized projects like pilot irrigation schemes, pastoral zones, and industrial forests.

While this reorganization has resulted in some major advances, including incorporation of hosts, spontaneous settlers and pastoralists with sponsored settlers, and early experimentation with what is now called the PNGT approach through land management committees, it also created a separate regional development authority in conflict with, and duplicating the functions of, a wide range of line ministries. Currently the AVV is being reorganized a third time to play a much smaller planning and implementation role that is closer to the type of organization recommended by IDA and more in tune with donor funding for institutional development. In the process such responsibilities as extension, credit, training, and rural cooperative development will be handed over to the appropriate line ministries. The newly reorganized AVV (*Office national d'étude et d'aménagement des terroirs-ONAT*) will serve as a research and implementation agency attached to the Ministry of Agriculture and Livestock and will consult with the national village land management program (PNGT) as well as with ministries, in the design, early implementation, and evaluation of village land use planning. The AVV's vast experience in land use planning for crop, agropastoral, and forestry projects, as well as its extensive experience in conducting the type of hydrologic, soil, agricultural, and social surveys that we are advocating, will thus be retained.

THE MANANTALI RESETTLEMENT PROJECT IN MALI. Another example of an autonomous organization is Mali's *Projet pour la Réinstallation des Populations de Manantali* (PRM) that was established to plan and implement the resettlement of approximately 10,000 people whose villages and fields would be flooded during the late 1980s by waters rising behind the recently completed Manantali Dam. Better funded, and with more personnel and transport than line ministries working in the area, it did an acceptable job in physically removing the people and in providing new village infrastructure, including potable water supplies.

In Koenig's opinion, however, such better-funded autonomous agencies as PRM "saw the initiative of the existing local government administration." In the Manantali case, while local development agencies had the knowledge, "they saw that PRM had much greater financing than they did, so they decided to let PRM do the work" (personal communication, April 1990). PRM's

task, however, was only the physical relocation of the people; not their rehabilitation and development. Now that resettlement is complete and PRM's job finished, it remains to be seen whether the line ministries and other local institutions have the resources and inclination to plan and implement the development of the resettled population and the surrounding area.

Management Structures within Government Line Ministries

THE ONCHO UNIT IN MALI. The *Cellule de Planification et de Programmation du Développement des Zones Libérées de l'Onchocercose* (Cellule Oncho or Oncho Unit), which is part of Mali's Ministry of Plan, is an example of the type of government institutional structure that IDA recommends. The unit, created in 1982 and operated until 1987 with FAO funding, was Mali's response to an OCP-wide strategy of organizing national-level capacity for data bases and OCP zone planning. The unit also reflected government policies of promoting grass-roots development and transferring financial and planning responsibilities to local levels. In contrast to existing rural development structures in Mali (e.g., CMDT), the Oncho Unit focused on grass-roots development efforts, and successfully linked local groups having ideas for settlement assistance projects with sources of funding.

Typically, the Oncho Unit helped local groups prepare project proposals and locate financial support. Once funding was located (funders were responsible for implementation), the unit provided backup in the form of monitoring and evaluation. The unit's expertise in settlement became such that it was asked to provide assistance to projects outside the OCP area. FAO funding for the unit terminated in 1987, at which time its planning functions were absorbed by the Ministry of Plan and by regional and local development committees composed of representatives from the administration, government technical services, and the party, the latter representing local residents.

The timing of the transfer of funding from donors to the national governments, and of the transfer of responsibilities from government institutions to line ministries and decentralized agencies, is critical to the ability and willingness of receiving organizations to follow through. In this case it would appear that termination of FAO

funding was premature, the development of suitable institutions for settlement planning—like land settlements themselves—requiring a longer time span than five years.

Focused organizational structures like the Oncho Unit can assist settlement. Their strengths reside in their capacity to develop a corpus of knowledge based on experience and a flexible approach to settlement assistance. Integrating the functions of such specialized units within a line ministry avoids a proliferation of planning units, which can be particularly problematic when their external funding is in doubt. The need for subsequent settlement planning, once such units are absorbed by line ministries, may result, however, in additional staff without firsthand experience being assigned to some regional and local development committees. One approach to forestalling this potential problem and capitalizing on the accumulated experience of former Oncho Unit staff would have them provide training and backstopping for local-level organizations and for government staff assigned to work with such organizations.

EAUX ET FORÊTS IN MALI. Mali's Direction Nationale des *Eaux et Forêts* (E&F), which is part of the Ministry of National Resources and Livestock Production, contrasts sharply with the Oncho Unit. The Mali government has involved E&F in local-level development endeavors, including village land management committees (*Gestion de Territoire Villageois* [GTVs]). Unfortunately, a fundamental clash exists between this development role and local perceptions of E&F as a police agency rather than a development agency. The organization has a dual and contradictory mandate. Like other policing agencies, E&F has developed an intervention style over the years that does not fit well with efforts to promote local responsibility and participation.

The two examples from Mali point out that efficacy of government settlement assistance can be influenced by organizational locus, competency, organizational coherence, compatibility of mandates, and intervention style.

CELLULE DE COORDINATION IN BURKINA FASO. Described briefly in Chapter 11, the *Cellule de Coordination* was created in 1986 as a national coordinating unit within Burkina's Ministry of Plan to help line ministries plan and implement PNGTV-type pilot projects. With funding from several donors, this unit has provided planning assistance for the conceptualization of pilot projects, and for

monitoring those projects in order to build their experience into future program guidelines.

THE NATIONAL ONCHOCERCIASIS SECRETARIAT IN GHANA. Ghana provides an example of a weak planning unit within a line ministry. The National Onchocerciasis Secretariat (NOS) was created in 1974 as part of the Ministry of Finance and Economic Planning, to coordinate, plan, and implement development interventions in Ghana's OCP areas. The NOS has been plagued by planning and operational problems since its creation. It has suffered from recurrent financial shortages, and at present has no budget line for research and planning. The staff has been cut by almost 75 percent. The NOS head offices are located in Accra, about 800 kilometers to the south of OCP areas; consequently, NOS staff are rarely present in the OCP areas. Finally, the NOS lacks operational linkages with government agencies and departments for intervention in the OCP areas.

These factors have resulted in prolonged NOS planning efforts with negligible results in the targeted ("project") areas of the Fumbisi Valley and "Overseas," and in other, apparently lower-priority OCP areas (Red Volta and Black Volta Valley areas). The organizational structure of NOS, which appears very ill-suited for on-site planning, implementation, and monitoring, combined with severe cutbacks in financial and personnel resources and a lack of articulation with regional technical services, have severely compromised its effectiveness.

