



**Rural
Finance
for Food
Security
for the Poor**

**IMPLICATIONS FOR
RESEARCH AND POLICY**

**MANFRED ZELLER
GERTRUD SCHRIEDER
JOACHIM VON BRAUN
FRANZ HEIDHUES**

IFPRI Food Policy Reviews

The Food Policy Review series provides a forum for scholarly reviews of the literature on key topics relevant to food and agricultural policy. These works are substantive syntheses of research on major food policy issues and may include original research to supplement the discussion. They provide considered judgments on policy options in light of current knowledge of the processes underlying the reduction of poverty, hunger, and malnutrition in the world.

All manuscripts submitted for publication in the Food Policy Review Series undergo extensive review under the auspices of IFPRI's Publications Review Committee. The review process includes presentation of the manuscript in a formal seminar and selection by the Review Committee of external and internal reviewers chosen for their expertise in the manuscript's subject matter and methodology. The author responds to the reviewers' comments, and, if approved by the Review Committee and IFPRI's director general, the revised manuscript becomes part of the IFPRI Food Policy Review series. Members of the Publications Review Committee are Lawrence Haddad (chair), Suresh Babu, Christopher Delgado, Hans Löfgren, Ruth Meinzen-Dick, Philip Pardey, Agnes Quisumbing, and Barbara Rose (ex officio).

FOOD POLICY REVIEW 4

**Rural Finance for Food Security
for the Poor**

Implications for Research and Policy

**Manfred Zeller
Gertrud Schrieder
Joachim von Braun
Franz Heidhues**

**INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
WASHINGTON, D.C.**

Copyright 1997 International Food Policy
Research Institute.

All rights reserved. Sections of this report may
be reproduced without the express permission of
but with acknowledgment to the International
Food Policy Research Institute.

Library of Congress Cataloging-
in-Publication Data

Rural finance for food security for the poor
: implications for research and policy / Man-
fred Zeller . . . [et al.].

p. cm. — (Food policy review ; 4)

Includes bibliographical references (p. 118).

ISBN 0-89629-503-6

1. Agricultural credit—Developing countries.
2. Food supply—Developing countries. I. Zeller,
Manfred. II. International Food Policy Research
Institute. III. Series.

HD1440.D44R87 1997

97-7361

332.7'1'091724—dc21

CIP

Contents

Foreword		vii
Summary		1
Chapter One	Introduction	6
Chapter Two	A Broader Role for Rural Finance for Food Security	12
Chapter Three	The Saving and Borrowing Behavior of the Food-Insecure Poor	51
Chapter Four	Innovative Rural Finance for the Poor: A Food Security Perspective	83
Chapter Five	Conclusions for Research and Policy	111
References		118

Tables

1. Informal savings and credit arrangements in developing countries	34
2. Savings motives, Cameroon	58
3. Asset portfolio and liabilities of rural households, differentiated by wealth, Madagascar, 1992	58
4. Household total savings, differentiated by wealth, Madagascar, 1992	59
5. Purposes for which a loan was sought, western Nigeria, 1983	62
6. Access to and use of credit, differentiated by income group, The Gambia, 1987	63
7. Proportion of expenditures met through credit, by asset quintiles and use of credit, Pakistan, 1990	65
8. Proportion of expenditures met through credit, by asset quintiles and use of credit, Madagascar, 1992	65
9. Percentage distribution of amount and number of loans from formal and informal sources of credit by asset quintiles and major sources of credit, Pakistan, 1990, and Madagascar, 1992	67
10. Uses of loans from self-help groups, Cameroon, various years	69
11. Credit limits per capita, by survey round and NGO credit program participation, Bangladesh, 1994	72
12. Credit limits per capita, by tercile of years of credit program membership, Bangladesh, 1994	73
13. Demand orientation of innovative rural finance schemes for the poor	96
14. Accessibility of innovative rural finance schemes for the poor	102
15. Financial viability and sustainability of innovative rural finance schemes for the poor	106

Illustrations

1. Levels of analysis	13
2. Access to financial services and its effects on household food security	26

Acknowledgments

We gratefully acknowledge comments on earlier drafts from Douglas Graham, Erhard Kropp, David Nygaard, Keijiro Otsuka, John von Pischke, Jean-Philippe Platteau, Sara Scherr, and Hans-Dieter Seibel. We are also grateful for financial support from the Ministry of Economic Cooperation and Development, Federal Republic of Germany. The content of this review does not necessarily reflect the views of the commentators or institutions, including the International Food Policy Research Institute. Factual and other errors are entirely ours.

Manfred Zeller
Gertrud Schrieder
Joachim von Braun
Franz Heidhues

Foreword

Since the incomes of most rural households in developing countries depend directly or indirectly on agriculture, they vary from year to year, and within years, from season to season. Such fluctuations in income translate into fluctuations in consumption if households cannot fall back on savings or access to credit. These fluctuations can be especially serious where food and other basic necessities are already in short supply. For these households, even a relatively small temporary reduction of income means consuming less food than is required to maintain an active and healthy life. These periods of transitory food insecurity are experienced by many rural households in developing countries and can lead to chronic food insecurity and deprivation, forcing households to sell off whatever productive assets they possess.

How poor rural households manage crises, especially food shortages, has been a research topic at IFPRI almost from its inception. Because financial services are so closely related to food security and the well-being of rural households, IFPRI has paid close attention to innovative developments in the rural financial sector that enable the poor to initiate strategies for long-term risk management before crises develop. Past IFPRI research on credit for alleviation of poverty has looked at the Grameen Bank in Bangladesh and at the effects of rural financial institutions on agricultural development. Since 1993, IFPRI has conducted a multicountry research program on rural financial policies and has undertaken extensive household-level studies in nine developing countries. Some of the results from this ongoing research program are discussed in this food policy review.

Here the authors examine the potential for improving household food security by providing access to financial services. The study is based on a review of theory at household and institutional levels, empirical evidence on the borrowing and saving behavior of the rural poor, and on the experiences of selected innovative financial institutions in developing countries. According to its conceptual framework, financial services could help prevent both transitory and chronic food insecurity. First, by providing access to credit, savings, and insurance services, households could acquire inputs, labor, and equipment to generate additional income. Second, access to financial services could increase their capacity to bear risk, enabling them to invest in new

agricultural technology and off-farm enterprises. Third, improved access to financial services could help stabilize consumption.

The review brings together different strands of the food security and finance literature by focusing on the role of financial services for improving household food security. It draws conclusions for policy and institutional design as well as for research that should be valuable to anyone involved in designing or evaluating policy and programs for rural financial institutions today.

Per Pinstруп-Andersen
Director General

Summary

Because rural incomes fluctuate from season to season and a multitude of risks affect income levels and consumption, poor rural households in developing countries demand access to financial services to help stabilize income and consumption and alleviate chronic and transitory food insecurity. The objectives of this review are to examine the potential for improving food security by providing access to financial services and to discuss these findings for policy and institutional design. The study is based on a review of theory at household and institutional levels, empirical evidence on the borrowing and saving behavior of the rural poor in developing countries, and on the experiences of selected innovative institutions providing financial services to the poor.

For decades, the task of rural finance was primarily seen to be promoting agricultural production by providing credit to farmers. When problems began to accumulate in the 1970s and 1980s, leading to outright failures of some state- or donor-sponsored banks and credit programs, agricultural credit was frequently abandoned, and structural adjustment and financial sector reform moved to the center of attention. By the late 1980s, it became clear that the poor's access to institutions, markets, and infrastructure set narrow limits within which equitable economic and social development could proceed. In the process of poverty alleviation, the roles of technological innovations in agriculture, rural infrastructure, and price policy have become better understood, and clearer policy guidelines are emerging. This is not yet true of the role of rural financial institutions. In the standard approach to rural finance, the production side of rural farm households is seen as providing the main rationale for credit. The demand of poor households for financial services related to consumption smoothing, education and training, off-farm income-generating activities, and insurance are often overlooked. Traditionally, these services have been provided almost exclusively by the informal financial sector. Many lessons have been learned from the failure of supervised parastatal credit programs, the subsequent widespread withdrawal of subsidies leading to the collapse of smallholder agricultural credit systems in many developing countries, the thriving existence of informal financial institutions, and

the recent institutional innovations in participatory banking services for the poor. They encourage a fresh look at the role of rural financial policy for improving household food security and alleviating poverty.

Based on a review of the theory of intertemporal behavior (current and future behavior) of households, a conceptual framework is developed in this review that links access to financial services with household food security. The framework distinguishes three pathways by which access to credit, savings, and insurance services can improve transitory and chronic food security. First, credit or savings can provide capital for financing inputs, labor, and equipment for income generation. This is the traditional argument for rural financial policy. Second, access to credit, liquid savings (that can be readily converted to cash), and insurance services can help households increase their capacity to bear risks or to reduce the cost of insurance. This may then enable households to invest in new, more risky, but also more profitable enterprises and asset portfolios, including build-up of human capital through education, for example. Third, improved financial services can potentially stabilize consumption of food and other essential goods more efficiently than existing informal services do. While the first pathway primarily addresses the problem of chronic food insecurity, the third helps prevent transitory food insecurity. The second pathway reduces chronic food insecurity, through more efficient and profitable asset portfolios, and reduces transitory food insecurity by reducing the costs of stabilizing a household's consumption by saving and insuring for hard times in advance. Which pathway is most important and which type of financial service is most demanded depends on the characteristics of the household and its socioeconomic and agroecological environment.

Based on this framework, a broader role for rural financial policy is postulated here. Rural finance for enhancing household food security not only implies credit for agricultural production or off-farm micro-enterprises, but also credit and savings services that respond to the demand for precautionary savings and consumption smoothing, as well as the provision of savings options with different maturity dates, risks, and interest rates for more efficient asset portfolios and capital accumulation. This broader role for rural financial policy also emphasizes the potential of insurance services that can be provided by member-owned and member-controlled institutions, at least for covering idiosyncratic risks (those risks that affect an individual, such as illness, but not an entire community).

Furthermore, from the viewpoint of the perceived linkages between rural finance and food security, the traditional definition of household savings is too narrow. In many rural developing economies, family labor is the most important factor for increasing production. This study finds that the definition of household savings should be expanded to include investments in human capital, such as improving the education and nutritional status of family members. This expansion of

the concept of savings may also contribute to an acceptance of the use of credit to obtain food and other basic goods, which is still a controversial issue among bankers and economists.

This broader concept of rural finance and household food security provides a rationale for policies that aim at sustainably expanding credit, savings, and insurance services for the rural poor. Policy instruments that directly aim to diversify and increase incomes are necessary but not sufficient for ensuring household food security. For example, direct income transfers or stabilization of food prices through open-market transactions by the government often require considerable response times, incur administrative costs, and induce leakage of income intended for certain groups to others; therefore, they may not be cost-effective in targeting specific groups among the poor. In comparison, savings, credit, and insurance markets could potentially offer households a quicker and more effective means of smoothing their disposable income and thus consumption. Under many circumstances, the household's access to financial services may enable a faster, more cost-effective, and more adapted response to the household's demand for consumption smoothing than income stabilization programs of governments, which are usually implemented when the shock has already occurred.

However, significant impediments to this broader role for rural finance for the poor exist. These include differences in information between market partners, so that either the lender or insurer or the borrower or insuree loses; risks to the individual (illness or injury) or to the community as a whole (such as drought or flood) that jeopardize the fulfillment of the financial contract; and lack of collateral. All of these constraints result in high unit transaction costs for financial contracts, particularly for the poor who are only able to save or borrow a little at a time. Informal institutional arrangements circumvent some but not all of these constraints. Much remains to be learned from these systems through future field research. Major weaknesses of the informal market are the lack of medium- and long-term loans, the lack of monetary savings options with real returns, and the fragmentation and geographical isolation that lead to inability of the informal market to deal effectively with widespread risks and to mobilize capital from and allocate capital to different regions and economic sectors. Nevertheless, informal institutions—because they are built on knowledge of the people in the community—are better able to obtain sensitive information about the reputation, wealth, and indebtedness of potential clients than socially and physically distant bank agents.

Member-based institutions at the community level, such as credit groups, cooperative societies, and village banks, can exploit this cost advantage through appropriate institutional arrangements. Innovative financial institutions for the poor—some of them reviewed in this study—build on and make use of the principles of informal finance by using locally available information and social contacts in designing and

enforcing contracts. Therefore, the most promising of recent strategies for financial market development is the linkage of member-controlled financial institutions with a liberalized banking and cooperative sector. Based on a review of selected, rural financial institutions in developing countries, this review discusses various alternatives to the top-down approach of traditional rural credit programs. These include member-controlled savings and credit cooperatives, informal savings and credit clubs and village banks linked with the banking sector, and group-based rural banking institutions. Liberalized macroeconomic and financial sectors are crucial for enabling member-based financial institutions and second-tier banking institutions to enter into and sustain viable linkages with the formal sector. Furthermore, policy for the financial sector must provide a regulatory framework that enables member-based institutions to transact with the banking sector and to adapt their retail financial services and contractual terms to the local supply and demand patterns at the community and household levels.

Some key factors in the success of these member-based institutions are (1) the provision of financial products that effectively respond to the demand for diverse savings and credit options, stressing the demand of the poor for precautionary savings and insurance services; (2) use of locally adapted collateral substitutes such as peer pressure, obligatory savings, or character references that reduce transaction costs for screening, loan disbursement, and repayment, including the risk of loan default; (3) savings and credit interest rates that are market-based in order to attract savings deposits, to cover administrative and capital costs, and to avoid better-off groups trying to take advantage of artificially low rates; and (4) flexibility in making decisions and creating incentives for program compliance at the grassroots level.

These common attributes do not imply that their application in different socioeconomic and agroecological environments will be successful. In identifying suitable institutional arrangements among the financial intermediary, borrower, and saver, considerations should include the functioning of indigenous financial market arrangements as well as the existing physical infrastructure, human capital, and socioeconomic conditions faced by the potential clients.

Few rural financial institutions for the poor, including some presented in this review, have attained significant levels of outreach. Most of them depend on public subsidies, to some extent. Recent research analyzing the effectiveness of these institutions indicates gains in income, but also gains in food security and educational and nutritional status. If rural financial institutions contribute to the efficiency and equity objectives of policy, they assume a task of the public sector. Therefore, contemporary publications on this subject argue that public support for building financial institutions for the poor is justified, provided subsidies can be phased out after the initial years of institution building and provided the institution is financially sustainable in the long run.

However, from a policy perspective, public support for building rural financial institutions ought not—in principle—to be judged on the prospect of achieving the financial sustainability of the financial institution itself, but on the economic sustainability and the social returns from public investment in rural financial institutions, compared with the social costs arising from the investment, including opportunity costs of alternative use of public resources. For example, in most developing countries, support for building and maintaining a primary education system for poor children is only financially sustainable through direct subsidies by the public sector. Yet this policy is, in many cases, economically viable and sustainable, since long-term social returns to education are high. In many rural settings of developing countries, long-term support for building and maintenance of rural financial institutions that serve the poor may have higher benefit-cost ratios both now and in the future than some competing policy instruments.

A cost-benefit evaluation of public investments in rural financial institutions, however, has so far not been undertaken because rigorous quantitative assessments of the welfare benefits of access to financial services are lacking. Because of this information gap, it seems appropriate and pragmatic to limit public support to the initial phase of institutional formation. However, one has to realize that this rule of thumb may well lead to under- or overinvestment of public resources in the innovation, formation, and maintenance of rural financial institutions.

While the role of the public sector in research and transfer of agricultural technology is indisputable, its role in promoting the generation and dissemination of improved institutional arrangements continues to be questioned, whether it is the intrinsic problems of intertemporal markets such as credit and insurance or those of common resource management that are being addressed. This review concludes that the public sector can play a useful role in institutional innovation and formation for the benefit of the poor and for society at large. There appears to be no justification for public policy to confine itself to creating an enabling regulatory environment for a market economy in which institutions by and for the poor are expected to eventually form and prosper on their own. Neither should policy rely on market forces to generate much-needed institutional innovation—triggered by relative factor prices that may not necessarily reflect the true social costs—nor should policy have to wait for altruistic leaders to respond in times of poverty and hunger by experimenting and eventually generating new institutions that can provide the poor with better access to financial services. The public sector, through support of policy research and related participatory long-term pilot and capacity-strengthening programs, can itself make a difference in institutional innovation.

1

Introduction

Financial services for the poor pose some specific policy and program design problems. The poor have little or no collateral to offer. Savings and credit amounts and installments are small, raising per unit transaction costs. Credit needs for production and consumption cannot be clearly distinguished in poor households where spheres of production and consumption are intertwined and often inseparable. Given the vulnerability of the poor, risk aversion and related insurance behavior play important roles. Covariate risk, such as drought or flood, and seasonal as well as individual household crises are central problems of the poor. They often can only respond with costly and imperfect coping mechanisms in the absence of accessible financial services.

Unsatisfactory experiences with supervised credit projects in the 1970s and 1980s suggest that more information is needed about how to design credit and savings services for the poor. The poor have traditionally obtained such services almost exclusively from informal networks. A better understanding of existing informal institutions at the household and community levels could provide the key to designing sustainable rural financial systems that serve the poor. Innovative approaches are needed for linking—and, thereby, expanding—informal systems, built from the bottom up, with the formal credit and savings systems of rural banking institutions and cooperatives. However, to be sustainable, financial services for the poor must be financially viable for both the client and the financial institution and economically viable from the perspective of public policy. Financial and economic sustainability in many settings could potentially be achieved through institutional innovations with participation by the poor.

Providing financial services to the poor could efficiently and effectively contribute to income generation and consumption stabilization, thereby addressing the long- and short-term food-security problems of the poor. The purpose of this review is to explore these potentials and identify research and policy implications. A conceptual framework is developed that relates access to financial services to household food security and derives implications for the pattern of household demand

for financial services. This is followed by a review of the constraints to development of rural financial markets and of the potential for informal and formal institutional arrangements to circumvent these constraints and respond to the demands of the poor. The conceptual framework guides the review of empirical evidence on borrowing and savings behavior of poor households and of selected innovative rural financial institutions.

Linking Food Security to Financial Markets

Food security, at the household level, is defined in its most basic form as access by all people at all times to the food needed for a healthy life. Access to adequate food is a necessary but not a sufficient condition for a healthy life; a number of other factors, such as the health and sanitation environment and household or public capacity to care for vulnerable members of the society, also come into play (von Braun et al. 1992).

The risk of not having access to needed food can be related to low income and food production, for instance. Typically, this risk is higher the closer a household is to inadequate dietary intake even in a normal situation. An effective food-security policy aims to ensure that all household members have adequate dietary intake without taking excessive risks to attain it.

Food insecurity includes a temporary shortfall of adequate food for a proper diet, called "transitory food insecurity," as well as a long-term food shortage called "chronic food insecurity." Rural households cope with transitory food insecurity by diversifying their income sources, by selling assets, or by resorting to informal or formal credit, savings, and insurance markets (Teklu, von Braun, and Zaki 1991). If the rural poor have to cope repeatedly with transitory food insecurity, the income and productive base tends to become depleted. This, then, may eventually result in chronic food insecurity.

Policy instruments for improving household food security are manifold. Given the determinants of household food security, these can be systematized into policies that aim to (1) increase the household's income, (2) stabilize or lower food prices, or (3) improve the household's access to intertemporal markets (credit, savings, or insurance products that require a transfer of resources over time).

The first two policy sets are geared toward increasing a household's income and purchasing power—either in particular seasons or years or as part of long-term strategies. Key policy instruments for achieving long-term food security are the transfer of technology to farmers and investment in rural production and infrastructure, combined with extension and credit programs. These measures must be part of any develop-

ment strategy. Policies to address directly problems of income and purchasing power during specific periods are the stabilization of key commodity prices and targeted interventions, such as income transfers, food subsidies, or public works projects for the food insecure.

The third policy set aims to improve the household's ability to adjust its consumption and investment between periods via access to savings, credit, and insurance markets. In contrast to the first two policy sets, the immediate goal is not to influence income directly in a particular period, but to enable households to make adjustments of disposable income intertemporally, that is, from one period to another. Savings reduce disposable income and consumption in the current period but increase it for future periods. For food-insecure households, savings in the form of cash, food, and other assets are an important means of self-insurance against anticipated or unexpected times of food insecurity. Borrowing, on the other hand, increases current disposable income at the expense of available income in future periods. It enables investment in human and physical capital that may improve future income and consumption or avoid shortfalls in current consumption. Access to credit, not actual borrowing, can serve as an insurance substitute. Acquiring insurance enables the household to transfer part of its risk to an insuring institution. The household pays an insurance premium that lowers disposable current income, but also reduces the variance of consumption in future periods.

Policy instruments that directly aim to diversify and increase incomes are needed, but such instruments alone will not ensure household food security. Many poor households face the risk of transitory food insecurity, even if their incomes, on average, provide a sustainable, adequate standard of living. Thus, there is a potential demand for savings, credit, and insurance services that more efficiently contribute to consumption smoothing. There are many sources of risk in rural households, and the time pattern, intensity, and effects on food security of income fluctuations are difficult to anticipate for household members and policymakers alike. Government policies to influence and stabilize household incomes via direct income transfers and price stabilization often take a long time to respond and may not be cost-effective in targeting specific groups among the food-insecure rural poor.

In contrast, intertemporal markets for savings, credit, and insurance could potentially offer households a quick and effective means of smoothing their disposable income and therefore consumption. When institutional arrangements function well, the household's ability to alter disposable income via savings and disinvestment, credit, and insurance contracts is likely to be faster, more cost-effective, and more specifically adapted to the household's needs than after-the-fact income stabilization programs of governments, such as emergency food aid, public works programs, or food subsidies.

Policy Research Issues

While the roles of new technology in agriculture, rural infrastructure, and prices in enhancing the process of poverty alleviation are increasingly well understood to the extent that clearer policy guidelines are emanating from research, this cannot be claimed with regard to the role of rural financial markets in alleviating poverty. In the conventional approach to rural finance, the production side of rural farm households generally provides the rationale for rural credit. Often overlooked is the poor household's demand for financial services related to food consumption, health needs, social purposes, and insurance. In addition, too little is known about the demand for credit and savings options to facilitate long-term investment in items such as land purchase, soil conservation, tree planting, and irrigation.

The integration of women into typical agricultural credit schemes is especially lacking. In view of the essential role that women play in expanding food output and processing, their exclusion poses both an equity and an efficiency problem. Moreover, rural financial institutions can, in principle, provide channels for the delivery of other services, such as nutrition education or public health services, where alternative institutional channels are weak.

An important element in this research is the need to build innovative rural finance systems from the bottom up. Learning from and building on existing informal systems currently being used by the poor are essential to achieve viable innovative credit programs targeted to the poor. Since many credit and insurance schemes that have been tried have failed, considerable effort has been made to examine the indigenous informal institutions that provide financial services. Such informal arrangements provide savings options and credit sources, but also insurance and risk-pooling services. High transaction costs due to information asymmetry and poor infrastructure are major constraints in the development of formal institutional arrangements, but these appear to be less of a hindrance in networks of close social interaction (Platteau 1992a). Furthermore, recent research suggests that small voluntary groups at the village level, for instance, often organized as savings clubs, can serve as a point of entry to more formal institutions (such as credit unions) that serve as savings facilities and extend production and consumption credit to the rural poor (Seibel 1985).

Frequently, transaction costs for rural lending are a critical issue, especially where rural institutions and infrastructure are weak. Broad coverage of rural areas, reaching a high proportion of clients in those areas, can increase the scale of operation and lower transaction costs. However, it is important to note that there are trade-offs between exploiting scale economies by expanding the volume of particular savings or loan products and diversifying the portfolio of liabilities and assets of rural financial institutions. The need to diversify is especially

strong when financial institutions operate in rural areas with significant covariate risks such as drought or flood that affect most of the people in a region. Whereas economies of scale favor specialization in particular financial products, risk considerations call for diversification, thus reducing the potential for exploiting economies of scale. Moreover, economies of scale will be smaller in areas with poor communication and transport infrastructure, low levels of economic development, and low population density. These poorly developed areas are often associated with high levels of covariate risk. For example, the potential for exploiting economies of scale in rural financial markets is low in semi-arid, sparsely populated areas, compared with densely populated areas with well-developed infrastructure, including irrigation, and a more diversified rural economy.

The managerial capacity of a financial institution is a critical variable in determining its viability, its capacity to absorb losses, and size of program. Credit is a crosscutting issue, not a narrow sectoral problem or an input like fertilizer or irrigation. It requires looking at the role poor people play in the whole institutional framework. The collateral usually required by a bank discriminates against the poor, particularly against women who own little land. The reimbursement of loans for income-generating activities raises the question of the control that particular household members have over monetary income and, more generally, of women's or men's autonomy in financial and economic activities. These aspects, including the ability of the poor as borrowers to manage their finances, need to be taken into account.

The role that savings mobilization can play in consumption stabilization and long-term investment in human and physical capital at the household level needs to be explored further. Adams, Graham, and von Pischke (1984) conclude that more emphasis should be placed on savings mobilization, on providing more access to formal loans to nonfarm rural firms, on charging more realistic interest rates, and on doing less loan targeting. Given the diversity of income sources of the poor and their need for both production and consumption credit, as well as savings outlets, the need for multipurpose financial institutions, rather than the specialized savings or lending institutions currently existing in many countries, becomes apparent. Financial institutions that will respond quickly and efficiently to the economic demand for credit, realistically taking into consideration the ability of rural households to repay, are necessary in a diversifying rural economy. Institutions that dispense highly restrictive lines of credit and do not extend consumption loans are not likely to be perceived as helpful: households are not likely to choose to deposit savings with them in anticipation of future loans (Meyer and Gonzalez-Vega 1986).

On the basis of their extensive review of the performance of rural credit markets, Braverman and Guasch (1986) contend that a more systematic and rigorous analysis of institutions and institutional environ-

ments is essential to lay the groundwork for effective policy reform in rural credit markets. A review of U.S. Agency for International Development (USAID) credit programs concludes that most programs had serious implementation problems and failed to meet their objectives (Chew 1987). In view of these implementation problems for small-holder credit programs, development assistance for agricultural credit has been substantially cut back during the last decade (World Bank 1994). Because the importance of institution building in financial sector development is widely recognized, rural finance projects have increasingly sought in the past decade to improve the financial sustainability of institutions, thus placing more emphasis on savings mobilization and diversification of loan portfolios. This suggests a new emphasis on research on self-sustaining rural financial institutions and on investigating the role that policy can play in facilitating the innovation, formation, and sustainability of institutions that supply financial services to the poor.

Overview

In Chapter 2, the conceptual framework at the household and institutional level is developed, based on an extensive review of the literature. The conceptual framework at the household level distinguishes three potential pathways by which improved access to financial markets can have positive effects on household food security. Based on the three pathways, a broader role for rural finance to improve food security is called for—a role that encompasses traditional agricultural credit and credit for small, off-farm businesses (here called microenterprises) but also includes savings and the establishment of credit and insurance services for consumption smoothing. Furthermore, the constraints to increased access to the financial market are systematized. This is done both at the level of institutions and at the macro level. Improving institutional arrangements calls for a better understanding of the conditions and driving forces for institutional formation and the necessary macroeconomic and sectoral policies to enable and accelerate such a process. Chapter 3 reviews the empirical evidence on saving and credit behavior of the poor, as it relates to the conceptualized linkages between access to financial services and household food security. Whereas the discussion in Chapter 3 is devoted to the household level, important traits of successful policy and program design for the development of rural financial institutions are identified in Chapter 4. The conduct of selected innovative institutions is reviewed, as is their performance in responding to the diverse demands for financial services by the poor from a food security perspective. The examples of institutional innovation are mainly from Asian and African countries, and the examples are clearly not exhaustive. Chapter 5, the concluding chapter, discusses policies that can facilitate the formation of sustainable financial institutions for the poor and suggests future research questions.

2

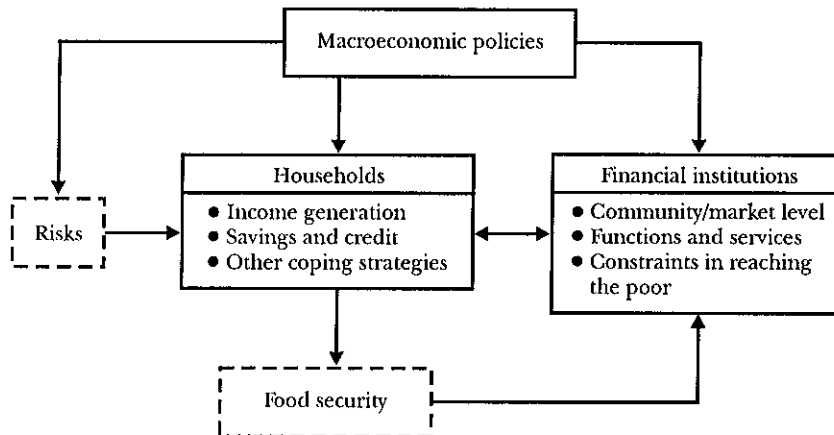
A Broader Role for Rural Finance for Food Security

The effects of policies that contribute to poverty alleviation through rural finance projects must be taken into account at three levels—micro, sectoral, and macro. At the micro level, in order to assess the potential role savings and credit institutions can play, it is important to understand the strategies rural households follow in coping with food stress. At the level of the financial sector, the institutional arrangements, their functions, and the constraints these institutions face in providing financial services to the poor need to be understood. Macroeconomic and sectoral policies that affect costs and returns of capital are, of course, relevant.

This chapter discusses conceptual issues at these three levels (Figure 1). At the household level, financial services and their potential for improving the food security of poor households living in risky environments are identified. This is followed by an analysis of the services offered and the constraints faced by various institutions at the community and market levels. The final section investigates the role that macroeconomic policies and the regulatory framework can play in the development of financial markets.

Micro-Level Financing for Food Security

Understanding of the strategies adopted by households as they attempt to stabilize food consumption in highly risky environments has increased considerably during the past two decades. The pattern of household response to food crises generally involves a succession of stages along a continuum that runs from long-term risk management to crisis damage containment to the extreme instance of household

Figure 1—Levels of analysis

collapse (von Braun 1991a). Long-term risk management measures include savings and investment activities, diversification of household incomes, and establishment of access to interhousehold transfers through social support networks that encompass gifts, food-sharing, informal insurance, and credit.

The concept of financing for food security explores the potential of financial services for stabilizing consumption and reinforcing the household's wealth and income base. This is a much broader concept than that of providing credit for particular income-generating activities such as agricultural production and, more recently, off-farm micro-enterprises. Many credit programs and institutions narrowly focus on the enterprise or farm, without taking into consideration the socio-economic context within which the household or individual members invest, produce, and consume.

A broadened role of rural finance for food security addresses credit and savings needs for agricultural production and off-farm enterprises, but also includes other demands for financial services, such as financing food consumption and health care, as well as providing households with more effective savings, credit, and insurance services for smoothing consumption, holding precautionary savings, and diversifying the asset portfolio.

In this review, this broader role of rural financial intermediation for improving food security will be explored within the standard framework of intertemporal theory. The major arguments for smoothing consumption between two periods are reviewed on the basis of a two-period (current and future) household model with borrowing and savings. Variations of the model with respect to risk, borrowing constraints, precautionary savings, and intrahousehold resource allocation are discussed. Based

on this review of the theoretical literature, a framework is conceived at the household level that distinguishes three pathways by which access to financial services (or lack thereof) can influence the food security of households and individual members. These pathways set the framework for identifying institutional arrangements that address the diverse demands for savings, credit, and insurance services by the poor; for evaluating them; and for comparing their costs and benefits with alternative policy measures aimed at improving food security.

Basic Model

When households save for future periods, they forgo some consumption in the current period. When they borrow, whether for current consumption or future production, the costs involved are the interest plus the burden of repayment. When they adopt risk-reducing measures such as mixed cropping or use of multiple seed varieties, households pay a premium in additional work or lower yields for a reduction in the variance of expected yields or agricultural income, thereby stabilizing future consumption. When acquiring insurance or insurance substitutes, such as crop insurance or maintenance of a network of social relations, households pay an insurance premium for reducing the variance of or increasing the expected value of uncertain future income, consumption, and, hence, utility. These examples highlight the demand for financial services to stabilize consumption and generate income. The theoretical argument that consumption smoothing yields utility is well established.

Following the basic model of intertemporal behavior in a two-period framework (Deaton 1992; Gersovitz 1988), the household or individual disposes of an initial stock of assets and earns nonstochastic labor incomes in each of the two periods. The household can borrow and save at a given market interest rate. Because the planning horizon is finite, the household consumes all of its wealth by the end of the second period and is not allowed to hold any terminal debt. Assuming that the household wants to maximize its utility, and assuming that its preferences are intertemporally additive and separable, the following results are obtained.

If the household's time preference rate (its assessment of the future value of its money) and the market interest rate coincide, the household can completely smooth consumption either by divesting assets and borrowing or by saving during the first period. If the time preference rate is higher than the interest rate, consumption in the first period will be higher than in the second period. The reverse is also true.

The relationship between demand for credit or the propensity to save and the level of the interest rate is theoretically ambiguous. An increase in the interest rate will, first, make future consumption relatively cheaper than current consumption (this is the substitution effect). Second, it permits more second-period consumption with the same total

resources and without cutting first-period consumption (the income effect). The third effect, which Deaton (1992) termed the "human capital effect," occurs if labor income in the second period rises because higher interest rates reduce the discounted value of total lifetime resources. The first and third effects act to cut current consumption and borrowing and to increase saving, while the second effect, the income effect, works in the opposite direction. Because of the divergence between the substitution and income effects, the relationship between interest rates, on the one hand, and consumption, borrowing, and saving on the other hand, is theoretically ambiguous. The relationship then becomes entirely an empirical question. The magnitudes of the income and substitution effects are determined by the curvature of the utility function. Looking at aggregate household consumption of all goods and services, Deaton (1992) concludes that it is implausible for the substitution effect to be very large, and that the direction of the effect of interest rates on current consumption cannot be predicted on theoretical grounds. If there is ambiguity about these relationships at the micro level, this ambiguity, of course, remains at the macro level.

The basic intertemporal model under certainty shows that access to credit and saving options has the potential to increase a household's utility by optimally allocating consumption over time. The results imply that there is an economic demand for financial services for consumption smoothing and that households are willing to pay a certain price for these services.

Extensions of the Basic Model

The basic model laid out here is, of course, unrealistic. It has severe limitations in that it does not account for uncertainty and risk aversion, liquidity constraints, transaction costs related to borrowing and saving, consumption of basic necessities for survival, and abrupt changes in wealth or income due to idiosyncratic or covariate shocks.

Several theoretical models have been developed in recent literature that provide useful extensions of and additional insights into the explanation of short-term and life-cycle behavior of households. The recent literature concentrates on extensions of the basic model to include liquidity constraints and precautionary savings. This work, reviewed by Deaton (1991a), is briefly summarized next, highlighting the implications of these recent theoretical approaches for the relationship between access to financial services and food security.

Deaton (1992) integrates the insights gained from the earlier permanent income and life-cycle theories with the newer models, which attempt to account explicitly for the occurrence of credit rationing and precautionary savings. According to Deaton, the central problem of the permanent income and life-cycle models is that they assume away the existence of borrowing constraints. The models therefore predict that consumption equals the annuity value of initial assets and lifetime labor

income. Following these models, consumption does not follow income over time. It is hard to understand the relevance of these models, especially for rural households in developing countries that frequently face severe shortages of food and basic necessities during the preharvest season, despite having incomes averaged over several years, which should be sufficient to maintain access to food at all times. Limited access to efficient savings, credit, and insurance services can account for this widely observed phenomena in developing countries.

Precautionary Savings and Food Security. Apart from ignoring potential borrowing constraints, the permanent income hypothesis also assumes a quadratic utility function that rules out the explanation of precautionary savings. While it is intuitively obvious that savings provide insurance for future contingencies, the occurrence of precautionary savings, such as “cash under the pillow,” has been neglected in theoretical work until recently.

If the utility function is convex, an increase in uncertainty about future consumption will induce a reduction of current consumption and an increase in saving. In permanent income models, where the utility function is quadratic and marginal utility is linear, increases in uncertainty about the future do not, by themselves, affect saving or borrowing or consumption. Kimball (1990) distinguishes between risk aversion, the second derivative of the utility function, and prudence, the third derivative of the function. He proposes that the elasticity of the slope of the marginal utility function is a measure of prudence.

Convex marginal utility functions imply not only that the marginal value of consumption is higher when consumption is low, but also that the rate at which the marginal valuation rises with shortfalls in consumption should be greater when consumption is low than when it is high (Deaton 1992, 178).

It follows from the precautionary savings model that increases in uncertainty about future consumption will prompt individuals to save more. For example, this uncertainty can be caused by expected higher variance of future labor incomes, by a higher probability of consumption shocks (such as illness), or by rising uncertainty about the value of assets or their rate of return. While the permanent income hypothesis leads to savings that are solely determined by interest rates, models of precautionary savings allow for savings that are determined by greater prudence or by greater uncertainty about the future.

Carroll (1994) further points to the possibility that, under the precautionary savings motive, some individuals will never borrow. This potential case arises if the individual faces the probability that incomes in a particular period are close to zero, a reality for farm households in developing countries facing idiosyncratic risks, such as illness, and

covariate risks, such as drought. In addition, the individual must have a decreasing absolute risk aversion, a probable assumption. Not only can covariate risks wipe out individual income, but they can also severely constrain the transfer of income from the informal social security network, so that available transfers to the most severely affected households may not be enough to ensure a minimum subsistence. To avoid this real possibility, some households may voluntarily refrain from borrowing in order to avoid being in a debt trap when a harvest fails. Rather, they rely on precautionary savings, even if this means eating only once a day. Platteau (1995) emphasizes the often neglected point that poor people may be unwilling to take loans for fear of losing the assets that they have to offer as collateral. A higher probability of a loss of collateral leads to higher uncertainty about future consumption. The benefits of increased current consumption may then be outweighed by the discounted utility losses arising from increases in uncertainty of future consumption. Furthermore, in the case of covariate shocks, expected consumption credit limits for the individual—assuming a thin, isolated informal market—are likely to be lower than in normal years. In catastrophic years, no sizable amount of credit may be available in the village economy. Such a possibility again reinforces the demand for precautionary savings.

In summary, the precautionary savings model provides a useful extension of intertemporal theory, because it explains why the evolution of consumption is not independent from the evolution of resources over the life cycle. Precautionary savings are therefore an important response of the poor who face transitory food insecurity. The savings act like a buffer stock for smoothing consumption in the short run, while consumption over the life cycle basically follows the evolution of income and assets. While the precautionary savings motive emphasizes liquidity over return, the elasticity of savings with respect to interest rates is likely to decrease with the decreasing wealth of the household and with a higher risk of transitory food insecurity. The theory of precautionary savings also provides insightful linkages to a second recent group of theoretical models that explicitly treat the occurrence of credit constraints.

Credit Constraints and Food Security. Based on the pioneering work of Stiglitz and Weiss (1981), this theory explains why the interest rate cannot clear the credit market and why credit is rationed by lenders. Because of adverse selection of high-risk borrowers when interest rates rise, lenders prefer to hold interest rates low so as to protect the quality of the loan portfolio and, instead, clear the market by rationing loans. Thus, some households or individuals will fail to borrow, while others cannot borrow as much as they need.

In a cross-section of households at any point in time, four groups with different borrowing behaviors and credit constraints can be distin-

guished (Zeller et al. 1996). First, there is the group that voluntarily does not borrow, either because they have strong risk aversion and fear of getting into debt or because they are prudent and only want to consume up to what they earn (as is the case with the standard life-cycle consumer). Most consumers, however, will borrow at one stage during their life cycle. Among borrowers, there are those who want to borrow less than their combined available credit lines from all lenders and also those who want to borrow more than their available credit limit at a particular point in time. The former group is not credit rationed, whereas the latter is. The fourth group consists of nonborrowers who have no access to credit, or who perceive that they are highly unlikely to get credit, so that the transaction costs for loan application outweigh the expected value of the benefit of obtaining a loan (nonvoluntary nonborrowers).

As with any binding resource constraint, credit constraints induce opportunity costs. For nonvoluntary nonborrowers and rationed borrowers, credit constraints lead to utility losses. Voluntary nonborrowers and nonrationed borrowers do not face a binding credit constraint because they choose to borrow less than their available credit limits. However, anticipated future credit constraints can negatively affect the welfare of those households that do not face a binding credit constraint in the current period. Even if current credit constraints are not binding, current consumption will be more conservatively set if it seems likely that credit constraints in the future may be a problem.

If loan demand exceeds the maximum amount of credit available, the loan demand will be rationed or fully rejected. The credit limit available to a household is a function of its repayment capacity, which is determined by the available human, physical, and social capital controlled by the household (Zeller 1994). The repayment capacity and therefore the available credit limit for a certain household can fluctuate over time. The occurrence of idiosyncratic or covariate shocks affects the value of capital controlled by the household and its productivity. The credit limit will therefore fluctuate over time in response to household-specific shocks. Furthermore, if the household only has access to a thin credit market, where few lenders exist, the credit limit and other loan characteristics will also be influenced by the fortunes, good or bad, of potential lenders.

From the viewpoint of a household that may wish to borrow at some future point in time, the household's credit limit is an asset whose future face value is uncertain. Borrowing in the current period will reduce the expected value of the credit limit in the future period. Thus, borrowing to maintain food security in the current period comes at the expense of a greater likelihood of food insecurity in future periods as debt is accumulated and the remaining line of credit decreases. This is similar to the sale of assets in current periods, because this also reduces the capacity of the household to cope with food insecurity in future periods.

A useful conceptualization of the credit limit is given by Jappelli (1990). A household is credit-constrained if the following holds:

$$C_h^* - Y_h^* - A_h(1+r) > S_h, \quad (1)$$

where

C_h^* = optimal consumption over the life cycle of household h in the absence of credit constraints;

Y_h^* = net income of household h , where labor supply and other household inputs into income generation are at their optimal levels in the absence of credit constraints;

A_h = financial and other wealth; and

S_h = the credit limit, which is the maximum amount that potential lenders are willing to lend to household h on the basis of its repayment capacity and other characteristics.

Two factors determine whether the constraint binds: (1) how much the individual would like to borrow, that is, the difference between C_h^* and available resources; and (2) how much financial intermediaries are willing to lend to that individual, that is, S_h (Jappelli 1990). Without credit constraints, the optimal amount borrowed, B^* , is equal to the left side of equation (1): $C_h^* - Y_h^* - A_h(1+r) > S_h$. The household is credit-constrained if B^* is greater than the credit limit.