The evidence suggests that a thoroughgoing restructuring is necessary to make the NOS effective. While NOS incorporation in a government ministry offers the promise of harmonizing national and NOS plans and objectives, NOS or its equivalent must be able to tailor interventions to the needs and possibilities of the OCP areas. This requires an agency presence in the OCP areas that does not currently exist.

How to Proceed

As with land tenure, there is no simple answer as to which type of management structure is best, with the nature of "best" varying according to the type of settlement and the nature of national bureaucracies. However, for programs that emphasize assisted spontaneous settlement, the West African experience suggests that the best approach is to use line ministries as opposed to more autonomous institutions. There are a num-

ber of reasons for this conclusion. Besides being a better use of resources (as opposed to setting up new institutions that are apt to be costly and competitive with old ones), line ministries have a better record in working with local organizations and NGOs.

The use of more autonomous organizations presents the problem of eventually handing over responsibilities to line ministries and other agencies. Organizations like the AVV and PRM tend to resist handing over, for doing so weakens their influence. At the same time, overburdened line ministries and other agencies may hesitate to assume responsibility for projects or project components that are associated with new constituencies. Both problems were identified with PRM in Mali.

Planning for overall OCP area development, therefore, should usually be a function of the ministry of plan or its equivalent, while sectoral planning and provision of extension staff would be the responsibility of the relevant ministry of rural development, agriculture, animal husbandry, or water and forests. Because settlement involves areas where government services are weak, budgets, personnel, and equipment will have to be increased. This will require financial assistance from donors. In some instances, new units may be needed. A case in point would be departments of water and forests where personnel, in the eyes of local populations, are associated with policing functions. In such cases a new unit of development foresters might have to be added.

IDA recommends that small, adequately staffed, equipped, and financed planning, monitoring, and evaluation units be considered within planning ministries for those countries with major opportunities for OCP area development. These units must have adequate financial backing, unambiguous authority within the ministry, and a clear-cut mandate to coordinate as well as plan actions in OCP settlement areas, especially given the generally weak, horizontal operational linkages among those African ministries concerned with rural development. Overcoming these structural obstacles is essential for effective development planning in OCP areas. These units would also serve as liaisons with international institutions like the OCP (as does the NOS). Implementation would be the responsibility of line ministries, NGOs, and local organizations.

Donors

Because the development of OCP areas requires expanding government policies to new lands, additional funds and technical assistance are required from both donors and NGOs. Two types of assistance are needed. One is sharply targeted at particular priorities or constraints; the other, such as donor funding for socioeconomic development, requires allocation of funds over an extended time period.

The implementation of a successful program of land settlement cannot be achieved within a five-to-ten-year period. For this reason such programs are especially vulnerable to two characteristics of donor policies: their short time horizon (with project cycles rarely lasting over five years) and the tendency (of bilateral donors in particular) to shift priorities in response to changes in domestic conditions and in borrower policies. Both characteristics can jeopardize land settlement programs by reducing or withdrawing funds at critical times during the settlement process.

Socioeconomic development of the OCP areas requires the same kind of international approach by governments and donors that currently characterizes the vector control program. While governments can create a favorable environment by an international approach—for example, to inter-country migration and pricing policies—donors can create an enabling environment through a long-term commitment to financial assistance for socioeconomic development. Though the opportunity existed in the 1970s when UNDP made funds available to each country for socioeconomic planning, both multilateral and bilateral donors have been slow to focus on the development of OCP areas. Now is the time for the donors to make the same sort of commitment to socioeconomic development that they made to vector control. Otherwise, the opportunity presented by the vector control program will be lost—at considerable cost to the eleven countries since the OCP areas include some of their most favorable habitats.

Donor assistance can serve three functions. One type of assistance will be needed to develop an appropriate international institutional mechanism for helping the eleven countries formulate policies and plans for the OCP river basins, and to monitor plan implementation. A second type will be needed to support programmatic approaches such as the FAO-assisted Onchocerciasis Unit in Mali or the World Bank-assisted village land

management program that is applicable in OCP areas throughout the eleven countries. A third type will be needed to facilitate the development of specific settlement areas. Though an obvious need relates to financial assistance for such infrastructure as roads, bridges, and boreholes, less obvious, but equally important, is financial assistance to local organizations at the district, settlement-area and village levels. Because of the difficulty of channeling such funds through central treasuries, this is one area where cooperation between governments, donors, and NGOs is attractive, with donor funds channeled through NGOs.

As with government and NGO assistance, donor assistance should heed the various stages of the settlement process. During the planning phase, one example would be funding of aerial photography, which can subsequently be used by local communities for zoning purposes and correction of environmental degradation. This approach, which is being used successfully in the Mossi Plateau in Burkina Faso, is also very promising for attempts to plan land management in settlement areas such as the Mo Plain in Togo. For smaller areas, innovative and less expensive approaches are possible, such as the use of video imagery by the University of Arizona within the Senegal River Basin. During the implementation phase examples have already been given relating to land use planning, local institution building, and provision of physical infrastructure. Focusing on stages, of course, should not preclude some assistance throughout the settlement process, especially in regard to institution building and training at the national level.

Nongovernment Organizations

Because settlement involves the occupation and development of underpopulated and problem-prone areas, it is likely that governments will not have the institutional capacity, the personnel, the equipment, or the funds to provide appropriate assistance when and where needed. NGOs have skills and resources that can complement those of settlers and government agencies. Their involvement, like greater reliance on the initiative and local organizations of settlers, is also an effective way to reduce financial costs to government.

Though relief and development need to be mixed in some contexts, NGO involvement should emphasize economic, institution-

building, and training activities rather than humanitarian ones. Such involvement is best targeted at specific interventions at all stages of the development process, rather than sustained involvement over many years. While that conclusion is partly based on the more limited capability of most NGOs, it is also intended to reduce the risk of local people becoming too dependent on NGO assistance.

During the planning stage, NGOs can assist with land use planning in both sending and receiving areas, as illustrated by PATECORE's success in working with local communities on the Mossi Plateau—in that case using aerial photographs financed through donor assistance. NGOs can also complement government extension personnel during the initial settlement stage by providing orientation to new settlers. Such orientation should cover three general topics. These are management of the natural resource base, economic development, and community formation, with all three directed at environmentally viable production systems and participatory management of the resource base.

Though no cases were found where NGOs have replicated the type of broad orientation that has proved effective in Latin America, they have provided assistance during the early years of settlement. In Ghana, Global 2000 has helped low-income settlers by advancing them fertilizer, with repayment in grain deferred until after the harvest. It has also supplemented overburdened local extension services by undertaking on-farm demonstration.