Binding credit constraints—whether current or future—create opportunity costs. The optimal levels of consumption, saving, and income of a household that faces the possibility of a binding credit constraint are different from and provide lower utility than the optimal levels without credit constraints (Feder et al. 1990). Compared with households that do not face credit constraints in current or future periods, credit-constrained households will hold, if possible, more precautionary savings and consume and borrow less in the current period. Since precautionary savings are held to increase the flexibility of the household for cushioning shortfalls in disposable income in the short run, these savings will be held in liquid form. Credit-constrained households will, therefore, not only hold more savings in absolute terms, but their share of liquid assets in total assets is expected to be higher. In a study by Zeller et al. (1993), households in the poorest income tercile in Madagascar were not only more likely to experience binding credit constraints, they also had a higher share of liquid assets in their asset portfolios. However, higher liquidity of an asset usually comes at the expense of the asset's return. Thus, households that invest in liquid assets are likely to invest less in remunerative but largely illiquid production durables, such as agricultural equipment, and also make fewer illiquid investments in human capital like sending a child to school.

Therefore, all things being equal, they are likely to realize lower incomes in both the short and long runs than households with no borrowing constraints. Apart from the indirect effect of credit constraints inducing liquid but low-yielding asset portfolios, credit constraints have a direct negative effect on the physical and human capital available for income generation.

The direct effect of credit in temporarily increasing the productive capital of households is well recognized. The direct effect has been the major, if not sole, rationale for rural credit policies in developing countries, while the indirect effect, as well as the demand for precautionary savings, has been seriously neglected. The lack of emphasis on savings in general, and the lack of emphasis on liquid savings services in particular, is the result of the past orientation of rural finance policies exclusively to credit supply. Both the direct and indirect effects of credit constraints are likely to have implications not only for the frequency and severity of transitory food insecurity, but also for chronic food insecurity and alleviation of poverty. The two effects not only force households to take a lower growth path than they would choose without credit constraints, but the frequency and severity of transitory food insecurity is also increased.

Consumption Credit Versus Production Credit. Consumption in the basic model may be differentiated into various types of goods, such as food, spending on health care, social obligations, and leisure. When faced with consumption crises for food and other basic nonfood items, time preference rates will temporarily exceed interest rates, leading to steep demand functions for credit in order to increase current consumption at the expense of future consumption. Furthermore, investments in human capital (choice of number of children and related expenditures on education) and physical production capital (land, trees, livestock, machinery, irrigation) could be specified in future extensions of the theoretical models in order to address the important issues of investment in human capital and maintenance of natural resources.

When access to credit is a binding constraint, it depends on the specific conditions of the household economy, such as size and age structure of the household, its wealth, and the market imperfections it faces, which are the most binding inputs in terms of utility. Clearly, pressing consumption needs such as hunger or illness induce high time preference rates and therefore impose immense opportunity costs on investments, such as holding and maintaining production durables, purchasing production inputs, preserving natural resources, or sending children to school. Critics of consumption credit often argue that credit should be used for income-generating activities in order to ensure the repayment of a loan. This is true in principal, but the productivity of a household economy depends not only on conventional production inputs and durables, but also on the skills, education, and

nutritional and health status of its family labor. Therefore, the use of credit for maintaining and enhancing human capital (for example, for physical labor, for education, for preventing mothers from having babies of low birth weight, and so forth) can be highly productive.

Since capital is fungible within the household economy—if one ignores for the moment the possibility of intrahousehold barriers to the allocation of resources—improved access to savings options and credit has the potential to affect all linkages between production, investment, and consumption, including health, education, and nutrition. Thus, directing credit to specific production activities is not only futile because of fungibility, as von Pischke and Adams (1980) convincingly argue, but also because it ignores part of the demand side, that is, the willingness to pay for specific credit and savings services that lead to more efficient smoothing of consumption.

Credit and Precautionary Savings as Insurance Substitutes. Providing access to credit and to liquid savings options may increase the risk-bearing capacity of households through increased credit limits and more efficient precautionary savings. Credit access and precautionary savings work in similar ways: both increase the resiliency of food-insecure households, although the costs and benefits of the two strategies will differ among different types of households and socioeconomic contexts.

Households with higher unused credit limits, or higher amounts of precautionary savings, will have a greater capacity to absorb risks and to pool these risks across periods, thus stabilizing consumption over time (Eswaran and Kotwal 1990; Alderman and Paxson 1992). This has important implications for developing countries, where formal insurance markets and social security systems are often nonexistent or at least not accessible to the rural poor (von Braun 1991b). Informal systems of reciprocal self-help and exchange based on social capital can be an important means for the poor to stabilize their consumption in the event of shocks. Social capital is defined as features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefits (Putnam 1993, 35). However, community-based social security networks are constrained in their ability to cope with covariate risks such as droughts or price shocks (Binswanger and Rosenzweig 1986; Teklu, von Braun, and Zaki 1991; Platteau 1995). For example, migration of family members and transfer of remittances is often used as a way to deal with covariate shocks.

The lower risk-bearing ability of poor households tends to favor well-known production practices and hinders the adoption of new technology. As a result, potentials for productivity increases remain unexploited. Poor households often lack access to formal credit (Binswanger and Sillers 1983). They must turn to the informal credit market, where they often face credit shortages. Informal interest rates vary greatly,

depending on the relationship between borrower and lender. When access to credit from friends and relatives is depleted, real interest rates per year often exceed 100 percent. Poor households usually borrow at such high interest rates only to smooth consumption. As a result of the lack of access to credit in the formal sector, productive assets of poor households are depleted, assets used as collateral are transferred from the poor to wealthier households, and households may become more food insecure and impoverished. On the other hand, many rural households may never demand a formal loan because they lack profitable investment opportunities or they may not find the type of formal credit service that suits their specific demand.

Households' Asset Portfolios. Decisions to hold assets from one period to the next are complex. They depend on the risk-bearing ability and risk exposure of households and the imperfections of commodity, labor, and intertemporal markets. Households evaluate different forms of investment in terms of security, liquidity, and economic return. They seek to hold wealth in a secure form, to earn returns on the saved asset, and to have flexibility in withdrawing or disinvesting an asset when there are opportunities for higher returns, including those from consumption of food.

From the discussion of the model of precautionary savings, it follows that in food-insecure households, risk-reducing, liquid, and divisible forms of savings are preferred over high-yielding, risky, illiquid, or lumpy assets. Household saving strategies tend to be less risky and more liquid; the lower the household's wealth and risk-bearing ability, the higher its exposure to consumption, production, and market risks and the lower its access to credit and insurance services. Because of diseconomies in scale, these saving strategies are also guided by disproportionately high unit transaction costs among the poorer households for investing in and liquidating assets.

Households respond to risks, including food insecurity, in different but interdependent ways:

- Saving: households hold assets with preferably uncorrelated returns (such as rainfed upland and irrigated lowland), and they hold precautionary savings in the form of low-risk, liquid assets (diversification of the asset portfolio *ex ante*, that is, before the risk or shock occurs).
- Risk-reducing behavior: households adopt strategies suitable for reducing the probability of a risk occurring (for example, vaccination of children, irrigation investments) or decreasing *ex ante* or *ex post* (after the shock has occurred) the effects of risks on household outcome variables (by using risk-reducing inputs such as pesticides, diversifying income generation, or encouraging migration of family members, for example).

- Investment in market access and social capital: households secure access to credit, insurance, labor, land, and commodity markets in order to maintain the flexibility to adjust the level and use of assets controlled by the household. Examples of this strategy include seeking patron-client relationships, such as that between landlord and tenant, to establish secure access to consumption credit and land, and lending or giving gifts to neighbors and friends, that is, investing in informal social safety-net systems.

The first two strategies, that is, precautionary savings and ex-ante risk-reducing behavior (such as insurance), are, to some extent, substitutes. While savings increase the capacity to bear risks, risk-reducing strategies are aimed at decreasing the probability of occurrence or the impact of risk factors. These strategies become relatively more important for households whose access to intertemporal markets or to labor, land, and commodity markets is low or uncertain. Improved access to financial services can therefore be expected to alter the household's asset portfolio by substituting access to formal credit and liquid, remunerative monetary savings for liquid but nonproductive assets. Furthermore, increases in the credit limit provided by the formal sector may act to reduce the need to hold precautionary savings, which tend to yield low, sometimes negative returns because of their high liquidity.

Intrahousehold Resource Allocation, Access, and Participation. Allocation of resources among household members determines the degree of equality in individual welfare. Empirical studies of the effects of improved access to financial services on intrahousehold resource allocation and individual welfare are scarce (Nojonen 1992). Empirical evidence focusing on distribution of benefits within households shows that changes in household welfare may not induce similar changes in individual health, nutrition, or education levels (Kabeer 1992; Thomas 1994; Thomas and Chen 1994). Several studies, for example, have shown that increases in women's income significantly raise expenditures that lead to improvement of nutritional status of children (Haddad, Hoddinott, and Alderman 1997).

The effects of improved access to financial services on nutrition, health, income, and wealth of households may depend on which household member has access to financial services. If the levels of welfare or the distribution of welfare among household members can be improved by enhancing the access of particular household members, notably women, to financial services, targeted credit programs may be called for over and above the need for economic empowerment of women.

A household member's access to formal and informal financial markets depends on a range of societal, community, household, and individual variables. Major individual variables are gender, age, educa-

tion, and the individual's control over income and over assets suitable for loan collateral. Major household determinants are expected to be its size, its structure, its social status within the community, and its economic activities and wealth.

Given that he or she has access to financial services, the extent of participation of a household member in borrowing and saving may depend on

- who has the power to make decisions allocating credit to the various production, consumption, and investment activities;
- who benefits from the additional income generated; and
- who bears the risk and burden of loan repayment (individual versus household collateral).

Access to credit or the capacity to save is mostly determined by ownership or control of assets (including human capital). Assets held by households can be owned by the household or by its individual members. Other resources may be temporarily supplied by clan or community leaders, by relatives and friends, or through patron-client relationships. Most of the households will have a mixture of communal, familial, or individual ownership, or user rights (Wilk 1989). However, only assets owned by the household and its members can suitably serve as loan collateral or be invested in savings. In land-rich, labor-scarce societies found in Africa and, to a lesser extent, in Asia, labor is often used to secure access to credit. Poor households pawn their labor and obtain, in exchange, credit during the hungry season.

Depending on culture and society, household members may also borrow from each other. Internal borrowing and lending might be an important form of consumption smoothing in households that have skewed distribution of individually owned assets. However, few studies have so far focused on individual ownership and the resulting internal resource flows within households.¹ Intergenerational transactions and related implicit contracts are part of these intrahousehold resource transfer activities.

In societies where access to financial markets; the power to allocate assets to consumption, production, and investment activities; and the risk burden as well as the benefits from external financial transactions are unequally distributed among the household's members, the notion of fungibility of capital or credit within the household economy must be questioned. For example, credit in the form of fertilizer or cash may benefit the crop income and consumption of a particular member so that neither the borrowed capital nor the gain in income will be

¹One study that addresses these issues is Webb 1989.

pooled among members. If this is the case, fungibility of borrowed funds would only occur within the individual's budget, not within the household's budget.

Systematization of Effects of Access to Credit and Saving Options.

Based on the previous review of theoretical approaches, the three pathways through which improved access to financial services affects household food security can be conceptualized as follows:

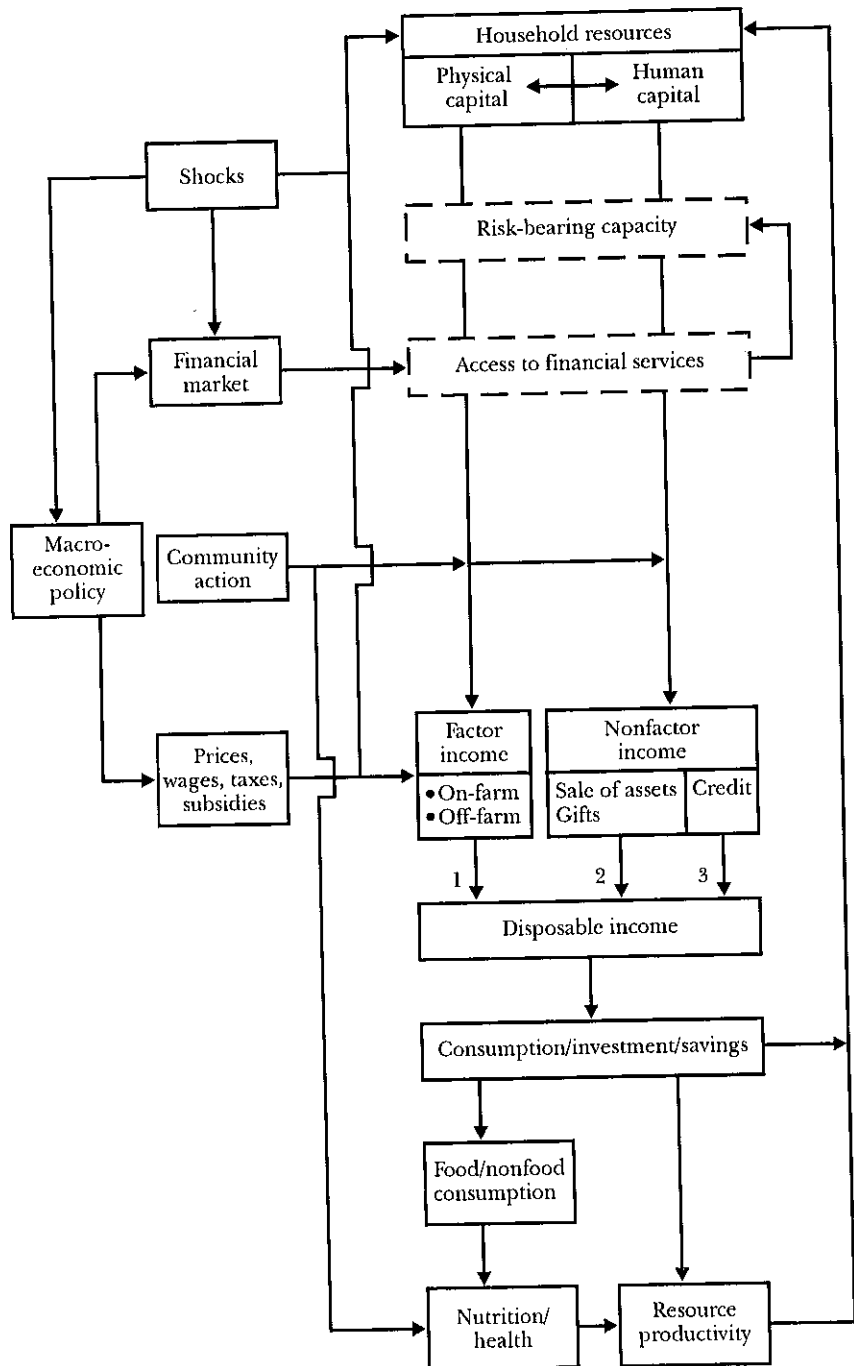
- Pathway 1 is via income generation,
- Pathway 2 is via asset investment or disinvestment strategies to smooth disposable income over time at sufficient food consumption levels, and
- Pathway 3 is via direct use of credit to finance immediate consumption needs.

In Figure 2, the process is depicted through the linkage of boxes. Each of the boxes indicates a subcomponent of the overall process of altering household food security through improved access to credit, insurance, and saving options. Time subscripts are not shown, but the process is perceived as dynamic.

Pathway 1: Improved income generation. The hypothesized effects of access to credit are twofold. First, additional capital can be temporarily used to enhance the level of the household's productive human and physical capital. This is the traditional argument for credit. Second, apart from this direct effect on factor income, access to credit and savings services suitable for precautionary savings increases the risk-bearing capacity of the household (Eswaran and Kotwal 1990). This favors more risky but potentially profitable income-generating activities, partially substituting for traditional risk-coping measures, such as crop diversification and field fragmentation.

The allocation of credit to specific uses is determined by the level of opportunity costs in the various consumption, production, and investment activities. In general, the opportunity costs of capital-intensive assets are reduced relative to family labor, with improved access to credit. For example, instead of growing low-yielding local crop varieties with low input and capital intensity, improved access to credit may lead to an increased use of improved seeds and to a higher crop output per unit of labor. This may, in turn, encourage labor-saving technologies, such as animal draft power in crop production and equipment for crop processing. As a result of its positive effect on risk-bearing capacity, access to credit may also enhance the adoption of new, more risky technologies and enable the household to expand

Figure 2—Access to financial services and its effects on household food security



agricultural or nonagricultural microenterprises (Feder, Just, and Zilberman 1985).

Access to credit and savings schemes may therefore alter the profitability and mix of agricultural, nonagricultural, and household activities through changing opportunity costs of family and hired labor, inputs and durables, and consumption items. The expected increase in income will contribute to the formation of human and physical capital, leading to potential second-round effects.

Pathway 2: Decreasing costs for self-insurance through more cost-efficient assets and liabilities of households. Improved access to credit, insurance, and savings services may induce the following hypothesized changes in the household's composition of assets and liabilities:

- Holding of assets with lower risk-adjusted returns may decrease. Traditional forms of savings such as cash, jewelry, staple food, or livestock are exposed to various risks (inflation, theft, loss, or disease). They are likely to be partially substituted for if saving opportunities with higher risk-adjusted returns arise. This response, however, is conditioned by the quality of the food and labor markets to which the household has access. For example, if food markets during the hungry season are thin and food prices are expected to be highly volatile, households may continue to save in the form of food, even if formal saving options with high liquidity and low transaction costs are accessible. This example highlights the importance of financial products that are adapted to the local socioeconomic environment.
- The level of assets held for precautionary savings may decrease.
- Investments in and allocation of human and physical capital to current and future income generation, as discussed in Pathway 1, may increase.
- The level of credit obtained at high cost from informal sources may decrease.
- Emergency sales of productive assets at low prices may decrease. Thus, a depletion of productive assets such as land, livestock, and seeds may be avoided. In turn, storage of crops for later sale at higher prices may increase with improved access to credit.

In summary, improved access to credit and innovative savings and insurance schemes may alter the structure of assets and liabilities of households. The expected cost reduction for consumption stabilization may make more household income available for financing consumption, production inputs, or investments, and mobilizing unproductively held resources for economic growth.

Pathway 3: "Consumption" credit. Households attempt to smooth their consumption by adjusting their disposable income. If factor income is insufficient because of shocks, various traditional consumption-smoothing techniques are used to generate nonfactor income, for example, through the depletion of stocks, the sale of assets, and the call for gifts or loans from relatives and friends. Factor and nonfactor income constitute total disposable income for consumption and investment.

Nonfactor income for stabilizing consumption in the current period can be generated by borrowing. Access to credit has the potential to substitute for some higher-cost traditional saving, self-insurance, and community-level coinsurance strategies, as well as substituting for some of the higher-cost informal credit sources. Credit and savings services may be particularly in demand where interannual and seasonal income fluctuations are considerable.

Traditional targeted production credit focuses exclusively on a reduced version of Pathway 1 by disbursing credit for "income-generating, productive" assets, such as fertilizer, seed, or machinery. To prevent the diversion of loans to other uses, loans are often disbursed in kind. However, when household consumption needs, such as for food, health, and education, which may be highly productive, and the perceptions of credit project officers about needed uses of loans do not coincide, in-kind disbursements will not succeed in restricting loan use, but simply increase the transaction costs of diverting loans to uses with higher economic returns. This practice can therefore reduce the net economic benefit of the financial transaction (von Braun, Malik, and Zeller 1993).

In summary, it is likely that rural financial policies will perform better in alleviating poverty and contributing to food security and economic growth when all three pathways are pursued. The broader role for rural finance encompasses all of the pathways shown in Figure 2, not just the direct effect of credit on income generation and the mobilization of savings for lending to more efficient users of capital. Recent theoretical models of precautionary savings and of credit constraints support this broader agenda. In formulating future rural financial policies, savings and insurance services will have to be emphasized much more, in addition to credit. In developing savings products for the rural poor, it follows that more emphasis should be placed on liquidity and low transaction costs than on attractive interest rates. Providing financial services to enhance food security is part of traditional "production" credit, for either agricultural or off-farm enterprises. In addition, rural finance policy—if it is intended to be relevant for the food-insecure—should address the demand for credit, savings, and insurance services for consumption smoothing. Institutional and other constraints, however, may limit the role of the formal sector in providing a broader array of financial services, many of which are traditionally provided by the informal sector. These constraints and policies for addressing them are discussed next.

Community Institutions and Markets

Rural markets and institutions at the community and higher levels establish the crucial link between changes in macroeconomic and sectoral policies and their effects on the food security of the rural poor. The design of sustainable policies for rural financial intermediation must be based on an understanding of the structure, conduct, and performance of the existing rural financial markets. The conceptual framework addresses the following questions:

- What functions do informal and formal financial institutions perform? What is the relative importance of different market segments in fulfilling these functions?
- Which specific constraints exist in the development of rural financial institutions, and how do they affect the role and performance of financial institutions in improving food security, that is, promoting income generation and consumption stabilization in risky environments?
- What kinds of institutional arrangements in the informal market and innovations in the formal market exist to potentially overcome these constraints?

In the following section, the functions of financial markets are discussed first under the assumption of competitive markets. In view of market imperfections, additional functions of financial intermediation and specific constraints of the financial market are elaborated. This also includes a review of functions performed by informal financial institutions. The section concludes by discussing group credit as one form of institutional arrangement that builds on locally available information at the community level to alleviate the constraints to provision of financial services to the poor.

Basic Functions of Rural Financial Markets

Considerable theoretical progress has been made in recent years to explain the phenomena of missing financial markets and the occurrence of credit rationing. However, economic theory is only beginning to explain why rational agents cannot always create efficient resource allocation and institutions when needed (Stiglitz 1989a).

Under the unrealistic assumptions of perfect information and competition, neoclassical economic theory postulates that rational behavior leads to the formation of efficient markets and institutions and allows for instantaneous adjustments when disequilibria occur. The functions of financial markets in such a world would be

- to facilitate the mobilization of capital from savers, and
- to efficiently allocate this capital among borrowers so that marginal productivity of capital is equal in all uses throughout the economy.

The mechanism for allocating capital is based on the concepts of demand and supply functions where the equilibrium interest rate and the quantity supplied and demanded are simultaneously determined. These two functions, mobilization and allocation of capital, are basic to any financial market and essential for economic growth. Under imperfect, real-world circumstances, the actual functions of financial markets are more complex and manifold.

Despite the considerable effort under way to advance institutional credit, various segments within the informal market remain in place. While friends and relatives often do not demand any interest payments, socially distant lenders charge real interest rates that are frequently more than 100 percent per year. The phenomena of informal markets that persist in most developing countries, and also in rudimentary form in developed countries, can only be explained by the fact that informal financial markets serve additional functions that are not fulfilled by formal institutions. To improve the performance of formal finance, these additional functions must be identified.

Additional Functions Assumed by Rural Financial Markets

Risk-Pooling among Savers, Borrowers, and Intermediaries. The principle of capital allocation based on equilibrium interest rates has been seriously questioned in recent research. Interest rates perform a price function, but they are also an instrument for regulating the risk composition of the lender's portfolio (Stiglitz and Weiss 1981).

Capital can also be allocated in a way that is risk-efficient for borrowers, savers, and financial intermediaries, by establishing a market with a large number of borrowers and savers, so that market participants will be exposed to different, preferably noncovariate risks, and so that they will have different attitudes toward risk and different risk-bearing capacities. The risk aversion and interest policy of a particular financial intermediary, such as a rural bank or cooperative, partially determines the riskiness of its portfolio. Given economies of scale in any particular risk portfolio strategy and the high transaction costs of switching from one portfolio or type of client to another, this will lead ultimately to specialization in various market segments. Financial intermediaries will differ in the size and composition of their portfolios and serve client groups with differing risk aversion and risk-bearing capacities.

Such markets have been established in developed countries. Most developed-country governments influence the composition of the

portfolio of the financial intermediaries through special banking laws regulating liquidity reserves and security requirements. However, an integrated financial system that pools the risks of financial investments across market participants and between urban and rural areas does not exist in many developing countries. Risk-pooling among savers and borrowers is often limited to the community (Platteau 1991). Informal borrowing and lending along kinship and friendship lines only efficiently pools risks that are borne by the individual (Townsend 1995; Lund 1995). Risk-pooling at the community level cannot easily manage covariate risks that affect everyone in a community, such as drought, failure of local markets, or epidemic human, crop, or animal diseases (Binswanger and Rosenzweig 1986). This argument holds also for traders and moneylenders who work in only a few communities where they have sufficient knowledge of their clients. Basu (1983) emphasizes the geographical isolation of informal credit markets.

The formal financial market has the potential to pool covariate risks among urban and rural savers and borrowers. The state is in a position to spread the fixed cost of establishing insurance markets (Dasgupta 1993). However, this potential is poorly exploited in most developing countries.

Insurance—The Forgotten Third of Rural Finance. Whereas saving was termed the forgotten half of rural finance in the 1980s, insurance may well be considered the forgotten third during the 1990s (Zeller 1995). Exceptions, of course, exist, as is shown in the review of innovative programs in Chapter 4.

The imperfections in the rural capital market of many developing countries may seriously limit households' options for smoothing consumption from one period to the next, accumulating capital, and financing lump-sum investments. The lack of formal insurance markets that are accessible to rural people may further impede households' ability to achieve food security and growth. The lack of options to acquire insurance prevents households from reducing the variance of future incomes and from avoiding food insecurity by paying an insurance premium in the current period.

However, many informal financial institutional arrangements provide insurance services. The most important arrangements are reciprocal gift and loan exchange systems within the "moral economy," that is, among relatives, friends, and neighbors (Scott 1972; Wade 1988; Platteau 1995; Rosenzweig and Stark 1989; Townsend 1989), or through interlinked contracts (Bardhan 1980; Bardhan 1989; Bell 1988; Bhaduri 1977; Mitra 1983; Otsuka, Chuma, and Hayami 1992). A common characteristic of both types of institutional arrangements is that they address the problems of information asymmetry and moral hazard by establishing long-term relationships between the partners. The institutional arrangements tend to reduce information asymmetry

between market partners through repeated economic and social interactions: interlinked contracts and membership in mutual self-help groups are sometimes even passed on to the children of both market partners. The risk of moral hazard in the intertemporal exchange of labor, goods, and financial services is reduced through the potential loss of future transactions with the partner.

Risk-Pooling and Insurance in Informal Institutional Arrangements.

Rural households respond to their high-risk environment by setting up institutional arrangements at the community level that assume the functions of risk-pooling and insurance, in addition to the mobilization and allocation of capital.

The most common savings and credit arrangements in developing countries, the socioeconomic characteristics of the participants, and the main functions being performed are shown in Table 1.² Based on the degree of social cohesion between individuals,³ institutional arrangements are divided into two types (Zeller et al. 1994). Most savings and credit arrangements are made within the moral community, which comprises all implicit or explicit transactions between individuals or groups, based on social cohesion, trust, and social dependence. These savings and credit transactions regularly carry no interest fees and require no loan collateral. As social distance between agents increases, institutional arrangements are characterized by the payment of interest rates and the pledge of collateral or the use of interlinked contracts as collateral substitutes.

Within the moral community, participating agents have numerous social, ethnic, and economic relations with each other.⁴ Problems of information asymmetry and moral hazard, therefore, tend to be low. Contracts for savings or credit transactions are usually implicit and take place between household and compound members, relatives, friends, and neighbors. There is often no interest paid for savings deposited or for credit received. Most save in order to have funds in an emergency, and the value placed on liquidity appears to be high. Credit is usually advanced for consumption smoothing and performs the function of insurance and coinsurance for a variety of individual risks. The maturity of the loan is often not fixed, or if it is, it can be rescheduled. However, the system of reciprocal exchange of gifts and interest-free loans is not costless. It bears implicit costs that arise from

²For a summary table of informal savings and credit arrangements in developing countries, see also Germidis 1990.

³On the linkage of social distance between market partners and the conduct of market transactions, see Robison and Schmid 1988.

⁴For further discussion of informal insurance and the term "moral community," see Scott 1972; Platteau and Abraham 1984; Besley 1992; and Coate and Ravallion 1993.

maintaining the access to future insurance services by providing gifts and loans during good times.

Group-based savings and credit arrangements are performed by informal credit and savings associations (Geertz 1962; Schrieder and Cuevas 1992; Slover 1992). These arrangements provide a means to accumulate savings and to finance larger individual or group investments. The associations frequently pool risks such as individual crop failure or illness among the group's members. The groups can be very small or large. The degree of social cohesion between members diminishes as the size of the group increases.

With decreasing social cohesion between individuals, problems of information asymmetry and moral hazard are more likely to occur. To offset rising transaction costs, contracts often carry high interest rates and become more commercially oriented.⁵ To reduce informational problems, lenders prefer to disburse credit to borrowers with whom they have an ongoing exchange of land, labor, or commodities (Bardhan 1989; Slover 1992). Default risks and lenders' efforts to screen and enforce loan repayment tend to be higher. Hence, there is a need for higher interest rates to cover these costs. Lender and borrower often share risks in sharecropping and consumption credit arrangements between landlord and tenants (for example, see Kotwal 1985; Bardhan 1989; Otsuka, Chuma, and Hayami 1992).

In summary, the institutional arrangements in the informal market provide a variety of options for savings, insurance, risk-pooling, and credit services. With increasing social distance and information asymmetry between agents, transaction costs and interest rates rise, and collateral substitutes such as interlinked contracts are used. Most of the informal financial arrangements are individual, decentralized transactions between borrowers and lenders, or are collectively decided transactions within groups at the community level. Interregionally active financial intermediaries are seldom involved (Platteau 1991). The informal institutional arrangements are generally less suited for inter-regional and intersectoral financial intermediation and risk-pooling.

Considering that the additional functions performed by informal arrangements are especially attractive for the poorest of the poor, a useful working hypothesis for the design of financial policies and programs is that rural finance policy for enhancing food security of the poor must either (1) directly address the demand for insurance and risk-pooling services, or (2) establish linkages between informal

⁵Empirical evidence points out that interest rates between socially close community members are often zero, whereas the amount-weighted average real interest rates per year for loans received from outside the moral community usually exceed 50 percent. See, for example, von Braun, Malik, and Zeller 1993 and Zeller et al. 1994.

Table 1—Informal savings and credit arrangements in developing

Institutional arrangements	Borrower/ saver	Financial intermediary
Mostly within the "moral" community (often no interest or collateral)		
Contracts between individuals based mostly on social cohesion	Household members, relatives, migrants, friends, neighbors	...
Group-based contracts (implicit and explicit): savings arrangements, combined savings and credit arrangements, communal work/food stores (partially based on social cohesion)	Savings associations, rotating/ nonrotating savings and credit associations, communal work groups	Sometimes
Within and across communities (often with interest and collateral)		
Commercial-type credit/savings contracts		
Not interlinked	Households	Private deposit-collectors sometimes involved
Interlinked with transactions of		
Land	Land-poor rural households	...
Labor	Land-poor rural households, migrant farm labor	...
Commodities	Businesses, food-insecure households	...

Source: Adapted from Zeller et al. 1994.

Note: Leaders (. . .) indicate not applicable.

arrangements and formal institutions in order to address the informal market deficiencies in pooling risks across regions, while at the same time benefiting from the additional functions provided by informal arrangements.

An example of the first strategy is the formation of formal groups at the community level that explicitly offer insurance services, such as the life insurance and emergency group fund provided by the Bangladesh Rural Advancement Committee, a large nongovernmental organization. An example of the second strategy is the formation and training of groups that are linked to the commercial banking sector (Seibel 1985; Seibel, Bassele, and Michell-Auli 1994). Chapter 4 discusses these and other examples of innovative institutional arrangements in detail.

countries

Lender	Main functions of institutional arrangement	Link to formal financial market
Clan or village members, relatives, migrants, friends, neighbors	Insurance, coinsurance, risk-pooling, consumption smoothing	Normally none
Members, where applicable	Community projects, savings accumulation, production and consumption credit, social security network, coinsurance between members	Funds occasionally deposited at formal institutions
Professional moneylenders, private deposit-collectors	For both interlinked and noninterlinked arrangements: savings accumulation, consumption smoothing, consumption and production credit, reduction of transaction cost in credit and interlinked markets, interlinked contract serves often as the poor's collateral to obtain credit	For both interlinked and noninterlinked arrangements: sometimes
Village heads, land-rich households		
Land-rich households, businesses, traders, shopkeepers		
Farm input dealers, processors, marketing institutions		

Constraints to the Formation of Rural Financial Institutions

In the past decade, there have been major advances in the theoretical understanding of institutions performing financial services (Bardhan 1989). Three major constraints to the formation of sustainable institutions in intertemporal markets have been identified: information asymmetries, lack of suitable collateral, and resulting high transaction costs.

Information Asymmetries. According to Hoff and Stiglitz (1990), when lenders have imperfect information concerning the ability and willingness of potential borrowers to repay the loan, three problems arise:

- Screening: borrowers differ in the likelihood that they will default, and it is costly for the lender to determine the default risk of each borrower. “Information asymmetries” exist between borrower and lender because the borrower knows whether he intends to default, while the lender does not.
- Incentive: it is costly to ensure that borrowers take those actions that make repayment more likely.
- Enforcement: it is difficult to compel repayment.

This research view holds that it is the market’s response to these three problems that explains many of the observed features of rural credit markets, and that they must therefore guide the policy in designing specific interventions.

From the viewpoint of rural savers, information asymmetries also exist between the saver and the financial intermediary or investor. Again, this implies screening, incentive, and enforcement problems involving the saver. Similar problems exist, of course, in insurance contracts.

Lack of Collateral. Lenders attempt to overcome the problems of information asymmetry and moral hazard by demanding collateral that they can seize in case of loan default.

Collateral basically has four effects (Binswanger, McIntire, and Udry 1989). At a given interest rate, (1) it increases the expected return (and reduces the variance of return) for the lender; (2) it partly or fully shifts the risk of loss of the principal from the lender to the borrower; (3) it provides additional incentives for the borrower to repay the loan; and (4) it has a screening effect on the applicant pool, discriminating against poor but often creditworthy loan applicants with little or no suitable collateral.

Lack of suitable assets for collateral (such as savings deposits or land) is frequently stated as one of the reasons why the poor cannot obtain formal credit. Formal lenders require assets as collateral that can be appropriated by the lender in case of default. The assets must not be subject to specific collateral risk of damage, disease, or theft, and the returns from the asset must accrue to the borrower, who will have an incentive to pay back the loan. These requirements imply that many rural poor in developing countries do not have adequate collateral. Innovative finance programs, described in Chapter 4, are being developed to circumvent these constraints.

Because the rural poor lack such collateral, informal financial markets use substitutes for collateral (Binswanger, McIntire, and Udry 1989) such as

- monetary savings deposits with lender;
- tied contracts (specific credit cum labor, cum land, or cum marketing arrangements in which the lender gains control over part of the production or production resources of the borrower);

- third-party guarantees;
- threat of lost access to future borrowing opportunities; and
- social sanctions of household members, extended family, or community.

In order to secure repayment of credit provided to the poor, the formal market has to develop innovative approaches with suitable collateral substitutes.

Transaction Costs. Transaction costs include any costs involved in an exchange of assets or services other than the price of the asset or service itself. The price of borrowing or saving is the interest rate. Transaction costs in financial markets are, to a large extent, a result of information asymmetries between the market partners.

High transaction costs are major impediments for catering financial services to the poor. Since transaction costs have the character of fixed costs, smaller transactions (that is, smaller loans and savings deposits) need to bear higher transaction costs per unit of money borrowed or saved. Irrespective of whether the borrower (saver) or the financial intermediary bears the larger share of costs, this will result in a market bias toward larger loans and savings deposits and therefore a bias against the poor, who will request only small loans and deposit little at a time.

Rural finance for the poor calls for institutional innovation to lower transaction costs of borrowers, savers, and financial intermediaries. Hoff and Stiglitz (1990) give examples of policy instruments that can reduce information costs, a major component of transaction costs in financial markets. These policies are land titling, development of markets, distribution of market information, investment in rural infrastructure, and promotion of institutions that facilitate information transfer in rural credit markets, such as group-based lending and saving. Among these policy options, the titling of land, especially in the communal land tenure system of Sub-Saharan Africa, is difficult to implement and may have adverse effects on income distribution in rural societies. The second and third options, development of markets and rural infrastructure, ought to be an integral part of any long-term development strategy. However, these options cannot by themselves effectively tackle the constraints of information asymmetry, moral hazard, and resulting high transaction costs that jeopardize the development of rural financial markets. The experience with the fourth option, group-based systems, is mixed when judged by their repayment rates (Huppi and Feder 1990). However, recent reviews of relatively successful rural finance institutions for the poor in Asia, Sub-Saharan Africa, and Latin America show that all programs employ institutional arrangements with participatory screening, monitoring, and enforcement functions (Gurgand, Pederson, and Yaron 1994; Christen et al. 1995; Yaron 1992b). A common characteristic of these programs is that member-based institutions, such as credit groups, village banks, and cooperative societies at the community level, provide

the institutional linkage between the individual borrower and saver and the banking and cooperative sector.

The structure of a rural financial sector is characterized by several tiers. The first tier is composed of wholesale banking institutions, such as headquarters of commercial banks, agricultural development banks, or cooperative banks. The second tier consists of retail bank branches of parastatal, commercial, and cooperative banking institutions. The third tier is made up of member-based financial institutions at the community level that exploit information that is available at relatively low cost within the community where savers and borrowers reside. When member-based institutions are employed as a third tier of the rural financial system, the transaction costs of the financial intermediary for screening borrowers and insurees and for enforcing compliance with financial contracts can be, to a large extent, transferred from the formal second-tier institution to the member-based institution. This transfer of transaction costs can often be efficient, since the member-based institution usually has a cost advantage, compared with a socially distant formal institution, so that the overall transaction costs of the rural financial system decrease. Compared with individual contracts between the borrower and a second-tier retail branch of the banking sector, the transaction cost of the individual borrower or saver could potentially be lower. Most, if not all, member-based institutions build on the principle of repeated economic transactions. This provides a strong incentive for members to honor implicit and explicit contracts as they gain continuous access to formal financial services through the member-based institution.

Recent research has made major advancements in theoretical understanding of these institutions, particularly credit groups. Many of the principles of credit groups—such as exploitation of locally available information; social cohesion and social sanctions; and collectively decided monitoring, screening, and enforcement actions minimizing the risk of moral hazard and free-rider problems—are applicable to other forms of member-based institutions.

Institutional Arrangement of Credit Groups: Review of Theory

Since the 1970s, group lending programs have been promoted in many developing countries.⁶ A common characteristic of group lending is that the group obtains a loan under joint liability, so each member is made responsible for repayment of loans of his or her peers. Most schemes give subsequent credit only if the group has fully repaid its previous loan. Perhaps even more than joint liability, the threat of losing access to future credit encourages members to perform various functions, including screening of loan applicants; monitoring the individual

⁶ The following section is based on Zeller 1996.

borrower's efforts and fortunes, good and bad; and enforcing repayment of peers' loans.

In group-lending programs, the functions of screening, monitoring, and enforcing of repayment are, to a large extent, transferred from the bank agent to group members. The financial intermediary reduces recurrent lending transaction costs by replacing a multitude of small loans to individuals with a larger group loan (Bhatt 1988; Adams 1988). This reduction in transaction costs enables financial intermediaries to do business with poorer loan applicants, who demand small loans and who would not be offered any credit under an individual loan contract because unit transaction costs of tiny loans are excessive. Thus, the bank can potentially realize economies of scale through group lending, while poor households gain access to formal loans. The households may incur significant transaction costs, however. These are mostly time costs, because many programs stipulate that group members must attend frequent meetings for training and supervision.

The cost of forming and training the groups constitutes a significant initial investment. In most if not all group-lending programs, these start-up costs are at least partially covered by government or donor funds, as banks appear, so far, to be unwilling to shoulder the investment risks of forming member-based financial institutions at the community level. Banking institutions cannot be assured that the group, once formed, will maintain a long-term business relationship in order to amortize the bank's investment in human and institutional capital. The group may well decide, in the future, to switch to a competing financial institution that offers more attractive services. Many programs try to avoid such disloyal client behavior by restricting members from participating in other group-based credit and savings programs. The enforcement of these restrictions has proven difficult and costly in practice: members of one group often contract with other programs, and sometimes an entire group switches from one program to another. The possibility of switching from one program to another could inhibit private investors from forming a network of groups, since they cannot be sure that they, rather than their competitors, will reap the benefits of this investment (Zeller 1996). This kind of market failure in institutional formation constitutes a possible argument for public investment in the formation of member-based financial institutions at the community level.

Probably the most important rationale for group lending is the information and monitoring advantages that member-based financial institutions at the community level have, compared with individual contracts between a bank and borrower. Stiglitz (1990) and Varian (1990) discuss these perceived advantages of collective action in screening loan applicants and monitoring borrowers. The main argument is that, compared with socially and physically distant bank agents, group members obtain, at a lower cost, information regarding the reputation,

indebtedness, and wealth of the loan applicant and about his or her efforts to ensure repayment of the loan. Zeller (1994) shows that members of formal groups—like informal lenders—consider the peer's indebtedness in the informal market as a major determinant of credit rationing. Thus, group members are able to obtain sensitive information just as informal lenders can.

In addition, groups may have a comparative advantage in enforcing loan repayment. Given the limited legal systems in rural areas of developing countries, the formal lender usually has few options to compel repayment from delinquent borrowers. Nonresident bank agents have little leverage and perhaps little incentive to actually go to a village and seize collateral. Group members can potentially use social sanctions or seize physical collateral from the defaulter (Besley and Coate 1995). Furthermore, group members appear to be in a much better position to find out the reason for a default. This cost and information advantage can greatly reduce the likelihood of moral hazard, and thus the group may be able to offer insurance services to members who are experiencing shocks beyond their control.