In Mali, a number of national and international NGOs have helped settlers from the Dogon area as well as Soninke repatriated from France. According to Koenig, "their role was more of helping people to obtain the material goods necessary to survive through their first year. In the case of the Soninke, who had been factory workers for years, the NGO helped them get agricultural training. NGOs facilitated the incorporation of people into the milieu and expedited the distribution of food aid over the first year or so of settlement" (personal communication, April 1990). Food distribution is a tricky undertaking because of the risk of undercutting settler initiative. Although it may be necessary in some cases (especially with respect to sponsored settlement and settlement based on repatriation), food aid should—except for the elderly and incapacitated—be tied to productive activities, as is done in food-for-work programs.

During all stages of the settlement process NGOs can also provide social infrastructure as well as physical infrastructure (for potable water supplies in particular). In Ghana, for example, Akwabi-Ameyaw found at Damongo that a major hospital built by the Catholic Church has attracted settlers. Elsewhere in Ghana, the Catholic Relief Service has assisted villagers relocated in connection with the construction of the Volta Dam at Akosombo to exploit the productivity of the reservoir drawdown area more effectively. Many other examples could be given.

International Institutions

IDA believes there is a special need for two types of international institutions to improve the planning and implementation of land settlement. The first type of institution would provide information on lessons learned, on appropriate planning and implementation procedures, and on monitoring and evaluation. Such information would cover what has worked and why, as well as low-cost, state-of-the-art, appraisal, monitoring, and evaluation techniques that actively involve local populations (one example being participatory rural appraisal as used in Kenya). Information would be passed on to the relevant planning unit in each of the eleven countries, with information dissemination and assessment of that information also involving periodic workshops in member countries that include local leaders and NGOs as well. Information would also be supplied to donors, the intention being to encourage a more efficient allocation of funds to the eleven countries.

On the basis of lessons learned during the Land Settlement Review, IDA has recommended guidelines which, with some modification, appear applicable to each of the eleven OCP countries. We believe that the implementation of these guidelines will be facilitated by an international institution that has the capacity, personnel, and funding to provide assistance over an extended period. In the absence of such an institution, which we believe should be based in one of the OCP countries, the danger increases that national governments and donors will approach the socioeconomic development opportunities provided by the successful vector control program in a piecemeal fashion. Not only will this jeopardize the implementation of successful land settlement programs, but it will also place at risk the river basins themselves and host populations since vector

control has increased, or will increase, the spontaneous movement of people into those river basins.

More favorable habitats because of vector control, the OCP river basins, in a sense, are the last frontier in a number of countries. Against a national background of poverty, population increase, and environmental degradation, the implications of such a situation must continually be kept in mind. Without appropriate policies and plans for implementing and monitoring government and NGO-assisted spontaneous settlement, IDA predicts accelerating environmental degradation and increasing conflict in the OCP river basins as well. This prediction is why socioeconomic development requires the same type of sustained national and international effort that continues to characterize the vector control program, but has yet to support development efforts. As with vector control, so an international institution is required to facilitate socioeconomic development.

The second type of international institution would have a more limited, but nonetheless critical, research function that would relate to developing viable production systems for OCP areas, with special emphasis on areas with less than 800 mm rainfall. The most critical need here relates to the cropping and livestock management components of the production system, since the general consensus is that an environmentally sustainable system has yet to be devised for intensified agriculture in areas north of the 800 mm isohyet.

Relevant would be FAO's Farming Systems Development Programme (FSD), as well as such international institutions of tropical agriculture as IITA and ICRISAT, which already have relevant crop breeding programs, provided research is articulated through national research stations to farming households.

Research and Monitoring

Research

While enough is known about the experience with land settlement in the OCP countries to generate operational guidelines for development, a number of topics need further research. Because IDA emphasizes local participation and diversified production systems, collaboration between disciplines is necessary, especially collaboration between agricultural scientists and social scientists. Research also requires collaboration

between national and international research institutions.

Research is needed on the pace and impact of settlement on land and other natural resources in OCP areas, in part to establish a baseline from which to carry out monitoring of the settlement process; in part to develop a better understanding of the dynamics of settlement and natural resource use and management at the household level.

Land tenure is a very important issue in settlement areas, but our understanding of change and continuity in tenure relations is insufficient. Research is needed on tenure relations in the major settlement areas, and on the impact of settlement and national land legislation on them. Research is also needed on indigenous knowledge relating to soils, vegetation, and other aspects of the natural resource base, the use of which will expedite cost-effective mapping and zoning.

At the level of community participation, further information is needed on the type of incentives required to gain host participation and to stimulate households to make investments, as in conservation, with a delayed payoff. To help provide communities with income for covering recurrent expenditures, research is needed on appropriate business enterprises and on how to capitalize them. Research is also needed on how best to tie community institutions into institutions at district and higher levels in such a way that they are able to compete for their share of available resources.

As incomes go up, research is needed on settler investment strategies. Though IDA researchers were told that successful settlers are apt to invest in the sending areas, the extent, nature, and importance of such investment is unknown. Also unknown are the types of social and political linkages that settlers maintain with sending areas.

In regard to settler production systems, research is needed on breeding drought- and disease-resistant, early maturing varieties of the major food crops, on cross zone introductions of existing cultivars that already have such characteristics, and on integration of cropping systems, livestock, and off-farm activities into more sustainable and profitable production systems. Research is also needed on cash crops for low rainfall areas, and in higher rainfall areas to complement cotton. While cotton cultivation has enabled settlers in a number of OCP countries to raise their living standards, dependence on one

cash crop is risky in the face of competition from other countries (China for example).

Further research should also assess appropriate nonfarm activities and the types of national policies and local or regional interventions that might facilitate their development, their profitability, their relationship to and impact upon farm activities, their appropriate phasing, and government incentives for their development. Research is also needed to identify appropriate agroindustries as well as to provide recommendations on their scale and financing. As with other recommendations in this report, the starting point should be processing activities people already do, such as village and market brewing, and preparation of various food products, which are important means for redistributing income from men to women.

How best to coordinate NGO activities and to establish an international institution to facilitate socioeconomic development also require study. The formulation of appropriate indexes for longitudinal monitoring of the impacts of settlement on production, living standards, and the environment need study as well.

Monitoring

Because of the dynamics of the settlement process, any monitoring that is timely to planners will strongly pay off.