On the other hand, several factors can undermine the repayment performance of group lending under joint liability. First, since the risk of loan default by an individual is shared by his or her peers, a member may choose a riskier project than he or she would with an individual contract, counting on other members to repay his or her loan. To avoid this adverse selection of risky projects, peers can opt to assess the riskiness of each other's projects. Second, repayment incentives for a good borrower may vanish under joint group liability if a member expects that significant numbers of peers will default. Besley and Coate (1995) point out, therefore, that group lending has both positive and negative effects on repayment rates. In each loan cycle, a group member will compare the discounted benefits of having access to future loans with the discounted costs of repaying the current loan, of bailing out delinquent members, and of reminding, annoying, or even sanctioning peers with loan defaults. The latter costs arise because the member who tries to compel repayment may suffer a loss of social capital if the potential defaulter reduces the quality and extent of future human, social, and economic relationships with the enforcing member. In other words, there could be a cost in lost friendship.

The argument that the group's homogeneity in social class, kinship, neighborhood, ethnic group, or religion is positively correlated with the group's performance is further supported by the reciprocal or unconditional help among socially cohesive individuals (Robison and Schmid 1988). Among people who care for each other, an individual gains satisfaction (utility) by helping somebody else, even if no claim to future assistance is created. Vice versa, defaulters in socially cohesive groups may incur substantial losses in utility as a result of social sanctions by group members and loss of reputation. Social empathy, or what Bardhan (1993)

also describes as "the ability to imagine oneself in the shoes of others," may explain the unconditional help given to other people.

To summarize, in a world of certainty and perfect competition, there is no role for precautionary savings and consumption credit. By and large, the formal banking sector in developing countries traditionally sees its role as allocating "investment and production loans" and, to a lesser extent, mobilizing savings. It mostly neglects the functions of consumption credit, precautionary savings, insurance, and risk-pooling, which are so important in rural societies, especially for the rural poor facing transitory food insecurity.

But significant constraints to the postulated broader role for rural finance for the poor exist, such as information asymmetries leading to moral hazard and adverse selection, high unit transaction costs, covariate risks, and lack of collateral. Informal institutional arrangements, such as reciprocal gift and loan exchange systems with state-contingent contracts, and interlinked contracts successfully circumvent some of these constraints. Much remains to be learned from these systems, not only for rural financial markets but also for social safety net design (Haddad and Zeller 1996).

An important research issue is to quantify the private and social costs and benefits of informal systems and compare those with the private and social costs and benefits of public investments in rural financial markets. Research could then identify which services could potentially be provided by the formal sector to increase welfare and which services are inefficient for the formal sector to provide. The informal systems are highly localized. They can address idiosyncratic risks but can seldom deal with the covariate risks that can be so detrimental to the food security of the poor. Informal systems also cannot raise large sums of high-risk capital for investment. On the other hand, banking principles based on physical collateral and individualized contracts have failed to integrate the rural poor into formal rural financial markets. Relatively successful formal schemes build on some of the principles of informal finance by exploiting locally available information, by pooling risks, and by utilizing social capital through linkage of third-tier, member-based institutions with the formal financial sector.

Macroeconomic and Financial Sector Policy

Capital Formation and Financial Markets

In capital formation, generally recognized as a necessary condition of development, efficient financial markets are seen to play a key role (McKinnon 1973; Shaw 1973). Of the two principal sources of capital, external and domestic, internal funds are, by far, the most important component. In most low-income countries, internally mobilized funds

main argument is that excessively low interest rates promote investment in low-yielding assets and reliance on supply-led finance rather than promoting self-finance and demand-led mobilization and allocation of funds. The principal hypothesis of the work by McKinnon and Shaw is that interest rates held below an unspecified "equilibrium" level reduce saving and therefore funds for investment (Clarke 1996). The work by McKinnon and Shaw focuses—within a partial equilibrium framework—on the role of liberalized interest rates on savings mobilization and on allocation of funds to higher-earning investments. Montiel, Agenor, and Haque (1993) argue that the underlying incomplete partial-equilibrium analysis ignores the effects of nonprice determinants of supply and demand.

Over the past 10 years, considerable theoretical and empirical research has been carried out to explore further the validity of the theoretical framework by McKinnon and Shaw. Furthermore, in many developing countries, financial liberalization was put into practice, yielding mixed results. Dornbusch and Reynoso (1989) find that financial liberalization in economies with unstable macroeconomic conditions, especially fiscal imbalances and distorted exchange rates, may lead to higher inflation, with its adverse effects on domestic savings and resource allocation. Recent theoretical works (Stiglitz and Weiss 1981; Stiglitz 1989b; Stiglitz 1992) help explain why interest rates in liberalized markets may fall short of market-clearing levels or may rise to risky levels, with adverse consequences for financial institutions, for the government as explicit or implicit deposit insurer, and for the economy at large (Villanueva and Mirakhor 1990). McKinnon (1986, 1988) reviews financial liberalization policies in Latin American countries. Because of imperfect information and moral hazard, ceilings on standard loan (and deposit) rates of interest were found to be justified to elude these constraints. Another survey of experience with financial liberalization concludes that policies "should take into account the initial state of the economy, in particular the financial position of the private sector and the quality of prudential regulations over the financial system" (Villanueva and Mirakhor 1990, 529).

Furthermore, while there does seem to be some evidence that countries with higher real interest rates have higher growth and investment, as shown by Fry (1988) and McKinnon (1989), Clarke (1996) argues that the causality between the level of interest rates and growth has not been clearly established. At the core of the argument for financial liberalization lies the hypothesis that savings are responsive to high interest rates. Intertemporal theory does not provide an unambiguous basis for this hypothesis. As will be shown in Chapter 3, there is little empirical evidence for postulating a highly elastic marginal savings rate.

Gibson and Tsakalotos (1994) give a synopsis of the most frequent criticisms of financial liberalization. Based on their review of the literature, Clarke (1996) expands these arguments by investigating the dual

role that interest rates play in balancing savings and investments as well as financial portfolios of the private sector. Because of the dual role of interest rates, financial liberalization leads to highly unstable interest rates. This macroeconomic instability is compounded by the uncertainty about and volatility of expected returns to investment, as well as the potential of capital inflows to distort the real exchange rate (Clarke 1996). He concludes that financial repression does matter, and he argues that there is a strong case for maintaining slightly positive real deposit rates and sufficient regulation of the banking system to ensure portfolio diversity and lending rates consistent with these deposit rates and a normal profit for the banking system.

Financial repression—characterized by directed allocation of funds and negative real interest rates—undermines the viability of financial institutions. Negative real savings rates encourage a shift from financial to real assets and therefore thin out the financial system (Alter 1990; Heidhues and Weinschenck 1990; Ikhida 1993). On the other hand, financial liberalization—especially if done with shock therapy rather than through sequencing of reforms—will have adverse effects on macroeconomic stability and therefore on savings, investment, and growth. Positive real, but stable, savings and loan interest rates can achieve more for the formation of financial markets than high, but volatile, interest rates. The successful “liberalization” experiences of Taiwan and the Republic of Korea show that stable and regulated financial systems have allowed rapid financial deepening. This was achieved through the state’s regulation and supervision of the banking sector and through the fixing of interest rates at low positive real levels.

Additional Factors Determining Financial Market Development

Apart from the role that macroeconomic policy can play in deepening financial markets, other factors and financial-sector policy instruments have to be considered. Fry (1988) lists a number of institutional and economic policy factors:

- Management of public funds. If public revenues are kept in specialized government institutions, they contribute little to financial development. Parastatal marketing boards or social security organizations are often required to hold their funds in specialized banks that have limited integration into the financial systems.
- Agricultural price policy. Direct or indirect taxation of agricultural producers withdraws funds from the private sector. It lowers disposable income and thus the savings potential of agricultural producers. This, by itself, reduces financial intermediation. If, in addition, these funds are channeled through parastatal institutions with fund-holding requirements, as just mentioned, they

repayment rates. However, in the views expressed here, the focus is exclusively on the potential financial sustainability of the rural financial institution as a criterion for public support, not on the costs and benefits of a public investment in rural finance and thus on the economic sustainability of the rural financial policy. If one takes the view of a private banker who must decide whether to invest in a rural financial institution, of course the criterion of long-term financial sustainability or profitability will hold. If one takes the view of a policymaker, public investments and subsidies for rural financial institutions will be economically justified and sustainable if the social costs (including opportunity costs) of the government support are lower than the social benefits of such intervention.

It is therefore argued here that public support for rural financial institutions should be judged on the expected cost-benefit ratio of public investment, compared with the cost-benefit ratios of uses of public funds under alternative policies. Based on the criterion of economic sustainability of policies, a public investment with high social returns—primary education, for example—may well justify continued support for institution building and expansion over long periods. The policymakers' choice is to allocate public funds among competing investments to maximize social returns. In many rural settings of developing countries, it could be that long-term support for building and maintenance of rural financial institutions that serve the poor has higher benefit-cost ratios in the short and long run than some other competing policy instruments. Since institutional innovation and institution building are long-term efforts, as the examples of the Raiffeissen cooperatives and the Grameen Bank show, public support should also be of a long-term nature. There is definitely no justification for credit projects of a short duration, which eventually become income transfer programs with detrimental effects on rural financial markets and with poor cost-benefit ratios.

However, the postulated concept of cost-benefit evaluation of public investments in rural financial institutions has, so far, not been applied. This is probably because of the dearth of quantitative assessments regarding the welfare benefits of improved access to financial services for rural households. Because of this lack of information on benefits, pragmatic and cautious rules for public policy decisionmaking are definitely needed and appropriate.

3

The Saving and Borrowing Behavior of the Food-Insecure Poor

Agriculture is the major source of income for the majority of the rural poor in developing countries, whether they are directly or indirectly involved in farming. Because this income is seasonal and highly variable, achieving food security at all times requires that resources be transferred from good seasons or years to bad ones and from one place to another.

Understanding the borrowing, saving, and insurance behavior of the poor is critical for designing financial products and systems that can efficiently address their demand for financial services. The review of theory on intertemporal behavior of the food insecure in the preceding chapter identified several hypotheses relevant to the linkage between intertemporal behavior and food security. In view of the limited insurance markets available to the poor in developing countries, savings, credit, and insurance are interlinked. This chapter discusses the empirical evidence on intertemporal behavior of the rural poor.

The chapter begins by summarizing the empirical evidence on the saving behavior of the poor. Major issues dealt with are (1) forms of saving by the poor, including human capital formation, (2) precautionary savings and linkage to food security, and (3) elasticity of savings with respect to the interest rate. Based on this review of empirical evidence, it concludes that formal savings products should not, by default, emphasize the interest rate as the main product characteristic, but should also stress liquidity, security, and savers' transaction costs. These criteria appear to be more relevant for the food insecure in many socioeconomic contexts of developing countries. The second section reviews the borrowing behavior of the poor as it relates to consumption smoothing for alleviating transitory food insecurity and to

the formation of human and physical capital for income generation to alleviate chronic food insecurity. It emphasizes the demand for consumption credit, which has been largely neglected by formal financial institutions. Furthermore, the patterns of credit rationing of the poor by formal and informal lenders are discussed. The third section investigates the empirical evidence on groups addressing households' demand for financial services. The fourth section reviews the existing empirical evidence on the effects of improved access to credit and saving options on household food security. The chapter concludes with a summary of major implications for policy and future research.

Saving Behavior

Saving provides for the accumulation of capital that, in turn, can generate future income and therefore enable future consumption. Aggregate savings and growth of an economy are crucially linked. The inquiry into saving behavior at micro and macro levels has a long tradition (Gersovitz 1988). The following section focuses on microlevel household behavior, particularly of the food-insecure poor. Household savings are usually the largest component of domestic savings in developing countries, especially in lower-income, predominantly agricultural countries.

How the Poor Save

In financial terms, savings are defined as the net change in equity between periods. This definition includes changes in monetary and nonmonetary assets, such as food, jewelry, and other consumption and production durables, and adjustments for changes in debt. Investment, on the other hand, is any increase in the value of asset holdings, irrespective of whether this investment is financed through equity or loans.

When investigating food security and intertemporal behavior, this standard definition of household savings and investment, focusing on monetary and physical capital, is too narrow. It neglects savings and investments in human capital, such as education and improved nutritional and health status of family members. Expenditures for education and improved nutrition not only may increase available human capital and income in current periods, but also could have a beneficial effect on human capital and income available in future periods. A food-insecure individual or household frequently faces decisions on how much to invest in human capital, compared with physical capital and monetary assets. Whether an expenditure is for current consumption or for savings depends on whether the expenditure contributes to the immediate satisfaction of the consumer's wants (Gersovitz 1988).

In view of the broader role of rural finance for food security postulated in this report, the definition of household savings should be

expanded to include investments in human capital, such as the number of children and the education and nutritional status of family members. This expansion of the concept of savings and investment may also help to rationalize the argument regarding credit use for consumptive purposes, which is still a controversial issue.

The Role of Savings in Human Capital Formation. Various types of savings, as they relate to human capital, can be distinguished. First, savings in human capital can be attained through increases in a person's body mass, or more broadly, by improving the nutritional and health status of household members from one period to the next. Second, an increase in the number of children may constitute household savings, if children are seen as providers of food and social security for the parents' old age. Children are often considered a form of savings for old age (Willis 1980). Third, savings can be in the form of improved educational status, be it formal schooling or vocational training. These three forms of savings in human capital become more relevant for food security the poorer and the more food insecure a household is because the food insecure mostly depend on their labor as a productive asset and source of income. Human capital is a determinant of labor productivity (Kumar 1987). Current household food security affects food security in future periods via the nutritional and educational status of its members.

At low levels of nutrition and health care, increases in current consumption improve future labor productivity: if nothing else, morbidity is reduced. . . . At the margin, consumption of basic needs amounts to investment. One may even go further and argue that consumption and investment at the margin are, over time, synergistic up to a point (Dasgupta 1993, 247-248).

Apart from the effect on labor productivity of improved nutritional and health status, the size of the family labor force affects household food security, because of economies of size and scope in production, consumption, and investment (Schrieder 1995; Zeller et al. 1993). Empirical research from Cameroon and Madagascar further confirms that in liquidity-constrained households, the number of working adults has a significant and positive impact on per capita income and calorie consumption (Zeller et al. 1993). These results indicate that these households substitute family labor for scarce capital. They choose more labor-intensive production processes so that the marginal value product of capital and, therefore, income increase.

Lanjouw and Ravallion (1995) investigate the relationship between poverty and household size. They show that the widely held belief that large families tend to be poorer is questionable because of economies of size. Appelbaum and Katz (1991) provide an economic analysis of

risk diversification and insurance that links them with fertility decisions. Based on their framework, the family reacts to uncertainty by spreading risks across children so that family size depends on considerations similar to those made in determining savings under risk. The analysis by Rosenzweig and Stark (1989) also supports the view that demographic decisions are partially motivated by the desire to reduce exposure to risk. For example, choosing a marriage partner from outside the village may help to spread risk. In another example, children may be given to relatives and friends as foster children presumably in response to chronic food insecurity and the desire to spread risks and strengthen social networks.

Kochar (1995) investigates the roles that male and female family labor play in bridging liquidity deficits and consumption shortfalls in a household sample in India. Her results indicate that households respond to idiosyncratic crop income shocks by significantly increasing their supply of male wage labor by increasing the hours that men work for wages. Female laborers do not increase their hours of work for wages, however, and only slight evidence is found that female members increase the hours they spend on own-farm labor. These results suggest that labor supply is influenced by income shocks and liquidity constraints.

One form of savings in human capital that is often overlooked is the building up of body mass. Nutritional surveys show that food intakes and energy expenditures vary between seasons, resulting in body mass losses or gains in particular seasons (Sahn 1989). Empirical evidence from The Gambia provides a reliable database for this phenomenon. Fox (1953) found that farmers eat most during the immediate postharvest period, when workload and energy expenditure are low. Postharvest feasting is a common feature of traditional peasant societies. Payne (1989) compares the observed Gambian food allocation pattern with alternative strategies such as constant food intake to achieve constant body weight. Considering that much food is lost in storage, the intake pattern of postharvest feasting has clear advantages over the other strategies (Payne 1989). One advantage of gaining weight during the postharvest period is that high body weight is attained before the planting season, at just the time when it is likely to be most crucial for work output, but is then allowed to decline and thus reduce maintenance cost during the rest of the year.

Payne's dynamic presentation of the relationships among consumption, nutrition, and labor productivity suggests that body weight serves as a way to save for the hungry, labor-intensive period, especially in areas with distinct seasonal patterns of food production, food prices, and workload. Dasgupta (1993) cites similar anthropometric evidence of limited access to intertemporal markets from other countries, showing that adults and children experience seasonal changes in weight.

Build-up of body mass after the harvest is not only governed by resources available to the household, but also by those of the community. In many traditional societies, postharvest ceremonies play a significant

role in transferring food among households. For example, in Madagascar, the custom of second burial (*Famadihanana*) is an important family event. The village population and relatives and friends are invited to share food and eat well. Each guest contributes to the costs of the splurge, either in cash or in kind. Spatially diversified, communal, or clan-based food-sharing mechanisms may spread individual consumption risks and reduce their detrimental effects on labor productivity and health.

Investment in education, representing the third form of human capital formation, also yields future returns. Ram and Schultz (1979) investigate capital formation in India; they include opportunity cost of the students' time as well as expenditures on educational institutions as components of capital. They estimate that human capital formation accounts for between a third and just over a half of domestic capital formation as traditionally defined.

An important strategy for attaining food security is savings in the form of human capital (investments in health and nutritional status, the number of household members, and education, especially of children). In poorer households where human capital represents a larger share of total capital available to the household, expenditures for maintaining the human capital base are relatively more important than in wealthier households. In poor households, most of the food and basic nonfood items are consumed to assure survival. Therefore, the propensity of food-insecure households to save physical capital or monetary assets for other than precautionary reasons is low; day-to-day and season-to-season survival strategies dictate the pattern of borrowing, saving, and consumption for these households. Whereas excess consumption in food-secure households can be viewed as forgone investment, this is not so for the food-insecure poor, at least not for consumption of basic foods and nonfood inputs into good nutrition.

Savings in Monetary and Nonmonetary Assets. As described in the conceptual framework in Chapter 2, decisions to hold assets from one period to another depend on the risk-bearing ability and risk exposure of households and the imperfections of labor, commodity, and intertemporal markets. The following discussion focuses on the portfolio of physical and monetary assets.

Households evaluate different forms of savings in terms of security, liquidity, and economic return. Liquidity and risk-adjusted returns of the assets possessed by the household are expected to be major determinants of its ability to smooth consumption intertemporally, especially if access to financial institutions is missing.

Assets exhibit different degrees of liquidity, depending on the physical characteristics of the asset (divisibility versus lumpiness) and on the conditions and imperfections of the asset markets. Some assets are seldom bought or sold because of cultural or legal constraints that forbid their sale. Other durables may lie in the domain of an individual's

property (women's jewelry and men's cattle, for example). These can only be liquidated if the individual agrees to sell to finance other activities. A third class of durables are illiquid because of their physical characteristics, such as a standing crop for which there are no futures markets. The degree of liquidity of durables is also determined by the divergence of expected returns of holding the asset and its sale price in imperfect commodity markets (Robison and Barry 1987).

Consumption durables such as cooking utensils are examples of rather illiquid assets. The most liquid asset is money. Holding a cash reserve maintains flexibility in future use, but also incurs the risk of inflation and of demands from other household or community members. For these reasons, it may be preferable to hold savings in the form of food, livestock, and jewelry, or to deposit cash in a safekeeping institution, such as a savings group or with a money keeper. A general systematization of forms of household savings according to their degree of liquidity or their security or rate of return is, of course, not feasible. Physical characteristics of assets such as divisibility and lumpiness may be overridden by specific cultural or regional- or country-specific market conditions. For example, while livestock may be a worthwhile investment in some environments, it may not be a profitable and liquid form of savings under different socioeconomic conditions. Czukas, Fafchamps, and Udry (1995) explore the role of livestock as a form of liquid savings in Burkina Faso. Their results show that livestock transactions play less of a consumption-smoothing role than is often assumed. Livestock sales were found to offset about 15 to 30 percent of the income loss resulting from low rainfall because households attempt to hold on to their livestock after the hunger period in anticipation of rising prices. This phenomenon suggests covariate risks in poorly integrated markets, which then drastically affect the prices for commonly held assets, such as land, grain, or livestock. Rosenzweig and Wolpin (1993) investigate the dual role that the holding of bullocks can play in rural Indian households (for consumption smoothing and income generation) and find evidence that bullock sales are motivated by the need to smooth consumption. Several authors report that lower income groups do save and often have a substantial savings potential (Seibel 1985; Heidhues and Weinschenck 1986; Jung 1987).

Much still needs to be understood about the saving behavior of the poor. However, deficiencies in the data are most acute for analyzing saving behavior (Gersovitz 1988; Deaton 1991a). This is because savings have to be computed either as a residual of income minus expenditures or as a change of assets and liabilities during the survey recall period. All these components, especially income and liabilities, are highly subject to measurement error.

More panel survey data and long-term recall data regarding the mode of acquisition of major assets are urgently needed. It is hypothesized that capital formation in rural households is a result of continuous

and discrete changes. The process of asset formation is influenced by access to intertemporal markets, in particular insurance and credit markets. Furthermore, exposure to idiosyncratic and covariate risks plays a role, as well as life-cycle determinants of savings. Build-up of assets is feasible whenever equity-financed incremental investments can be made by the household. For example, farmers may gradually plant trees and terrace their land over a period of years, financed by seasonal savings. Lump-sum, indivisible investments, on the other hand, require a large sum of capital at one point in time. For poor households, the purchase of a plow, ox cart, or sewing machine usually requires access to credit because equity capital is insufficient. Access to insurance markets and the liquidity of the invested asset are likely to play particularly large roles in the investment decisions of the poor who have little capacity to bear risks.

Precautionary Savings and Food Security

In the previous chapter, the importance of precautionary savings, especially among the risk averse and poor, was postulated. Here the empirical evidence is reviewed, encompassing a discussion of savings motives, empirical evidence on a large variety of assets held for precautionary savings, and econometric evidence of the role of precautionary savings in consumption smoothing.

Too little is known about the determinants of household savings, particularly in developing countries (Gersovitz 1988). According to the empirical evidence on savings motives and on patterns of credit use, short-term consumption smoothing ranks high among the determinants of household saving and borrowing, and the life cycle (saving for old age) and investment motives (saving for profitability) are less relevant for those who are struggling in the short run. In Cameroon, for example, Jung (1987) found that health provision, education, and home improvement were the major motives for household saving (Table 2). Large cash holdings, amounting to about one season's revenues, are reported by Schrieder (1995), again for Cameroon. These empirical results highlight the demand for precautionary savings.

From the discussion in Chapter 2, it follows that the poor or more risk-averse households will hold more precautionary savings than the wealthy. This hypothesis is also borne out by the short-term borrowing and saving behavior of rural households in Madagascar (Zeller 1993). In this study, the household survey enumerated all physical and monetary assets possessed by the household, and these assets were valued at current prices. Total wealth per adult-equivalent ranges from US\$109 in the low wealth tercile to US\$1,384 in the high wealth tercile (Table 3).

The most important assets are riceland and upland. The low tercile holds about 30 percent of its wealth in land, whereas the share of land in total wealth of the high tercile is almost 60 percent. Since the asset and liability figures were observed in the month of May, which is the peak month of harvest in the regions studied, the share of food stocks is

Table 2—Savings motives, Cameroon

Motive	Responses	
	Number ^a	Percent
Health provision	87	47.0
Education	40	21.6
House construction	23	12.4
Family obligations	19	10.3
Agricultural production	16	8.7
Total	185	100.0

Source: Jung 1987.

^a Based on interviews of 160 farm households in Cameroon.

relatively high, especially in the low tercile. The house and consumption durables in poorer households account for a larger share of total wealth than in richer households. As income and wealth decline, relatively more total wealth is invested in liquid assets for precautionary savings.

Poorer households have a larger share of liabilities (see the bottom of Table 3). Changes in debt and assets result in changes in equity capital as reported for two periods in Table 4. The first period includes the months from the peak of the hungry season to the harvest, that is, between February and May 1992. The second period covers the months of June to September 1992. In September, the poorest households

Table 3—Asset portfolio and liabilities of rural households, differentiated by wealth, Madagascar, 1992

Asset	Wealth per adult-equivalent		
	Low	Medium	High
	(US\$)		
Total value of assets per adult-equivalent	109	353	1,384
Share of value of specific assets in total assets value	(percent)		
Riceland	13.0	23.1	33.7
Upland	25.3	34.1	26.7
Animals	7.5	10.1	8.6
House and other buildings	25.2	16.0	18.4
Consumption durables	9.8	5.3	5.0
Production durables	4.0	5.2	2.3
Monetary savings	1.3	0.4	1.0
Food stocks	13.6	5.5	3.9
Loans lent	0.3	0.5	0.4
Total	100.0	100.0	100.0
Finance of assets			
Share of equity	92.3	97.9	98.4
Share of liabilities	7.7	2.1	1.6

Source: Zeller 1993.

Notes: The results are based on data from 182 households. Numbers may not add to 100 because of rounding.

Table 4—Household total savings, differentiated by wealth, Madagascar, 1992

Change	Wealth per adult-equivalent		
	Lowest	Medium	Highest
Changes from round 1 to round 2			
Value of assets ^a	66.6	104.2	125.8
Value of liabilities	8.3	32.4	29.7
Value of savings	58.3	71.8	96.1
Savings rate in period ^b	14.9	3.9	1.8
Changes from round 2 to round 3			
Value of assets	-30.5	-32.9	-10.6
Value of liabilities	0.7	3.2	26.0
Value of savings	-31.2	-36.1	-36.6
Savings rate in period ^b	-6.9	-1.9	-0.7

Source: Zeller 1993.

^aAll values are reported in US\$ (1,850 francs Malgache equals US\$1). The amounts listed are the means of wealth of the households in the respective tercile.

^bTotal savings in the asset tercile reporting, computed as total savings of all households in the respective tercile or aggregate divided by the equity of the corresponding tercile or aggregate at the beginning of the reporting period (in percent).

typically begin to experience transitory food insecurity. Savings during the first period, which ends at the harvest, range from US\$58 per household in the low tercile to US\$96 in the top tercile. This implies a relatively high rate of periodic savings of 14.9 percent for the low tercile of households as an aggregate. The large savings rate, however, is soon reversed. Four months after the rice harvest, the households, on average, had already disinvested some of their assets, such as food stocks. Debt was basically unchanged in the low and medium asset terciles, while it increased by US\$26 in the high tercile (mostly for purchases of agricultural inputs for the coming growing season). This induces savings rates to become negative in the second reporting period, ranging from -6.9 percent in the poorest tercile to -0.7 percent in the richest tercile. This result is indicative of the high fluctuations in assets and liabilities among poor households, and the strong demand by the poor for consumption credit and precautionary savings.

Assets must be liquid to be suitable for precautionary savings to avoid transitory food insecurity. Ideally, their value should move along with the prices for staple food and basic nonfood items. Depending on the socioeconomic and agroecological context, and on the gender, wealth, and education of an individual, precautionary savings can take many forms, either monetary or nonmonetary.

Cash holdings, the most liquid asset, are generally low. This may be a consequence of the high risk of loss in purchasing power due to inflation, or it may be the result of missing or unattractive formal savings services. In many surveys, cash holdings may actually be underreported.

In The Gambia, very little household income is saved in cash, at home, with rotating savings and credit associations, or with local money keepers (Shipton 1990).

To reduce the risk of theft, or to be able to deny claims from family members, friends, and relatives, savers often employ money keepers or group-based savings mechanisms. Generally, the deposits earn no interest and can be withdrawn at short notice. The money keepers maintain enough liquidity to service the claims of their depositors, but they may use the funds to finance their own business transactions, or for lending. In developing countries, households often save in-kind assets, such as jewelry, stored crops, consumer durables, construction materials, and livestock. In Kenya, women save fabrics known as *leso* cloths and garments made of *leso*, which can be easily sold throughout the year to bridge liquidity deficits (Oganda 1989). In Cameroon and Zambia, nonmonetary savings may be crops, such as stored maize or cassava as a standing crop, poultry and livestock, and construction materials. Some of these savings serve primarily precautionary or insurance motives (Heidhues and Weinschenk 1990; Mrak 1989). These traditional forms of savings are exposed to a variety of risks, such as theft and pests.

Recently research has begun to investigate the role that precautionary savings play in consumption smoothing and the asset portfolios of households. Engen and Gale (1991) use a precautionary savings model to explain why households in the United States hold high-yielding but illiquid, long-term monetary assets as well as other, lower-yielding but more liquid forms of savings. The latter savings are used as a buffer against short-term income fluctuations. McCarthy (1992) splits a U.S. household sample into low- and high-wealth groups to test for precautionary savings if insurance is imperfect. His econometric model suggests that the marginal propensity to consume food out of idiosyncratic shocks to income is higher among low-wealth consumers than among the wealthy. In other words, the poor decrease or increase their food expenditures more readily with changes in income. His data further indicate that consumers prefer liquid assets for holding precautionary savings. Carroll (1994) points out that consumers who have low incomes and assets early in the life cycle face greater consumption uncertainty in the future than those born rich and well-insured. The former group will, under the precautionary savings model, postpone consumption.

Broca (1995) shows in his econometric analysis that rural households in Pakistan hold precautionary savings. Broca rejects the hypothesis that precautionary savings are significantly higher in credit-rationed households than in households that can obtain as much credit as they demand. Deaton (1991a) develops a simulation model that highlights the potential that precautionary savings have for smoothing consumption when income shocks occur. This research reinforces the call for formal savings products that are highly liquid and have low transaction costs.

The Elasticity of Savings with Respect to the Interest Rate

Much of the policy discussion in rural finance is focused on the level of interest rates and the role they play in stimulating savings. The basic intertemporal model, as outlined in Chapter 1, yields an ambiguous relationship between savings and interest rates (Gersovitz 1988; Deaton 1992). In the following section, empirical evidence on this issue is reviewed.

A recent and comprehensive review of empirical findings by Desai and Mellor (1993) concludes that the response of savings to interest rates is inelastic, and that nonprice factors, such as household size and the dependency ratio, as well as income and consumption shocks, are more influential in determining the savings rate. This is contrary to findings by advocates of financial liberalization who emphasize the positive role that high and liberalized interest rates can play for savings mobilization, growth, and development (McKinnon 1973; Shaw 1973; Fry 1988). Deaton (1992) critically questions the validity of past econometric savings models, especially those for aggregate national savings, because of inherent measurement errors of savings and problems of aggregation. More recent studies by Giovannini (1983), Khatkhate (1988), Gonzales Arrieta (1988), and Warman and Thirlwall (1994) do not find a statistically significant relationship between savings and interest rates.

Clearly, more empirical research is required to estimate micro- and macro-level propensity to save with respect to interest rates. Future research must focus much more on controlling for nonprice factors, in particular, household or population demographics and income and consumption shocks. In view of the high uncertainty of future consumption, it appears that the precautionary savings motive, which leads to the demand for liquid and therefore generally lower-yielding assets, will tend to result in a smaller elasticity of savings with respect to interest rates in poorer households compared with wealthier food-secure households.

Access to and Use of Credit

In the not so distant past, rural finance policy was synonymous with rural credit policy. Smallholders, tenants, and wage laborers were considered too poor to save. The focus on credit needs instead of credit demand was emphasized through a supply-led policy of subsidized, supervised, and narrowly defined production credit. This credit often was designated mostly for seed and fertilizer for particular cash and export crops largely grown by wealthier farmers. Collateral requirements, paperwork, long waiting periods, corruption, and rent-seeking all helped to discourage creditworthy but poor borrowers from seeking formal credit. These and other reasons for the failure of subsidized credit policies are well documented and need not be elaborated further

although their importance is fully recognized (Adams, Graham, and von Pischke 1984).

Instead, this section focuses on borrowing behavior and its relation to food security. It emphasizes the role of the informal sector in general and of consumption credit in particular. The recent empirical evidence on credit rationing is also reviewed, keeping in mind that not all rural households demand credit and that not all borrowers are rationed.

Use of Informal and Formal Loans

Given that the majority of the poor in developing countries lack access to formal credit, any carefully undertaken household sample survey is likely to conclude that informal credit is the major source of loans for the poor. It is less recognized that most of the informal loans are demanded and subsequently used for consumption purposes.

Table 5 states the purposes for which a loan was sought by rural households in western Nigeria (Oyatoye 1983). Education and consumption accounted for roughly 60 percent of loan uses, whereas production credit (for farming and trading businesses) was 40 percent. These loans came from a government credit scheme. Formal lenders usually discourage borrowers from using loans for consumption to maintain family labor. Some formal institutions may lend for financing hired labor, but very few will finance family labor. Because formal lenders discriminate against consumption credit, but also because of differences in loan sizes and maturities, the use of loans obtained by the same household is usually dependent on the source and related loan characteristics.

In Madagascar, about 62 percent of debt from informal lenders was used for consumption, while only about 7 percent of debt from formal loans was used for this purpose (Zeller 1993). In this study, consumption was defined as expenditure for food, shelter, clothing and other nonfood items, consumer durables, housing, education, and health. The figures for a similar rural household sample in Cameroon

Table 5—Purposes for which a loan was sought, western Nigeria, 1983

Purpose	Number of farmers	Percentage of total
Children's education	52	38.8
Farming	40	29.9
Retail trade	14	10.5
Helping relatives	9	6.7
Family maintenance	8	6.0
Festivals	5	3.8
Other	6	4.3
Total	134	100.0

Source: Cited in Oyatoye 1983, 279-291.

were 79 percent and 40 percent for the informal and formal sector, respectively (Schrieder 1995). The same pattern was observed in a sample of 350 households in rural Bangladesh: on average, about 35 percent of informal debt was disbursed for food, health, social events, education, and consumption durables, while the value for the formal sector was about 16 percent (Zeller, Sharma, and Ahmed 1996).

A recent survey of 1,920 households in rural China points to different loan usage patterns of poor and nonpoor households (Zhu, Jiang Zhong, and von Braun 1996). Among the poor in this sample, 31 percent took a loan. Of those, 52 percent reported that they used the loan for consumptive purposes. Among the nonpoor in the sample, only 27 percent took a loan. Of those, 47 percent used it to finance consumption. Access by the poor to private sources and bank loans had a significant effect on food consumption per capita.

In The Gambia, household demand for credit is high, especially before and during the main cropping season. That is the time when food stores and money reserves are depleted, and agricultural inputs, hired labor, and household expenditures need to be financed. Table 6 shows the access to credit of rural households in both the informal and formal markets, differentiated by income groups, and the distribution of loan uses within different households (von Braun et al. 1990). First, richer households obtain a larger share of the total credit available than poorer income groups do. Second, credit use for consumption

Table 6—Access to and use of credit, differentiated by income group, The Gambia, 1987

Access to credit/use of loans	Income group				
	Low	Lower middle	Upper middle	High	All
	(percent)				
Access to credit by income group					
All uses	14	18	25	42	100
Agricultural inputs (in kind)	11	19	28	42	100
Food	21	32	25	23	100
Other items (clothes and so forth)	27	14	11	48	100
Cash	12	17	27	44	100
Use of loans received by income group					
Agricultural inputs (in kind)	37	47	52	46	46
Food	10	12	7	4	7
Other items (clothes and so forth)	23	9	5	14	12
Cash	30	32	37	37	35

Source: von Braun et al. 1990.

Note: Numbers may not add to 100 because of rounding.

plays a more important role in poorer households than in more affluent households. Even though the harvest in 1987 was above average, a large share of the credit was used for food and other consumption by those in the lower half of the income groups. In years following meager crops, consumption loans are likely to be considerably higher.

Agricultural inputs, which were mainly advanced in kind by The Gambian Cooperative Union, accounted for 46 percent of annual loans, cash not further specified as to use was 35 percent, food was 7 percent, and other consumer goods, 12 percent. The share of food loans was relatively low in the 1987/88 year because the preceding crop had filled the stores. Seventy-three percent of the loans were received before or during the cropping season, and one-half of the loans reported were less than 62 dalasis (US\$10 in 1987/88). In 1987/88, the informal credit sector provided about 80 percent of all credit. Relatives, friends, local shopkeepers, and informal self-help groups were the major credit sources of rural Gambians. Specialized moneylenders played only a minor role. Friends and relatives outside the extended family were the most important credit source (41 percent). Shopkeepers provided 35 percent of the credit, either in cash or as consumer items; household members contributed up to 16 percent of total credit advanced.

Broadening the perspective on linkages between rural financial markets and the intensity of modern input use requires an investigation of the demand for financial services of rural households and their farm enterprises. In comparing access to and use of informal and formal loans in Pakistan and Madagascar, von Braun, Malik, and Zeller (1993) present data on credit use, differentiated by asset quintile and by use of credit (Tables 7 and 8). The tables differentiate observations by wealth of household in order to assess differences between poor and wealthy households. Wealth is measured by the value of all assets possessed by the household, including land, livestock, house, and other production and consumption durables.

Input costs include costs for fertilizer, pesticides, water fees, mineral and organic fertilizer, hiring of bullocks, and postharvest handling. Nonfood expenditures include consumption goods, except consumption durables, and costs for social ceremonies, education, and medical services. Food expenditures include consumption of home production and acquired food.

Several similarities can be seen between the two countries. The shares of credit finance for inputs, food, and nonfood expenditures are higher for poorer households than for richer households. The high share of inputs obtained through credit in the poorest group (48 percent in Pakistan and 35 percent in Madagascar versus 18 and 17 percent, respectively, in the richest group) indicates that attention should be paid to financing inputs in support of increased use of technology by the poor. Poorer households in both countries are often sharecroppers; they receive seeds, fertilizer, and pesticides on credit from their landlords.

Table 7—Proportion of expenditures met through credit, by asset quintiles and use of credit, Pakistan, 1990

Asset group quintile	Proportion of expenditure types met through credit				Credit-using households as a share of total households
	Input	Capital	Consumed, including food	Total	
	(percent)				
Lowest	47.7 (39.9)	37.3 (4.5)	31.9 (55.0)	32.9 (100.0)	58.7
Second	30.9 (22.8)	65.2 (26.7)	30.1 (50.6)	27.9 (100.0)	54.2
Third	17.2 (13.9)	44.9 (27.5)	24.4 (54.0)	21.1 (100.0)	58.3
Fourth	12.6 (18.4)	10.6 (13.3)	21.2 (68.3)	12.7 (100.0)	58.8
Highest	17.6 (37.4)	14.3 (23.4)	14.9 (39.2)	10.7 (100.0)	55.5
All households	22.2 (27.7)	23.3 (19.8)	22.7 (51.6)	17.0 (100.0)	57.1

Sources: IFPRI, Pakistan panel survey Round 13, 1990. Cited in von Braun, Malik, and Zeller 1993.

Note: Figures in parentheses are percentage shares of credit used for each category out of total credit.

Table 8—Proportion of expenditures met through credit, by asset quintiles and use of credit, Madagascar, 1992

Asset group quintile	Proportion of expenditure types met through credit					Proportion of households borrowing one time from	
	Input	Capital	Non-food	Food	Total expenditures	Formal sector	Informal sector
	(percent)						
Lowest	35.2 (20.7)	5.4 (8.0)	3.9 (10.6)	6.7 (60.7)	7.2 (100.0)	51.4	95.6
Second	40.7 (32.4)	0.8 (4.6)	4.7 (27.5)	2.0 (35.5)	3.3 (100.0)	52.6	97.4
Third	23.1 (13.6)	4.7 (18.8)	3.5 (13.9)	4.1 (53.8)	4.6 (100.0)	52.8	100.0
Fourth	45.9 (35.4)	7.6 (22.5)	1.2 (4.4)	3.4 (37.7)	5.4 (100.0)	81.6	97.4
Highest	16.5 (45.8)	2.2 (24.4)	1.3 (11.2)	1.1 (18.6)	2.5 (100.0)	89.5	92.1
All households	26.7 (30.3)	3.5 (17.0)	2.4 (11.5)	3.1 (41.2)	4.2 (100.0)	65.6	96.3

Sources: IFPRI/CNRE/DSA Survey, 1992. Cited in von Braun, Malik, and Zeller 1993.

Note: Figures in parentheses are percentage shares of credit used for each category out of total credit.

The bulk of the credit, especially in poorer households, however, is used for consumption and human capital formation, as the percentages in parentheses reveal. In the aggregates for both countries, more than 50 percent of the credit is used for financing food and nonfood consumption expenditures, including medical expenses, social ceremonies, and education-related expenses. Not surprisingly, as households get wealthier, the share of expenditures financed by credit decreases, although the absolute amount of credit obtained rises. Capital is more scarce in poorer households than in wealthier ones, which implies that poor households will be more willing to pay high interest rates.

Tables 7 and 8 also highlight some important differences between the rural financial markets in the two countries. First, the share of credit in financing total expenditures is much higher in Pakistan than in Madagascar. The availability of subsidized formal credit and the enormous external funds pumped into the system, combined with a more active (Asian-type) informal credit market, result in higher credit use in rural households. Second, the use of credit to finance durables, which include land, livestock, housing, and other consumption and production durables, is lower in Madagascar than in Pakistan. This is explained by the lack of formal medium- and long-term credit. The informal sector in both countries, as elsewhere, does not provide significant amounts of credit for a longer duration. The demand for medium- and long-term credit is more successfully met in Pakistan, where loans are available for up to five years. Longer-term loans from informal financial institutions generally bear higher interest rates than short-term loans (Schrieder 1995; Shipton 1990; Zeller 1993).

The skewed access to formal credit is also apparent in Table 9, which differentiates the percentage of the loan in the total credit amount obtained by source and by asset quintile. It is apparent that poorer households in both countries obtain less of their credit from formal sources and more from friends and relatives. Loans from relatives and friends are often free of interest. Charging interest rates in Pakistan is not socially acceptable, as it is in Madagascar. In Madagascar, a considerable number of loans exist with high positive rates of interests.