For more efficient and cost-effective monitoring for planning purposes, a relatively small but properly stratified sample (if no other surveys are undertaken) or subsample (of broader surveys) could be selected for annual interviewing. Data analysis and feedback into planning is very difficult, as well as costly in terms of personnel, time, and funds, with respect to large sample surveys where the intention is to repeat them over an extended time period. Although still controversial, a very different approach is gaining acceptance for monitoring changes in living standards. This entails the annual monitoring of a relatively small number of carefully selected households (50, for example) in regard to a number of indicators, including indicators relating to income and expenditures, and changes in equipment used for productive purposes, in housing and household furnishing, in fuel and lighting, and in domestic water supplies and waste disposal facilities. Other indicators can be developed to monitor environmental impacts.

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Annex 1. List of Land Settlement Review Documents

Reports Of Case And Comparative Studies

Case Studies

Burkina Faso

McMillan, Della. 1989. Draft Country Case Study: Burkina Faso. December. (Analysis of Material from Site Reports and Other Research at AVV-UP1, Komienga, Solenzo, and Niangoloko).

McMillan, Della, Jean Baptiste Nana, and Kimseyinga Savadogo. 1990. Land Settlement Review, Country Case Study: Burkina Faso. Binghamton, NY: Institute for Development Anthropology. July.

Ghana

Akwabi-Ameyaw, Kofi and Della McMillan. 1990. Land Settlement Review, Country Case Study: Ghana. Binghamton, NY: Institute for Development Anthropology. July.

Mali

Koenig, Dolores. 1990. Land Settlement Review, Country Case Study: Mali. Binghamton, NY: Institute for Development Anthropology. July.

Togo

Painter, Thomas M. 1990. Land Settlement Review, Country Case Study: Togo. Binghamton, NY: Institute for Development Anthropology. July.

Seven Country Study

Buursink, John, with Thomas M. Painter. 1990. Land Settlement Review, A Review of Settlement Experiences in: Benin, Côte d'Ivoire, Guinea, Guinea-Bissau, Niger, Senegal, and Sierra Leone. (Seven Country Review.) Binghamton, NY: Institute for Development Anthropology. July.

Site Reports

Burkina Faso

Savadogo, Kimseyinga. 1989a. Analysis of Off-Farm Income. September.*

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Niangoloko Site and the Toumousseni Forest Reserve).*

——— 1989c. Rapport sur le Site. Programme PGTV Rapadama. (English version: 1989 Site Report PGTV Rapadama).*

——— 1989d. Enquête Ressources Naturelles de la Zone de Niangoloko.*

——— 1989e. Enquête Ressources Naturelles dans le Sous-secteur de Solenzo.*

Other Burkina Faso Field Reports

Sawadogo, Sommaila. 1989. Enquête sur les Départements: AVV Mogtedo et Mogtedo-Bombore. Août.*

Frederic, Guira. 1989. Historique du Marché du Linoghin.*

Ouedraogo, Tinga. 1989. Historique des Marchés Fréquentés par les Paysans AVV à Mogtedo et Mogtedo-Bombore.*

CRPA du Mouhoun, Service Suivi-évaluation. 1990. Carte et Activités des Marchés de la Sous-secteur de Solenzo. Avril.*

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Site Reports

Ghana

No individual site reports were prepared for the Ghana case study.

Mali

Diarra, Ousmane. 1989. Rapport de Site, Dioila, Mali. Binghamton, NY: Institute for Development Anthropology. August.

Diarra, Tieman, and Simaga Halimata Konaté. 1989. Rapport de Site, Yanfolila, Mali. Binghamton, NY: Institute for Development Anthropology. August.

Fofana, Makan, and Simaga Halimata Konaté. 1989. Rapport de Site, Silingué, Mali. Binghamton, NY: Institute for Development Anthropology. August.

Koenig, Dolores. 1990b. Site Report: Manantali, Mali. Binghamton, NY: Institute for Development Anthropology.

Kone, Felix, and Maiga Fatoumata Maiga. 1989. Rapport de Site: Finkolo, Mali. Bamako: Institut des Sciences Humaines.

Sow, Moussa. 1989. Rapport de Site, Tienfala, Mali. Binghamton, NY: Institute for Development Anthropology. August.

Togo

Kedagni, Sédégnan. 1989a. Etude sur l'Installation des Populations au Togo: Migration Spontanée dans la Plaine du Mô. Lomé: Institute for Development Anthropology. Juin.

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Kenkou, Gnari Kossi. 1989. Etude sur l'Installation des Populations dans les Zones Libérées de l'Onchocercose. Site de FED-Agbassa, Région de la Kara au Togo. Lomé: Institute for Development Anthropology. Juillet.

Annex 2. Methodology

Introduction

In the Terms of Reference for the Land Settlement Review, Figure 1 on Methodology and Work Plan distinguished between intensive case studies in Burkina Faso, Ghana, Mali, and Togo, and a review of the settlement experience in the seven other OCP countries. In the belief that the best strategy for obtaining a clearer understanding of experience with land settlement in West Africa, and for distilling operational guidelines from that experience, was to obtain detailed analyses of specific settlement areas, IDA placed special emphasis on the four intensive case studies. We are convinced that the analysis presented in the Final Report fully justifies this approach.

The methodologies used during the four case studies are described in the sections that follow. For the reasons mentioned in the text, namely, more emphasis on land settlement as a major government strategy and the availability of time series data, special attention is given to the methodology used in Burkina Faso. While field research started in the other three countries during 1989, it was initiated in Burkina in December 1988, in part to allow pretesting of questionnaires and other methodologies for comparative use elsewhere. As for the seven other countries, short field trips were made to five of them by John Buursink and to Côte d'Ivoire by Thomas Painter.

Burkina Faso

The Burkina case study research was designed and implemented by three senior team members. Kimse Savadogo, Department of Economics, University of Ouagadougou, was responsible for the design, testing, and analysis of the economic questionnaires at all four study sites (Savadogo 1989 a, b, c, d; Savadogo, Sanders and McMillan 1989), as well as for drafting sections on farming systems and diversification for the final report. Jean Baptiste Nana, Sociologist, CEARD (*Cabinet d'Etudes d'Appui et de Recherches pour le Développement*), was responsible for coordinating research at the Niangoloko, Solenzo, and AVV Rapadama Study sites (Nana 1989 a, b, c, d, e). Della McMillan, Anthropologist, IDA, was responsible for the overall coordination of research and analysis as well as for research in the AVV planned settlements at Mogtedo, Mogtedo-Bombore, and Linoghin, and spontaneous new land settlement at Kompienga. McMillan was also responsible for pulling together the first draft of the country case study report based on the site reports, sector analyses, and other research conducted by the team (see McMillan 1989). Once the Final Report (McMillan, Painter and Scudder 1990) was completed, the entire team collaborated on a major rewrite (McMillan, Nana and Savadogo 1990). To facilitate comparisons between the case study and the final report, the team followed the same chapter structure.