The importance of loans from other informal sources is significantly greater in Pakistan than in Madagascar. This divergence illustrates a typical difference in the structure of informal credit markets between Sub-Saharan African and Asian countries. In African countries, credit transactions are generally not linked with land or input transactions as they are in Asian countries; here, most lending occurs within social networks based on reciprocity. A comparison of the relative importance of the formal market between the two countries shows some striking differences. In Pakistan, where lending to individuals based on land collateral is dominant, the poorest quintile derives only 1 percent of its credit from formal lenders, whereas the highest quintile obtains 58 percent. In Madagascar, where most of the credit programs

Table 9—Percentage distribution of amount and number of loans from formal and informal sources of credit by asset quintiles and major sources of credit, Pakistan, 1990, and Madagascar, 1992

Asset group quintiles	Formal			Informal		
	Percent credit from formal sources	Number of loans	Percent credit from friends and relatives	Number of loans	Percent credit from other informal sources	Number of loans
Pakistan						
Lowest	1.1	3	31.4	201	67.5	585
Second	4.8	13	49.5	249	45.6	396
Third	12.6	23	48.3	244	39.1	308
Fourth	29.6	52	35.4	174	35.0	285
Highest	58.4	116	20.1	139	21.5	263
All households	32.2	207	32.4	1,007	35.5	1,837
Madagascar						
Lowest	39.6	28	55.8	282	2.3	35
Second	23.7	21	51.4	255	12.4	41
Third	38.1	40	48.9	255	6.5	46
Fourth	55.2	52	31.1	203	6.8	39
Highest	60.2	104	23.9	149	8.0	36
All households	49.4	245	35.9	1,144	14.7	197

Sources: IFPRI, Pakistan panel survey Round 13, 1990; IFPRI/CNRE/DSA Survey, 1992. Cited in von Braun, Malik, and Zeller 1993.

in the survey areas are based on peer monitoring as a substitute for collateral, the poorest quintile obtains 40 percent of its credit from formal sources. Thus, the group-based approach appears to be far more successful in reaching the poor than the traditional approach based on land as collateral. The high repayment rates of most of the group-based credit programs in Madagascar also demonstrate that the locally based screening of loan applicants and the enforcement of loan repayment is more effective than the collateral approach (Zeller 1996).

Considering that the bulk of the formal credit in Pakistan is transferred to the wealthy, the subsidized interest rates demonstrate the transfer of public resources to landholding households. The policy of subsidized credit, coupled with land collateral, certainly has serious efficiency and equity implications. In Madagascar, all credit programs charge positive real interest rates. Compared with high weighted interest rates in the informal sector of Madagascar of up to 86 percent of the annual loan amount for loans from socially distant lenders, formal interest rates ranging between 12 and 24 percent are very attractive, especially for poorer households, who pay higher interest rates than wealthier households.

In Pakistan, where the direct charge of interest rates is socially unacceptable, the percentage of informal loans with positive interest rates is very low (0.7 percent). Most respondents are reluctant to reveal whether they are charging or paying interest. Implicit interest charges through interlinked contracts, however, are presumably widespread, but were not quantified in this study (von Braun, Malik, and Zeller 1993).

In many developing countries, informal groups play a significant role in savings accumulation, insurance, and informal credit. Financial self-help groups frequently assign different funds for different purposes. These are the primary, emergency, and mutual aid funds. The primary fund corresponds to the members' contractual savings. The emergency and mutual aid funds consist of irregular but obligatory member contributions. Many groups fine participants who disobey group rules. The primary group fund generally serves as a credit portfolio for member loans. These loans are not restricted to income-generating investments. As Table 10 indicates, human and operational capital loans dominate. Education expenditures, in particular, are frequently financed through informal financial-sector loans. This position steadily increased between 1971 and 1988.

The emergency fund covers unexpected and urgent loan demands of members. It is also used to cover contributions of defaulters and to assist members who are temporarily unable to meet their savings obligations (Miracle, Miracle, and Cohen 1980). Emergency loans are predominantly called upon to cover medical, funeral, and other social expenses. The mutual aid fund provides help for the same circumstances as the emergency fund. The member is expected to repay the emergency loans, however, but not the mutual aid funds. Whereas the

Table 10—Uses of loans from self-help groups, Cameroon, various years

Use	1968-70 ^a	1971 ^b	1988 ^c
	(percent)		
Family expenditure	12.7	26.6	...
Education	18.2	16.0	23.2
Health and medical expenses	...	8.5	18.4
Dowries, obligations to in-laws	3.6	9.5	...
Trade	...	7.4	7.4
Housing improvements, construction	10.9	2.0	...
Savings deposited with other financial self-help groups	...	8.5	...
Paying debts	...	7.5	...
Open a business or a farm	3.6
To buy things, for example, farm inputs	23.6	...	30.1
To meet normal expenses, for example, food	14.5	...	11.8
Acreage expansion	1.8
To pay farm labor	7.3
Other	12.7	14.0	...
Total	99.8	100.0	100.0

Sources: Adapted from Bouman and Hartefeld 1976; Miracle, Miracle, and Cohen 1980, 701-724; and Schrieder 1989.

Note: The leaders (...) indicate that no information was available.

^aSurvey of 56 members, West Cameroon, 1968-70.

^bSurvey of 54 members interviewed in Babanki, Cameroon, in 1971.

^cSurvey of 136 members, West, Northwest, and Central Cameroon in 1988.

emergency fund is mainly an insurance substitute, the mutual aid fund is a genuine form of member-financed insurance. Most often, a financial self-help group (SHG) offers either an emergency or a mutual aid fund (Schrieder and Cuevas 1992; Zeller 1993). More research should be devoted to understanding these informal savings, credit, and insurance systems in order to provide policy information for the design of rural financial institutions and public social safety nets.

In summary, the informal finance sector plays an important role in providing credit and insurance services for consumption smoothing. Many of these systems are based on reciprocity. Adams (1992, 21) emphasizes the role of the informal sector and the potential of learning from it in order to improve the design of institutional arrangements in the formal sector:

Studying these markets will help to clarify the financial services that informal finance is providing more efficiently than formal financial intermediaries and may also uncover practices that could be adopted by banks and cooperatives.

More research is required to better understand the institutional arrangements of informal finance and its costs and benefits. While this review emphasizes a broader role for rural finance in food security, this

does not imply a crowding out of informal financial services by formal consumption credit programs. It may well be that the formal sector is destined to remain a higher-cost supplier of consumption credit and insurance services, even if program designs and institutional arrangements are further improved by learning from, building on, and linking with institutional arrangements in the financial market.

Evidence on Credit Rationing

Based on the pioneering work of Stiglitz and others, recent research has made major advances in understanding and documenting the occurrence of credit rationing in developed and developing countries.

There are currently two methodologies in use for testing for the presence of credit constraints. The first infers the presence of credit constraints from violations of the assumptions of the life-cycle or permanent income hypothesis, while the second collects information directly through household surveys on whether households perceive themselves to be constrained (Zeller et al. 1996).

In essence, what empirical models based on permanent income/life-cycle hypotheses do is to examine whether current household consumption follows (tracks) current household income. The null hypothesis is that given regular (convex) preferences, consumption will not track income in the absence of liquidity and borrowing constraints. Hence, counterexamples—cases that exhibit significant tracking—are taken as evidence of liquidity and borrowing constraints. According to Hall's (1978) pioneering work in this area, which assumes a quadratic utility function and a constant rate of interest, consumption (C) follows a simple rule: with no borrowing constraint, given C_t , no other variable known at time t —including income—should help predict consumption at time $t + 1$, C_{t+1} (Blanchard and Fischer 1989).

By its very nature, empirical testing of these types of models requires repeated observation of the same unit. Hence, most methods based on life-cycle theories are unusable when lengthy panel data are not available.

Since prudent behavior, too, can result in consumption that tracks income, there is a need to distinguish empirically between prudent behavior and behavior produced by borrowing constraints. This is done by Zeldes (1989). Morduch (1990) extends this framework to model Indian farm households that may modify production plans in the light of expected borrowing constraints. Both studies, like Hall's, rely on the violation of the first order conditions of utility maximization as a test for borrowing constraints. Though they represent major innovations, certain limitations nevertheless exist. First, if uncertainty is negatively correlated with wealth, then current income will be negatively correlated with consumption growth, even in the absence of borrowing constraints (Carroll 1991). Second, as Deaton (1991b)

points out, the effect of negative income shocks on consumption also depends on the initial asset position of households.

Paxson (1992) offers an interesting approach if panel data are not available but repeated cross-sections are. First, assuming a specific income process and a constant absolute risk aversion (CARA), she derives a closed-form solution for an intertemporal consumption function that has current consumption as a function of current wealth, "permanent income," and a third term reflecting prudent behavior. In the absence of a long panel, Paxson uses historical rainfall data to decompose current income into its "transitory" and "permanent" parts. She then examines the propensity to consume out of transitory income and permanent income for rural households in Thailand. Therefore, testing for borrowing constraints within this framework may be based on an examination of the coefficient of transitory income in the consumption function. If borrowing constraints are not binding, one could expect this to be close to zero.

A major problem of these indirect approaches of testing for liquidity constraints is that they are not able to identify individual households as being constrained, but only groups such as landless laborers. Furthermore, they do not permit the quantification of credit constraints; that is, it is impossible to say how severe the constraint is, only that all households in a group are constrained. The results therefore cannot be used in subsequent analysis to test the impact of predicted credit constraints on production, nutrition, and savings outcomes. Thus, the following method attempts to directly assess the existence of credit constraints (Zeller et al. 1996).

The second approach uses direct information from household surveys to find out whether a household is constrained. This information can be collected fairly easily and a (0,1) variable constructed, which takes on the value 1 if someone in a household is constrained. The usual assumption is that if even one person is constrained, the household as a whole should be considered constrained. This approach is extremely rare in the literature: Jappelli (1990) and Feder et al. (1990) represent the first empirical analyses. However, given the limitations of (0,1) variables, it is advisable to construct variables that directly measure the extent of credit constraints. While studies by IFPRI first focused only on the occurrence of credit rationing in informal and formal markets (see Zeller 1994; Schrieder 1995), recent field studies in Bangladesh and Malawi quantified the credit limit of survey households and their individual members. The credit limit for each household or individual—that is, the maximum amount that can be borrowed by the household or individual—is a much more informative variable for subsequent welfare analysis (Zeller et al. 1996).

The ability of economic decisionmakers to bear risk is conditioned by the line of credit available to them. For the analysis of credit impact, the credit limit has to be empirically measured, since even current

nonborrowers may benefit from a higher credit limit by being able to self-finance riskier projects if future consumption shortfalls can be covered by credit.

Table 11 provides information on credit limits based on a sample of 350 households in Bangladesh (Zeller, Sharma, and Ahmed 1996). In the survey, borrowers were asked the maximum amount of loan they could potentially borrow from each source. While the relatively better-off landowners (with more than 0.5 acre of land) reported the highest average credit limit in the informal sector, it was the participants in credit programs operated by nongovernmental organizations (NGOs) for the poor who reported the highest credit limit in the formal sector, indicating the dramatic way in which innovative credit programs targeted to the poor can improve access to credit by the poor. In this study, credit limits of nonmembers and members of three groups-based credit programs in Bangladesh, operated by NGOs, are compared. These

Table 11—Credit limits per capita, by survey round and NGO credit program participation, Bangladesh, 1994

Round/credit source	Participants	Nonparticipants	
		Owning less than 0.5 acre	Owning more than 0.5 acre
Round 1			
Informal sector (taka)	686	615	2,637
Number of observations	117	88	125
Formal sector (taka)	1,652	211	1,071
Number of observations	118	33	58
Round 2			
Informal sector (taka)	506	436	951
Number of observations	114	89	112
Formal sector (taka)	390	58	136
Number of observations	61	33	49
Round 3			
Informal sector (taka)	545	298	1,141
Number of observations	109	88	115
Formal sector (taka)	355	34	104
Number of observations	63	32	49
Average over rounds			
Informal sector (taka)	571	441	1,561
Number of observations	123	95	127
Formal sector (taka)	1,236	248	737
Number of observations	118	34	59

Source: Zeller, Sharma, and Ahmed 1996.

Notes: In 1994, 40 taka equaled US\$1. Participants are members of credit programs administered by NGOs in Bangladesh. The survey focused on BRAC, ASA, and RDRS credit programs. About 350 households were surveyed in three rounds during 1994. Most NGO credit programs target the landless (or those owning very small plots of land). Participants usually own less than 0.5 acre of land, and comparisons with landless nonparticipants are indicative of but not conclusive for credit program effects.

Table 12—Credit limits per capita, by tercile of years of credit program membership, Bangladesh, 1994

Item	Low	Medium	Upper
All rounds			
Mean years of membership	1.52	4.96	10.34
Formal (taka)	891.00	1,296.00	1,581.00
Number of observations	40	46	32

Source: Zeller, Sharma, and Ahmed 1996.

programs are the Bangladesh Rural Advancement Committee (BRAC), the Association for Social Advancement (ASA), and Rangpur-Dinajpur Rural Services (RDRS).

Further light is shed on how credit access improves with greater participation in Table 12, which compares the perceived credit limit of households belonging to the NGO credit programs by tercile of length of membership in the program. The average credit limit of those in the highest tercile is more than 75 percent higher than those in the lowest tercile, indicating a strategy of gradually increased lending taken by the credit programs.

These results show the occurrence and the extent of credit constraints. An important recent study on this subject by Kochar (1994) analyzes in detail the participation of households in rural India in informal and formal credit markets. She finds that many households, in fact, voluntarily choose not to borrow in the formal market or do not reach their credit limit. Therefore, few are rationed. But Bell, Srinivasan, and Udry (1990) found excessive credit rationing in the formal cooperative credit market of rural Punjab. They assumed, however, that the informal market would satisfy any spillover demand from the formal market. In fact, the informal market was assumed to have an interest-elastic supply and demand of credit.

Group-Based Financial Services and Food Security

A wide variety of group savings mechanisms exist. Communal-, age-, or gender-specific groups often perform agricultural, marketing, or artisan activities and save profits in kind (through communal food stores, for example) or in cash, held by a trusted group member. Some savings groups perform additional functions, such as the provision of basic health and accident insurance through mutual aid mechanisms.

Self-help groups (SHGs) are an important source of informal loans in many developing countries. An SHG is defined as a voluntary group valuing personal interactions and mutual aid as means of altering or ameliorating problems perceived as alterable, pressing, and personal by most of its participants (Smith and Pillheimer 1983). SHGs designed to

cope with daily problems enjoy a long tradition in developing countries. Prior to the monetarization of the rural economy, working and social associations dominated. Today, informal groups frequently offer assistance in savings and credit services. The organizational frameworks and the services rendered by these informal financial groups vary. The most frequently encountered types of financial SHGs found in Sub-Saharan Africa are savings associations, savings and credit associations, and credit associations.⁷ In all of these groups except the credit association, commitment to contractual savings is essential to become creditworthy. Contractual savings, peer pressure, and membership restrictions replace the need for other collateral. Membership and compliance with the group's rules suffice to gain access to its funds.

Informal credit and savings associations at the community level play a major role in many developing countries. Data on rotating credit and savings associations (ROSCAs), for example, in Cameroon and Nigeria, reveal that a majority of associations saved longer than one year, and that they accumulated substantial savings per member (Schrieder 1989; Seibel and Marx 1987). Apart from the savings motives stated above, the participants also reasoned that saving in ROSCAs protects income from unintended consumption, either their own consumption or that of others in the extended family (Jung 1987). ROSCAs appear to provide the right balance between distance and accessibility in cases of need, on the one hand, and protection from unintended use, on the other.

In many developing countries, ROSCAs are an important means to accumulate capital for larger investments in physical and human capital. A recent study by Besley and Levenson (1996), based on data from Taiwan, shows that membership in a ROSCA enables a significant accumulation of consumption durables. ROSCA participation is found to significantly increase capital accumulation—on the order of 6 to 45 percent. While this result indirectly confirms the potential importance of the link between capital accumulation and the availability of financial institutions, it further stresses the positive role that informal finance can play in development, even in an economy that has undergone significant modernization (Besley and Levenson 1996). Further indications about the importance of ROSCAs in the economy are found for Cameroon by Schrieder and Cuevas (1992). Based on a household survey, they estimate that informal groups provide for 27 percent of national loan requirements and contribute about 54 percent of total financial savings in Cameroon.

⁷For a complete description of the conceptual framework of financial SHGs, refer to Adams and Canavesi de Sahonero 1987; Ardener 1964; Bouman 1977 and 1979; Geertz 1962; Meyer 1940; Schrieder 1989; Seibel and Marx 1987; and Soen and De Comarmond 1972.

Clearly, financial self-help groups, such as ROSCAs, offer a wide variety of services and play an important role in capital accumulation, consumption credit, and insurance. However, these services are subject to constraints, foremost among them, the financial and geographical limitations of the group's activities. In addition, the homogeneity of the membership in terms of occupation and financial scope may endanger the group's financial stability. Natural hazards may prompt participants of a rural financial SHG to demand loans or emergency aid all at once. Due to the financial limitation of the group's funds, such demand peaks cannot be satisfied. Thus, informal financial groups are not well suited to insure against covariate risks such as natural or other hazards that affect all group members at the same time. However, linkage of informal or formal member-based financial institutions at the grassroots level, such as credit groups, with a liberalized banking sector could be an effective response to the threat of covariate risks. In the following, empirical evidence on the repayment performance of formal credit groups is reviewed.

The existing theoretical models of peer monitoring deduce that the repayment performance in group-lending programs is positively related to the homogeneity of members with respect to the riskiness of their projects (Stiglitz 1990; Devereux and Fishe 1993; Besley and Coate 1995). There is little empirical evidence to confirm or reject the models' hypotheses. Recent research seems to indicate that group members select each other in order to pool risks so that the likelihood of repayment is increased. The findings by Meyer, Nagarajan, and Graham (1995) suggest that homogeneity in gender matters little for repayment, but heterogeneity in employment and thus income generation decreases the delinquency rates in informal groups in The Gambia. Wenner (1995) shows that 75 percent of sample groups in Costa Rica had members defaulting on their loans, but more than half of these groups managed to repay fully the loan from the financial institution by using group savings or by forcing the cosigner of the loan to repay for the defaulter. Thus, the threat of lost access to future loans may induce members to set up implicit insurance contracts. Zeller (1996) finds that repayment rates of formal credit groups in Madagascar significantly improve with higher variance of the asset portfolios of the group members.

Bratton (1986) analyzes the repayment record of credit groups in Zimbabwe and shows that expectations about the peers' probability of repaying the loan influences the repayment of an individual member: group loans performed better than individual loans in years of good harvest, but worse in drought years. As argued by Varian (1990), such domino-like effects may be mitigated if group members are able to exclude potentially bad borrowers. Even if a group excludes willful defaulters, the occurrence of covariate shocks, such as drought, insects, or flood, may make it impossible for members to repay the loan. The

sustainability of group-lending programs in areas with high covariate risks will then depend on the ability of the financial intermediary to reschedule the loan of defaulting members or to raise emergency funds from members during normal years. Indeed, many group-based credit and savings schemes require a fraction of the loan amount to be deposited in an emergency fund, which is then used in a crisis to write-off or reschedule loans (see Chapter 4).

Several authors argue that strong incentives exist for groups to form among individuals with similar risk characteristics (Stiglitz 1990; Devereux and Fische 1993). If one individual is more prone to default than others, he or she is being subsidized, since the peers share the risk of default under joint liability. Thus, an individual with low-risk exposure would like to group together with other low-risk individuals. However, Stiglitz's model assumes that the probability of success or failure is independent of the peers' projects. This assumption appears to induce the model's result that groups form among individuals with homogeneity in risks. Analysis by Zeller (1996), based on a sample of 148 groups in Madagascar, indicates that individual members can exploit economies of risk by grouping with others who choose projects or specialize in income-earning activities that are negatively correlated with the expected returns from his or her own asset portfolio. Udry (1990) shows in his analysis that state-contingent contracts are chosen in informal credit markets in Nigeria, which allow for direct risk pooling between the creditor and the debtor. In these contracts, the amount reimbursed for the loan is contingent on the state (condition) of the borrower and lender. For example, if the lender experiences a negative income shock after having made a loan, but the borrower has normal or good income, the borrower may pay more back to the lender. Conversely, if the borrower is hit by bad luck, the debt may be forgiven or rescheduled. Lund (1995) derives similar conclusions for the Philippines. There appears to be no reason to believe that state-contingent contracts are implausible for members of groups with joint liability who want to maximize the utility from present and future loans.

Mathematical models of peer monitoring have focused on the risk attributes of the loan-financed project. However, members who wish to decrease the probability of peer default or want to coinsure themselves are likely to assess the riskiness of the overall asset portfolio chosen by the peer's household economy, not only the marginal effect on risk exposure due to an additional single project. Because family labor constitutes a major production factor, particularly in poor households, risk assessment of the peer's asset portfolio will not only take into consideration the consumption and production durables and financial assets possessed by the household, but also its human and social capital. The assessment of the riskiness of the household's asset portfolio may well encompass the household's available credit line in the informal credit market, alternative formal credit sources, and the household's claims to

the informal social security network, all influenced by the social connectedness or social capital of the household members (Zeller 1996).

Another argument for homogeneity in capital and economic activities among group members reasons that the costs of monitoring a member decrease if he or she is in the same trade as his or her peers (Devereux and Fishe 1993). While this argument is justified if everything else is the same, it ignores the question of how easily information about others is obtained in a village and other factors that determine access to information. The ability to pick up the relevant gossip in the village probably has little to do with one's occupation unless the individual runs the local teahouse or pub. A rice farmer having a carpenter as a neighbor may be in a better position to monitor the labor efforts, character, and good and bad fortunes of the carpenter than those of rice farmers at the other end of the village. Social cohesion, as it is manifested by similarity in social class, ethnic group, neighborhood, friendship, and kinship, appears to be a more important determinant of the ability to obtain information about peers than similarity in professional occupation. Sensitive information is expected to be more readily shared and less costly to obtain among socially cohesive groups. The analysis of repayment performance of credit groups in Bangladesh (Sharma and Zeller 1996) and in Madagascar (Zeller 1996) identifies social cohesion of group members, when defined as the number of common bonds between all members, as a positive determinant of repayment performance.