The Burkina case study is based on a mixture of quantitative and qualitative research at the four

study sites, as well as a series of complementary special studies on market systems, gold mining, the agropastoralist zone at Gadeghin, settler turnover in the AVV sponsored settlements, and local and national institutions. Village-level research focused on a smaller group of sample farmers who were visited consistently over a three-to-eight-month period (the length of the fieldwork differed at the different study sites). It was considered that the trust inspired over time improved the quality of the answers received. The sample sizes used in different surveys are described in Table A.1.

Interviews with study farmers revolved around, but were in no way restricted to, four surveys: (1) a series of land use and farming systems surveys; (2) a series of structured interviews with the women included in the farming systems survey about their attitudes toward the project; (3) a survey of natural resource issues; and (4) a social survey of past immigration history and social integration with different area groups.

Core Methodology at the Different Study Sites

The Land Use, Natural Resource, and Farming Systems Surveys. Information on the income, land use, equity, and environmental effects of settlement-related development at each site was drawn from four interrelated land use and farming systems surveys.

- **General Farming Systems Survey.** A total of 141 households were included in a farming systems survey at three of the study sites (Table A.1). The survey included a stratified random sample of 27 animal traction and manual farmers in two study villages at Solenzo and all (9) of the tractor-owning households in the two villages for a total of 36 households; a random sample of 60 of the 144 households that were included in the 1979 farm monitoring program of the AVV Statistical Service (Murphy and Sprey 1980) in the AVV planned settlements at Mogtedo, Mogtedo-Bombore, and Linoghin (114 of the original 144 are still

living there; see Table A.2); 20 households that have been included in an intensive longitudinal case study of 20 households in a single planned settlement at Mogtedo (McMillan 1983); and a stratified sample from the major ethnic groups in the town of Kompienga. Interviews were conducted with the male household head concerning crop production techniques, labor utilization, and inputs on the fields worked collectively by all members of the household. Each family member was also interviewed about crop production on his or her private fields. The male household head and one wife, usually the wife who was considered to have the largest private crop area or most active involvement in off-farm employment, were interviewed concerning production techniques, input use, and harvests for their private fields; livestock ownership, expenses, and sales; crop sales; and income from nonagricultural sources. Rough estimates of field size (measuring length and width) were conducted, and were verified with more precise measurements of a subsample of fields at Mogtedo V3, Solenzo, and Kompienga. A smaller number of fields was measured for the 60 farmers in the Statistical Service Restudy. Each family was visited from three to five times, or even more, over several months between December 1988 and July 1989 at Kompienga, between February and July 1988 at the AVV, and between March and May at Solenzo.

- **Analysis of Expenditures and Revenues.** A subsample of 54 farm families in the Farming Systems Survey were selected for a more detailed analysis of household expenditures and revenues. In contrast to the Farming Systems Survey, each member of the family was interviewed concerning crop, livestock, and off-farm production. In addition, each family member was interviewed about expenditures for different categories of objects and services for the preceding month and for certain large expenditures (house repairs, bicycles, etc.) for the preceding year.

Table A.1 Sample Size of the Economic Surveys Conducted in Burkina Faso, 1988-89: Number of Households

Site	Farming	Systems	Survey	Revenues and Expenditures	Pastoralists
Solenzo	Daboura	Dar/Kie	All	F.S.^a	New^b
Manual	7	6	13	4	
Animal	6	8	14	5	
Tractor	4	5	9	3	
ALL	17	19	36	12	
AVV-UP1					
Restudy of the 1979 Statistical Service Survey					
AVV-Linoghin —	—	20	10 ^c		
AVV-Mogtedo	—	—	20	5	
AVV-Mogtedo-Bombore	—	—	20	4	4
ALL	60	19	4		
Restudy of the Longitudinal Case Study at V3 Mogtedo					
	20	14	3		
Assisted Settlement Program Rapadama					
	6				
Kompienga (town)					
Former AVV Mossi Settlers	7	5			
Mossi Settlers, non-AVV	6	2			
Yana	6	2			
Gourmantche	6	2			
Ful Be (pastoralists)	3				
ALL	25	11			
Special Studies of Pastoralists					
Kompienga	10				
Mogtedo V3	10				
Gadeghin	10				

^a Subsample of the Sample Households included in the Farming Systems Survey.

^b New Households, not included in the Farming Systems Survey but included for other reasons, including long-term familiarity with the research.

^c At Linoghin, 10 households were included in the revenue study, but only 4 in the expenditure survey. The decision to augment the size of the revenue sample was made because of evidence of a high level of off-farm employment at the site.

Table A.2 Follow-up of Farmers Included in the 1979 Statistical Service Survey

AVV Planned Settlement Bloc/UD	1979	Changes Since 1979				1989 ^a
	Families	Left Project	Deceased	Expelled	Replaced by family members	Total number of families who remain
Linoghin	48	3	4	—	4	45
Mogtedo	72	24	3	—	1	46
Bombore	24	1	—	—	—	23
Bane	48	2	4	2	1	41
Kaibo-Sud	72	20	1	2	—	49
Kaibo-Nord	48	7	—	—	—	41
Total	312 ^b	57	12	4	6	245

^a If the male household head was replaced by a member of his extended family, the family is counted as still being there.

^b We could locate only 96 of the original 97 families in the original sample at Mogtedo

Source: Guira, DEPC, AVV, September 1989.

Four additional households in Mogtedo-Bombore, with whom McMillan had worked since 1978, were included in this research. Three additional households, with large herds, at Mogtedo V3 were also included. The reason for their inclusion was to offset the bias in the farming systems and revenue/expenditure survey that resulted from the fact that a large portion of the wealthiest settler households in the longitudinal case study had migrated out of the village in 1988. Six farm families that had been newly incorporated into the assisted settlement program at Rapadama and three pastoralist families at Kompienga were also interviewed.

This survey included a survey of price changes between 1979 in the major products that, according to our interviews, were most frequently purchased by the farm families.

- **Special Economic Surveys of Pastoralist Production Systems.** Thirty pastoral families (defined as the unit residing together at a permanent camp under the leadership of one individual) were interviewed at three sites—pastoralists living in the area immediately outside of the town of Kompienga, pastoralists working as herders in the area around the AVV planned settlements at Mogtedo, and ten pastoralist families in each of three sectors in the agropastoral zone at Gadeghin. Each individual in the family was interviewed about the number of animals he or she owned, animal losses due to theft or death during the preceding five years, sales of animals and

animal products during the preceding years, cash expenses for livestock production, and other income-earning sources. As at the other sites, the interviews took place over an extended period of time in order for us to adjust to fluctuations in residential patterns and for them to get better acquainted with us. The major exception was at Gadeghin, where the interviews were conducted over a two-week period but where several of the pastoralists had known the individual conducting the interview for 10-15 years. At Kompienga and Gadeghin, the families who were interviewed came from groups that the pastoralists themselves had identified as wealthy, average, and poor. Three of the ten pastoralist families interviewed at Kompienga—one from each of these groups—were included in the revenue and expenditure survey.

- **Survey of Local Markets and Services.** A fourth set of surveys focused on the impact of new lands settlement on the development of local and regional markets and services. These interviews were conducted at Kompienga town; in markets frequented by settlers living in the AVV planned settlements at Mogtedo, Linoghin, and Mogtedo-Bombore; for Niangoloko town; and for all markets in the Solenzo subsector.

Special Issues Related to Women. To complement the information on women, information was gathered on women's perceptions about their situation at the sites as compared to their situation before coming to the project. These interviews

were conducted at each of the sites with the woman who was included in the farming systems survey. Like the immigration survey, they were generally open-ended interviews, conducted in conjunction with the farming systems survey, but reported onto a standard form in order to get comparable data.

Natural Resource Issues. Village migrant and host leaders, as well as a few key informants from the other surveys, were chosen for open-ended interviews on natural resource issues, following a questionnaire format designed by J. Buursink. Informants were asked questions about land use patterns before large-scale immigration, current land use issues, and their projections for the future.

Migration Patterns and Social Processes

- **Extensive Immigration Survey.** Three of the study sites (Kompienga town, Niangoloko, and Solenzo) lacked basic information on immigration trends. At Niangoloko and Solenzo interviews with village migrant and host leaders were conducted in order to count the number of migrant households, their approximate size, their prefecture of origin, and the period when they immigrated. These interviews were often verified by interviews with the male household heads who were identified in the survey. The town census of Kompienga gathered similar data on each of the identified household heads (male and female) living in the town in August 1989.

- **Individual Open-ended Interviews on Migration Histories and Social Integration.** A series of open-ended interviews with household heads in the main study sample was conducted (Table A.2) about their past immigration histories and their relationships with other groups in the new immigration areas. In order to ensure comparability, the interviews were reported on a standard form.

Organization of Research at AVV Study Sites Where Restudies Were Taken

The AVV-UP1

- **Assisted Settlement Project at Rapadama.** The case study of the UP1 assisted settlement program at Rapadama examines the early economic and social results of this experimental assisted settlement project at the end of its first year. Research focused on discussions with the village land management committees, extension agents, and participating settlers. The initial 1987 census

of spontaneous settlers who were surveyed for inclusion in the program provided the basis for a follow-up study to determine how many of these settlers actually remained at the new site, and their level of participation in extension programs. Six settlers considered to represent new settlers participating in the program were included in the study of household expenses and revenues.

- **Planned Settlements at Mogtedo, Linoghin, and Mogtedo-Bombore.** Research in the AVV planned settlements focused on a restudy of sample farmers who were included in an AVV-wide farm monitoring survey during the 1978 and 1979 agricultural seasons. The baseline survey covered 313 households that were randomly chosen in all the major AVV village groups in existence at the time (97 of the 313 households were in the contiguous blocs of Mogtedo and Mogtedo-Bombore; 48 of the study households were from Linoghin). At the time of the study, the sample settlers had been living at the project for periods of one to five years. The farm monitoring survey gathered basic information on crop technology, production, and income for the four 1.5-hectare bush fields (or, in the case of a very large family, four 3.0-hectare bush fields) and 1- or 2-hectare house sites. The results of the farm monitoring survey for 1978 and 1979, discussed in Murphy and Sprey (1980), are analyzed for farmers living at the project for different lengths of time as well as by size of family labor force.

Twenty-seven of the 96 sample families that were included in the 1979 Statistical Service Survey of the blocs of Mogtedo and Bombore, and 3 of the 48 sample families at Linoghin, had left the project and had not been replaced by family members (Table A.2). A random sample of 60 of the 114 remaining households was chosen for inclusion in a multiple-interview economic survey (Table A.2). The goal of the economic survey was to compare the settlers' patterns of social and economic organization today (10 to 15 years after arrival at the site) with what had been observed in 1979 after they had been living at the site for periods of 1 to 5 years. The 1979 farm monitoring survey and the extensive records kept by the AVV extension agents were an unusual and valuable resource that enabled us to assess specific patterns of longitudinal change.

A second source of baseline information included a more intensive, longitudinal case study of settlers from one of the main recruitment zones. That case study compares a single group of

settlers who migrated from the same home village and were in the same project villages in 1979, with related households that did not migrate but remained in the settlers' home village. The baseline research for the case study, conducted in 1978-1979, compares its results with results obtained from the AVV farm monitoring survey (McMillan 1983). Brief restudies of the settlers were conducted during 1983 and 1986.

Many of the hypothesized relationships between length of settlement and settler patterns of socioeconomic development that we examined in the AVV planned settlements, as compared with other areas of assisted and unassisted settlement in Burkina, were formulated on the basis of observations made during restudies of the longitudinal case study.

Complementary Studies

Frederic Guira, Contrôleur, DEPC (Division of Studies and Planning), AVV, prepared a special report on the history of *groupement* activities in the AVV planned settlements at Linoghin, Mogtedo, and Mogtedo Bombore and a second special study on the Linoghin market. Sommaila Sawadogo, sociologist, AVV-UP1, prepared a study of settler turnover in the AVV planned settlements at Mogtedo and Mogtedo-Bombore. Moustapha Ouedraogo prepared two special studies on gold mining and the Gadeghin agropastoralist zone. The *Cellule Suivi-Evaluation*, CRPA du Mouhoun (Chef, Traore Adama) reacted to our initial discussions of results by implementing a separate study to examine the history, size, and goods included in markets in the subsector. Fatou Kabore, *Animatrice*, Bureau Ministère de l'Environnement et du Tourisme, Mogtedo, and Mogtedo CR (Comité Révolutionnaire) Délégué Chef, Joseph Guigma, worked with us to prepare a brief history of the town and market of Mogtedo, in addition to following market activity during several seasons. See McMillan, Nana and Savadogo (1990) for additional details on the methodology of the Burkina Country Case Study.

Ghana

The land settlement review in Ghana was carried out in three phases: the informal and familiarization phase, involving travel and observation studies by the country case-study director in various onchocerciasis control areas in

parts of the Northern and Upper East Regions during February and March 1989; the regional case study interviews phase, covering the period April to September 1989, which was conducted at four selected sites; and the phase covering documentation and formal discussions with country experts, undertaken at various times during the fieldwork, particularly toward the end of September 1989.

The bulk of the review is the regional case study conducted at four research sites: the Red Volta Valley; Fumbisi-"Overseas"; Damongo; and Tono Irrigation Scheme. We used Ghanaian enumerators, assistants, and interpreters, working in assigned groups and sites some of the time but for the most part, working together as a team under the country case-study director. Choice of the sites was purposive and was done to draw on areas that represented one or more of three major types of settlement: planned, assisted spontaneous, and unassisted spontaneous.

Onchocerciasis was endemic in the Red Volta and large parts of the Fumbisi-"Overseas" areas. At the peak of its work a large part of the activities of the OCP were concentrated in the Red Volta, Sisili, Kulpawn, and White Volta valleys, which traverse settlements in the Red Volta and the Fumbisi-"Overseas" sites. In contrast, the Damongo and Tono sites, though located within the oncho control zone, were never particularly problem areas. These two sites were studied for their lessons from past and current experiences in Ghana's attempts at resettlement agriculture: to obtain a better understanding of the problems and the successes, if any, that characterized these experiences, and to help in the formulation of effective and appropriate policy guidelines for the socioeconomic development of the oncho control areas of the country. The four sites were therefore chosen for their contrasting environments and for opportunities for reviewing the dynamics of population, migration, and settlement, and how these cumulatively impact on the varying states of agricultural development in northern Ghana.

On the basis of observations made during the familiarization tours, various sample settlements within the four study sites were selected for study. A sample frame of all compounds (or households) in these settlements was constructed and the migration history of the household heads was recorded, followed by a compilation of a list of those heads who had migrated before. For each study site a sample of 30 compound/household

heads was chosen from this list for the questionnaire interviews, making a total of 120 for Ghana.

The Red Volta study covered 30 returned-migrant farmers in two contrasting settlements: Senotl, inhabited by Namnam (the plural of Nabnam), a Frafra subcultural group, and Widnaba, a Kusasi settlement. The 30 farmers in Fumbisi-“Overseas” were also returned migrants with 10 of them selected from the Butsa settlement of Pentensa-Fumbisis, and 20 from the three Mamprusi settlements of Kubore, Kubugu, and Kibaayire located at “Overseas.” For Damongo, 30 in-migrant farmers were selected, divided evenly among the Konkomba, residing at Sorri village that was founded in 1962, the Frafra, residing at Settlements Number 2 and Number 6, many of them since the 1950s, and the multiethnic settlers, residing at the site of the former Gonja Development Corporation project, where they have been farming since the 1970s. The 30 Tono farmers were also divided evenly between 2 of the 8 project settlements: the Nankani village of Korania, where project farmers had been in place since 1982, and the Balsa village of Chuchuliga, where the farmers have been using irrigation since 1984. These compound/household heads were interviewed with two sets of questionnaires, designed for adaptation and use in all the country case studies. These deal with demographic and migration processes, and farm level and rural production processes.

At each study site, key informants, consisting of chiefs and their elders, influential elites, and knowledgeable individuals were also interviewed to obtain pertinent information about settlement and regional development issues such as land tenure, markets, infrastructure, natural resources, and perceptions about problems and potentialities. See Akwabi-Ameyaw (1990) for additional details on the methodology of the Ghana Country Case Study.

Mali

The Mali case studies were done by a team of researchers from the Institut des Sciences Humaines, Bamako, in conjunction with the Mali country case-study director. The studies were planned by the team during March 1989, and implementation was begun in June. Researchers were in the field in June and July, and provisional data entry, analysis, and write-up of site reports was done in Mali in July of 1989. A draft country

study was produced by the country case-study director, based on the site reports, in November 1989.

The Mali LSR study included field work at 5 sites. At 4 of these sites (Yanfolila, Selingue, Dioila, and Finkolo), 30 households (10 in each of 3 villages) were chosen for intensive study. At the fifth site (Tienfala), 9 households (3 in each of 3 villages) were studied. The country case-study report also drew on data from the Manantali Resettlement Project, on which the country case-study director has served as consultant since 1985. In addition, a team of social scientists from the Institut des Sciences Humaines has done a series of studies on domestic production in Manantali, and their data were also used for the Manantali information.

In the LSR study sites, there were two sets of interviews at the village level, one with village elders and another with women. These village-level interviews concerned patterns of settlement; land, pasture, and tree tenure; patterns of authority and conflict; and natural resources management. These interviews were complemented by information gathered at the household level that concentrated on household productivity and migration histories. See Koenig (1990a) for additional details on the methodology of the Mali Country Case Study.

Togo

The Togo country case-study research program comprised three phases. During the first phase, field studies were conducted at two sites in OCP areas: the FED-Agbassa Project (Kara Region) and the Mo Plain (Central Region), beginning on 13 April and continuing through late May 1989. Teams of researchers, under the direction of the country case-study director, worked at each site. Each team was headed by a Togolese consultant (a rural sociologist at FED-Agbassa; an Agronomic Engineer-Planner in the Mo Plain), and included several enumerators, translators, and in the case of the Mo Plain team, a geographer. The second phase of the program consisted of follow-up work by the country case-study director in the Kara Region and Lomé from 12 June to 15 July. The program's third phase occurred during the first half of August, when one of the Togolese consultants conducted surveys of markets at Broukou (FED-Agbassa) and Tindjasse (Mo Plain). Initial drafts of the country case study

report were prepared in August and October on the basis of (a) the consultants' site reports, (b) preliminary tabulations of results from the household and village surveys, and (c) data collected by the country case study director.

The Togo study gathered data from a sample of 60 households. Ten household heads and their wives (or the senior wife in the case of polygynous households) were interviewed in each of six villages selected for the IDA study. Household members were interviewed in the villages (settlement sectors) of Agbassa, Broukou, and Agunde at the FED-Agbassa project. In addition, village chiefs and leaders of the sectors' settlement blocks were interviewed. In the Mo Plain, household members were interviewed in the villages of Okou, Kpangam, and Folo. Village chiefs and other notables were also interviewed in these villages, and in three additional villages: Lawo, Djarkpanga, and Boulohou. All household and village-level interviews were conducted on the

basis of questions designed for use in all four country case studies of the Land Settlement Review, and were adapted as needed for specific conditions in Togo.

Household respondents were asked questions about their family size; migration histories; production, including land use, estimated production in 1988, use of inputs and improved technology, and use of household and external labor; purchases and expenditures; and sources of off-farm income. Village leaders were asked questions concerning the history, patterns, and pace of settlement in the area; land use patterns; natural resource management; and availability and condition of infrastructure, markets, and services. The consultants also conducted documentary research and interviewed representatives of government agencies, projects, and nongovernment organizations. See Painter (1990) for additional details on the methodology of the Togo Country Case Study.

Annex 3. Linking New Lands Settlement with Development of Sending Areas

Introduction

Drawing on experiences from Africa, Asia, and especially Latin America, Annex 3 is intended to be a general justification for linking the development of sending and receiving areas. Sending areas that are the source of migration for new lands settlement rarely receive the attention they deserve from national governments and international donors. Social, economic, and environmental processes in migrants' areas of origin exert a profound influence on which portions of a population move to a settlement area, their reasons for moving there, and the resources and skills they take with them. These processes are related to a number of factors. Some, such as social class, language, and ethnicity, operate among the rural people themselves, shaping their relationships with one another and with development officials. Others have more to do with the ways in which regions fit into the national and international economy and society.

Both sets of issues—the social and cultural characteristics of the population, and the links between local production and broader national and international processes—interact to form a complex web of relations between areas sending people and those receiving people. As a result, conditions in sending areas strongly affect the opportunities and limitations for successful development in a settlement area. At the same time, the course of development in the settlement area frequently defines opportunities and limitations in migrants' areas of origin.

For development agencies, the implication of this is that the planning and implementation of successful settlement projects should take place at a regional level or higher level, and cannot be limited to the settlement area itself. The definition of the region should be based on an understanding of the kinds of ties that bind settlement areas and sending areas in the particular case. Planning needs to reflect an understanding of the implications that these relationships have for the success or failure of development efforts.

Social Processes within the Rural Population

An important factor shaping migration to a new lands settlement area is social class formation in migrants' areas of origin. Although rural populations often appear at first glance to be uniformly poor, they are generally characterized by inequality in wealth, and by diversity in how families actually earn a living. The amount of wealth that families control and the source of that wealth shape the conditions under which they are likely to migrate, the resources and skills they will carry with them, and what they wish to accomplish through their migration.

For example, spontaneous settlers tend to be the wealthier members of the communities from which they come, and their motivation to migrate to a new area may have less to do with the need to earn additional income in order to survive than with limited opportunities to exercise entrepreneurial initiative and improve their situations. Some may have enough resources of their own to

hire labor, purchase farm inputs, or invest in agroprocessing facilities (e.g., a corn mill, or a silo permitting them to bulk and resell grain). When these individuals hire labor in a new settlement area, they often turn to the people they hired in their home communities. In such cases, many features that combine patron/client ties, wage relations, and other bonds of reciprocity and obligation characteristic of sending areas are reproduced in the newly settled area.

Local Production in Regional and National Context

Migration is a response to perceived differential opportunities between the sending areas and the settlement areas. A relatively wealthy member of a population may perceive greater opportunities in the settlement area than at home, while a poor person may see the new area as an alternative to the impossibility of continuing to subsist in the home area.

Beyond knowing how the differential opportunities are perceived by different portions of the local population, development planners must understand the relationship of the sending area to regional and national economic processes. For example, opportunities might be limited by national agricultural policies that are intended to promote cheap urban food supplies and the production of industrial export crops, but that lead to disadvantageous terms of trade for the rural population as well as difficulties in receiving technical assistance, credit, or even access to agricultural inputs. Such a problem may be particularly acute for some portions of the population because they face other constraints, including, at times, inequitable land distribution and insecure tenure.

Such circumstances frequently result in the establishment of mutually reinforcing cycles of impoverishment and environmental destruction. As poor rural families become poorer they tend to become increasingly dependent on off-farm employment. At the same time, because of the usually low-paying, seasonal, or unstable nature of the employment opportunities available to them, most must also continue to rely on agricultural production on their farms. Balancing off-farm employment with the demands of agriculture taxes family labor resources, however, so that medium-to-long-term natural-resource management is sacrificed to short-term survival needs. Over time, the physical deterioration of the farm

increases the pressure to rely more heavily on off-farm income, which further restricts the ability of families to manage their farms properly.

This dynamic in various contexts can affect the success of settlement as a development strategy. First, if national policies limit possibilities for earning a living through agriculture in migrants' home areas, they may well do the same in the settlement areas. In the context of reproducing social class relations, this may also lead to reproducing impoverishment and environmental destruction. Thus, unless preventive measures are taken, the problems of the sending areas are transferred to the settlement area.

Second, to the extent that investment to promote development in the settlement area precludes promoting development in the sending area, settlement becomes one more source of regional inequality. It compounds the pressure for families that remain in the sending areas to seek off-farm employment. In this respect, the promotion of new lands settlement as a development strategy may actually make conditions in the sending areas worse.

Interaction of Internal and External Factors in Shaping Settlement Success

Processes such as social class formation occur within a population, while those related to how a region fits into the larger social and economic context are issues external to what occurs at the level of local populations. These internal and external processes affect one another, and their interaction can define the direction of settlement-based development.

One area in which this is apparent is how the revenues from being a settler or a wage laborer are invested. In some contexts they may be reinvested in the settlement area: a farmer may use profits to purchase more inputs and intensify production or to invest in agroprocessing. It is as likely, however, that revenues derived from settlement will be invested in sending areas. Among poor families whose members are involved in settlement as wage laborers, this probably means little more than using their earnings to buy food and other necessities for survival. Among wealthier families, it often involves the purchase of vehicles, the establishment of businesses, or the acquisition of more and better land.

Planners of settlement-based development cannot provide appropriate incentives to promote de-

velopment without taking into account the sending areas of migrants as well as the areas being settled. In recognizing this they improve the chances that settlement areas will be successful in their own right, and that settlement-based development will provide benefits that support broader regional and national development interests.

Conclusion

Paying attention to migrants' sending areas makes clear three important points in settlement-based development. First, while settlement may open new opportunities for economic growth and development, it does not offer a blank slate on which to work. The same processes that cause some to become wealthy and others to become poor affect settlement areas as they affect the rest of the country. Second, settlement cannot be used

to solve social and economic problems elsewhere. The solutions to problems of resource distribution, poverty, and environmental destruction must be addressed in the areas in which they occur, and in terms of the relationship between those areas and larger regional, national, and international social, economic and political units. When settlement is used as a substitute for appropriate development efforts in the sending areas, problems in those areas can thwart the success of settlement efforts, while settlement may actually worsen conditions in sending areas. The opportunities and limitations that characterize settlement-based development efforts are to be found within the settlement area as well as in migrants' home areas. In order to take advantage of the opportunities and minimize the problems imposed by the limitations, planning and implementation must take place within a regional context that includes both.

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