In summary, informal self-help groups and formal member-based financial institutions at the community level, such as credit groups, village banks, and cooperative societies, have various information and other advantages over socially and physically distant formal banking institutions. The integration of member-based financial institutions with the formal banking and cooperative sector has, therefore, the potential to combine the strengths of the formal sector with those of the informal sector.

Effects on Food Security of Access to Financial Services

Based on the conceptual framework presented in Chapter 1, improved access to financial services is basically expected to have two effects. It could help generate income or it could decrease the costs of consumption smoothing. There is now a rich literature dealing with estimating these effects. Many of the studies concentrate on the effects that access to credit may have on agricultural production, such as yields, technology adoption, or crop income. Few studies have attempted, so far, to analyze the effects on food consumption, in particular consumption smoothing, and on nutritional status. Most of the studies, however, are

plagued by methodological problems that bring the validity of the results into question (Zeller et al. 1996).

Earlier studies have been of two types. They either provide a comparative description of outcomes between borrowers versus nonborrowers (Araujo 1967; Daines 1975; Cordova, Masicat, and Herdt 1978; Colyer and Jimenez 1971) or involve econometric analyses of the production function or the input demand function explicitly specifying credit use (Becker 1970; Gyekye, Acquah, and Whyte 1977). David and Meyer (1978) raise three important methodological issues concerning these types of studies. First, studies that attempt to measure the impact of credit on income and welfare use the farm as the basic unit of analysis. Little attention is therefore given to the interdependence of production and consumption activities that is typical of most farm households. Second, and closely related to the first, a narrow focus on farm analysis overlooks the fact that loans are fungible. Third, it is important to address the attribution problem by separating the effect of loans from other factors simultaneously affecting income and welfare. For example, if nonprice rationing of credit results in a concentration of loans among larger and richer farmers, then the difference in outcomes between borrowers and nonborrowers may explain credit allocation rather than the impact of borrowing.

The basic problem in impact evaluation arises because it is impossible to observe what will happen to a household (or individual) if it participates in the credit program and also if it does not (Heckman and Smith 1995). When program participation is not random, selection bias is likely to result if evaluation is simply based on the difference in outcomes of participants compared with nonparticipants. To take Heckman and Smith's (1995, 88) example:

If persons elect to participate in a program precisely because of the poor alternatives available to them outside the program, nonparticipants will have outcomes higher than those that participants would have if they had not participated, implying a negative selection bias.

Pitt and Khandker (1994) use a quasi-experimental survey design to circumvent this problem. They make use of a survey that included communities in which there were no credit programs. This approach allows for the comparison between a "treatment group," living in communities with access to a formal credit program, and a "control group," living in communities without such access. The analysis of the effects of participation in group-based credit programs such as those of the Grameen Bank and the Bangladesh Rural Advancement Committee in Bangladesh shows positive and significant effects for most of the following outcome variables: school enrollment, asset holdings of women and men, consumption, and nutritional status of children. The analysis by

Hossain (1988) also points out positive welfare effects of the Grameen Bank. Furthermore, Pitt and Khandker (1994) find that credit provided to women is more likely to achieve positive outcomes than credit given to men. They conclude that program credit has a significant effect on the well-being of poor households in Bangladesh and that this effect is greater when women are the program participants.

Heckman and Smith (1995) provide a critical review of the experimental approach: it can, in principle, eliminate the selection bias, but it seldom gives information on the distributional consequences of the program on participants and nonparticipants. Furthermore, the possibility of substitution bias is eminent in studying the impact of a particular credit program on household-level outcomes. Substitution bias arises when members of an experimental control group (those living in a village without the particular credit program in question) gain access to close substitutes of the services provided by the program in question. For example, in studying the impact of the Grameen Bank in Bangladesh, the numerous other nongovernmental credit programs that target the landless could be close substitutes. If substitution bias is introduced through inappropriate random selection of villages having access to close substitutes to the program, the estimated impact on the program can be biased.

Yet another way of dealing with selection bias is to make use of panel data for households before and after program initiation. If such data are available, unobserved household characteristics could be controlled for using fixed effects estimation techniques (Zeller et al. 1996).

Feder et al. (1990) develop an alternative approach, using switching regression models. Hypothesizing that production functions of constrained households should differ from those of unconstrained households, since production and consumption decisions are inseparable for households that are constrained, they make the following assumptions:

- All farm households are unconstrained in all markets except the credit market.
- Some households are also constrained in the credit market. For these households, production decisions are influenced by household characteristics.
- Therefore, in estimating production functions, household characteristics should be included for constrained households and should be left out for unconstrained households.

The first step in the switching regression model is to estimate a variable that determines whether or not a household is credit constrained. In the second step, the estimated value of this variable is used in deciding which of the two regimes (constrained or unconstrained) applies in the second-stage regressions. Depending on whether the predicted value is one (for constrained households) or zero (for unconstrained

households), the production equation includes total liquidity and demographic structure as regressors for constrained households in addition to land, capital, education, and farm experience, which are common to all households.

The expectation is that the coefficient of total liquidity is positive and significant in the production function equation for constrained households, but the coefficients of the demographic variables are not. In addition, a "counterfactual" case can be estimated in which the version with total liquidity and demographic variables is run on the subsample of *unconstrained* households. The hypothesis is that these variables will be insignificant in this equation. Using a household sample from rural China, Feder et al. (1990) find that one additional yuan of credit in credit-constrained households can generate an additional output in the value of 0.235 yuan.

Zeller (1995) and Schrieder (1995) apply the switching regression model to data sets from Madagascar and Cameroon. The results suggest significant positive effects on income and calorie consumption due to improved access to informal and formal credit. However, in the case of Madagascar, the assumption of a perfect labor market can be questioned. In successive work, this assumption was tested by including labor market variables in the equations for the unconstrained households. Yet demographic variables like adult equivalent family size continued to be significant for unconstrained households (Zeller et al. 1996).

In a recent study on China, borrowing through formal credit sources was found to raise per capita calorie consumption by 316 calories, which represents a 14 percent increase at the sample mean. Also, the calorie response to incremental income changes was in the expected direction and significant for the poorest group (Zhu, Jiang Zhong, and von Braun 1996).

Foster (1995) relates household participation in credit markets to smoothing of fluctuations in the weights of young children in Bangladesh. He uses intertemporal equilibrium conditions that relate growth patterns of children to the cost of borrowing. The essence of this argument is that better access to credit means that weight growth will depend less on current income than in cases where borrowing constraints exist. His findings in Bangladesh show that growth patterns for children in landless households were influenced by credit market imperfections. Jacoby (1994) investigates the effect of borrowing constraints on the timing of human capital investment in Peru. Controlling for wealth and other determinants of human capital investment, Jacoby confirms the hypothesis that if parents are credit-constrained and child time has opportunity costs in the wage labor market, then the desire to smooth consumption will lead parents to gradually withdraw children from school.

Binswanger and Khandker (1993) used data from 85 districts in India for 1972–81 to investigate the effects of the supply-led agricultural

credit policy on agricultural output, nonfarm growth, employment, and rural wages. Their analysis suggests that the impact on agricultural output has been modest, so that costs of the public credit system may outweigh the benefits in additional agricultural output. However, rural credit had significant positive effects on nonfarm growth, employment, and rural wages.

Recent research stresses the positive role that access to credit markets can have for improving income generation, food consumption, and nutritional status as well as education. Rural finance policy for the poor is therefore increasingly seen as a strategy for poverty alleviation in rural areas of developing countries. Research on these issues is expanding, and future methodological advancements both in survey instruments and econometric modeling approaches are likely to provide more refined answers for quantifying the relationship between access to financial markets and household welfare.

Reaching the Poor: Implications for Institutional Design

Informal agents and self-help groups as well as other social networks based on community, kinship, or friendship provide insurance services in addition to savings and credit services, while formal institutions often narrowly focus on specialized production credit.

Savings motives appear to be consumption-oriented, that is, driven by health, education, social obligations, and housing needs, or they may be driven by precautionary motives for insuring against future food insecurity. Security and liquidity therefore, are the preferred characteristics of savings options rather than profitability, if risk-prone and vulnerable households are the customers of financial institutions (Schrieder and Cuevas 1992; Zeller, Sharma, and Ahmed 1996; Zhu, Jiang Zhong, and von Braun 1996).

Formal savings programs that aim to address the demands of the poor for savings services have to respond to their savings motives and preferences. This review of saving, borrowing, and insurance behavior has the following implications for product differentiation and program design. First, a viable program is needed that the participants trust—one that emphasizes the long-term viability and integrity of the institution. To gain trust, simple rules that allow participants to understand the banking process and to have partial control over terms and enforcement of contractual arrangements are necessary, especially in countries with weak legal enforcement. Second, transaction costs for depositing and withdrawing funds must be low, in order to attract potential savers. The cooperative or group-based approach is, in principle, a suitable form of grassroots financial institution that is member-based and member-controlled. Third, the program must offer savings lines with different

maturities. In order to address the savings motive for unforeseen events, especially among the very poor, a savings program may also offer insurance services for well-specified personal risks, such as illness or accident. Depending on the risk aversion and risk exposure of its target clientele, a financial institution may either stress the profitability motive of saving by offering attractive interest rates or by responding more to the demand for insurance and consumption credit.

Formal insurance and credit services for the poor are exposed to moral hazard, adverse selection problems, and high transaction costs for the financial intermediary, which make their provision financially unsustainable if appropriate lower-cost institutional arrangements are not exploited. Research into linkages between member-based financial institutions at the community level, such as credit groups, village banks, and cooperative societies, and the banking and cooperative sector must be further supported. The advantages of both the formal and informal institutions could then be combined to allow greater and more sustainable access by the poor to financial services.

Empirical evidence on the impact of improved access to financial services is still very limited. The few existing quantitative studies point out that access to rural finance has positive effects on income, food consumption, and nutritional status. While there is less contention about whether the effect is positive, its size is still unresolved: for example, the magnitude of the effect on income of an additional rupee of loan or an additional rupee of credit limit. Further improvements in methodology and data collection are necessary to be able to treat this research issue satisfactorily. Unless the benefits of rural finance are rigorously quantified, rules of thumb will continue to be used for judging how much, if any, public investment should be allocated to the formation of rural financial institutions in developing countries.

In conclusion, the formal sector should seek to address the poor's diverse demands for credit, savings, and insurance services. Finance for food security not only calls for agricultural production credit, but also for credit for consumption smoothing and income diversification, as well as the provision of savings options with different maturity, risks, and interest rates. Savings and credit services may also be interlinked with insurance services in order to better address the needs of households for consumption smoothing. Much remains to be learned from informal institutions in this respect. The survey of innovative financial institutions in the next chapter, however, demonstrates that such learning is taking place, and that new institutional arrangements are used to substitute for traditional, but inappropriate, banking technology developed for more affluent clientele.

4

Innovative Rural Finance for the Poor: A Food Security Perspective

The structure of rural financial markets in developing countries is typically dualistic; it consists of both formal and informal financial intermediaries with differing degrees of interactions between them. The formal intermediaries are subject to government and central bank regulations, while the informal financial sector may be influenced by but operates essentially outside of these controls. Five types of formal intermediaries contribute services to the rural financial market. Traditionally, these are commercial and development banks, specialized agricultural financial institutions, savings and credit cooperatives, and, during the last two decades, credit and savings programs administered by national or international NGOs.

The performance of many formal institutions in rural finance has been disappointing. Commercial and development banks have shown little interest in rural lending, particularly in lending to small farmers. Specialized agricultural credit institutions and NGOs have been able to extend credit to a limited clientele only. They have often suffered because recovery rates are low and margins narrow, while high administrative costs and lack of efficiency have led to losses and government dependency. A distorted macroeconomic environment that has repressed financial growth and left little room for dynamic development has added to their difficulties. The perceived high risks and transaction costs in small-scale rural lending, together with targeted credit extension for production purposes only, as well as a failure to provide other financial services, particularly savings opportunities, have alienated the major part of the rural clientele. In particular, the commercial and development banks have failed to design and offer conducive services

for the rural poor. In many cases, governments used rural financial institutions to provide political favors, especially before elections. The policy of "give and forgive" loans is seen as a major factor in explaining failures in development of financial markets.

Developing sustainable, broadly based financial markets with outreach into distant rural areas is a challenging task, especially when confronted with a complex set of issues. Some of these issues are internal to a rural finance program (Christen et al. 1995), whereas others are exogenous in the sense that their solution depends on changes in the sectoral and macroeconomic policy and institutional framework (Jayarajah and Branson 1995).

The large array of problem areas, their complexity, and the absence of empirically based solutions has contributed to the modesty that characterizes the new approaches being attempted.⁸ Most innovative programs are still pilot efforts operating on a limited scale. They often integrate elements observed in informal financial arrangements. Systematic research on the effects of these new approaches has started only recently. Nevertheless, it seems worthwhile to review the experience gained so far and to identify promising factors of success.

The lessons learned from the formal financial market failures, the thriving of the informal sector, the need to adapt to the general decline in foreign capital inflows, structural adjustment, and the rapid transitions in finance policies, techniques, and banking practices have encouraged most developing countries to reshape their approach to financial market development (World Bank 1989). It is widely recognized now that financial innovations are crucial in the economic development process, especially for financing small- and medium-sized enterprises and mobilizing local resources from low- and middle-income groups. Therefore, this chapter reviews those financial innovations found to be imperative to the development of the rural finance market and to the improvement of food security of the market's target clientele. The first section briefly defines and examines financial innovations in the context of economic development. A brief discussion of principal elements and issues of innovative financial market design as recognized in earlier literature follows. From these, performance criteria are derived and applied to the evaluation of financial institutions

⁸Recently, consumer theory and research methods, particularly conjoint analysis and plan maneuver games, have been employed to empirically assess the demand of Third World rural clients for various financial service profiles. Conjoint analysis provides a tool for financial institutions wishing to invest in the rural poor to empirically estimate the demand for different types of services and to design the appropriate service in a participatory effort (Schrieder and Heidhues 1991; Schrieder 1995). These techniques allow some internal problems of rural financial institution building and rebuilding to be solved.

and programs. Finally, essentials for the innovative design of financial institutions and research necessities are highlighted.

Financial Innovations in Development Economics

The role of technical innovations and their diffusion in the process of economic development has been recognized since the works of Marx, Schumpeter, and Kuznets. Institutional innovations have received greater attention only during the last three decades. Even less consideration has been given to the significance of financial innovations for food security.⁹ In principle, innovations are defined as new ideas, behaviors, products, or services that are substantially different from existing ones (Engel, Blackwell, and Miniard 1993; von Stein 1991). In the field of rural financial market development, Adams and Romero (1981) defined financial innovations rather narrowly as any change in the operations of a financial intermediary. They argue that an innovation may be either cost-decreasing or cost-increasing for the intermediary or the society or both. In contrast, Desai (1980b), Burkett (1988), and this review take a broader position that innovation in the sense of technical progress embodies the development of new products (services) or changes in processes, institutions, and market systems that raise efficiency. It should be pointed out that the cost-decreasing effect of an innovative financial service, in practice, may be difficult to assess, particularly if the costs are shifted from the financial intermediary to the client or society (Desai 1980b). Thus, what may appear as a cost reduction for the financial intermediary may, in fact, be a shift of costs to another level.

Considering the macro, institutional (sector), and micro levels of the financial intermediation process, financial innovations can be categorized as financial system innovations, financial institution innovations, processing innovations, or product and service innovations. In categorizing innovations in this way, it is important to keep in mind that the boundaries between the categories of innovation are somewhat fuzzy, and strong linkages exist between them (Schrieder and Heidhues 1995; von Stein 1991).

Financial system innovations relate to changes in the finance system as a whole. They affect all participants in the intermediation process. Typical examples are membership in a monetary union, the establishment of

⁹For more detailed information on the nature and characteristics of financial innovations, see Bhatt 1988; Binkowski and Beek 1989; Eilenberger 1991; Franzen 1988; and von Stein 1991.

new finance organizations, and changes in the legal and regulatory framework (Schrieder and Heidhues 1995).

The term *financial institution innovation* refers to changes in the structure, organization, and legal form of an institution (von Stein 1991). These changes may be caused by or made possible by financial system changes. Financial institution innovations often seek to overcome legal and economic constraints on the extension of financial services to market segments such as the rural poor. Such an innovation in the classical sense would be the transformation of an informal financial institution into a registered financial association (Schrieder and Heidhues 1995).

Processing innovations focus on improving the organization and the supply of products and services of a financial institution (von Stein 1991). Processing innovations are often based on technical progress, such as computerization, and are often introduced to increase efficiency and expand market shares.

Financial product innovations are defined as new or modified financial services that did not exist in the market before or differ substantially from existing services (Engel, Blackwell, and Miniard 1993; Franzen 1988; von Stein 1991). They can be categorized based either on their effects on consumer behavior (Engel, Blackwell, and Miniard 1993) or on their effects on the institution's risk, liquidity, and credit portfolio (Franzen 1988).

In assessing the contribution of rural financial institutions to poverty alleviation, all four categories of innovations play a role. System innovations can improve financial market integration and expand customer coverage; institutional innovations can improve service accessibility for the poor; process innovations are cost-reducing and increase institutional efficiency; and product innovations ameliorate the banking institution's orientation toward customer's demands. In offering demand-oriented, accessible, and sustainable financial services, financial institutions can significantly contribute to generating income and improving food security, specifically through the provision of

- production credit to finance income-generating investments and inputs;
- consumption credit to maintain and expand human productive capacity;
- quality savings schemes to efficiently manage liquidity over time and increase risk-bearing capacity; and
- insurance schemes to cope with personal and local covariate risks (Zeller 1995).

Particularly at the institutional (sector) and micro levels, many financial innovations for food security have been advanced. Thus, this chapter primarily discusses financial institution and product innovations at these levels. The search for financial innovations with a food security perspective leads to institutions that experiment with new forms of

collateral (institutional innovations), diversify their lending portfolio, and offer savings and insurance services (product innovations).

Development of Innovative Financial Institutions

It is a core message of this review that financial innovations ultimately expand and integrate capital markets, and, thus contribute to the acceleration of the pace of economic growth. Ultimately, economic growth will alleviate the worst forms of poverty and food insecurities in developing countries.

Innovative rural financial institutions with a food security perspective have common characteristics and key features. They almost always comprise savings schemes, diverse credit services, and appropriate collateral arrangements. Development of innovative financial markets also requires the strengthening and building of proper institutions in the rural financial market. This section summarizes key elements of rural financial market development that are suited to satisfy the needs of both the financial intermediaries and the rural poor, working toward economic progress and food security. The former require financial innovations that reduce intermediation risks and costs and foster institutional sustainability. The rural poor desire financial innovations that correspond to the ebb and flow of their liquidity to help adapt their disposable income to their food consumption needs.

Savings Schemes

In the 1980s, major development organizations such as the World Bank, the International Fund for Agricultural Development (IFAD), the German Agency for Technical Cooperation (GTZ), the World Council of Credit Unions (WOCCU), the U.S. Agency for International Development (USAID), and others began to recognize the importance of so-called "savings mobilization" and have revised their financial market development strategy accordingly (IFAD 1988; WOCCU 1990). By offering savings services, a financial institution can also promote greater customer loyalty and loan repayment discipline, thus reducing the institution's cost of funds for on-lending and overall transaction costs (Vogel 1987; Desai and Mellor 1993).

Domestic savings contribute to the stabilization of rural financial markets' liquidity as they ensure a continuing and sizable flux of resources, often exceeding governmental and donor refinancing lines at preferential interest rates (Adams and Vogel 1985; Cuevas and Graham 1988; Nguyen 1990). In addition, savings deposits reduce the risk of erratic shifts in the liability portfolio of financial intermediaries (Cuevas

and Graham 1988; Vogel 1987; von Pischke 1988). For savers, the major benefits of saving constitute the return on savings, the insurance against risks, the eventual access to credit, and the protection against theft and unintended consumption.

Despite these undoubted advantages, financial savings mobilization involves transaction costs for depositors and financial institutions. The transaction costs of saving financially determine savers' decisions to deposit funds. Because of women's diversified workload in household and business, they may experience even higher opportunity costs of forgone labor than men (Berger 1989). The transaction costs in collecting and withdrawing savings influence the intermediaries' attitude toward deposit collection.

In order to reduce transaction costs at the agent and client levels, many innovative rural financial institutions combine the collection of savings with the provision of loans or the collection of loan repayments. By combining both services, the unit transaction costs for lending and for collecting deposits can be reduced. Furthermore, alternative forms of collecting savings deposits, such as during weekly and monthly meetings of savings groups at the community level, can substantially reduce savings collection and transaction costs. Depending on population density, an agent may reach a sufficient number of clients by foot, as is the case with the Self-Employed Women's Association in India, which collects savings from urban women, or by bicycle, as is the case with the Bangladesh Rural Advancement Committee (BRAC) and the Grameen Bank in Bangladesh. As population density decreases, visits must necessarily become less frequent with decreasing branch density and increasing distance to customers (Desai and Mellor 1993).

Demand-Oriented Credit Services

An important feature of innovative rural programs is the diversity in the maturity, use, and risk portfolio of the loans offered. The provision of savings facilities and this change in the credit credo can be described as going from agricultural credit to rural finance (Adams 1995). The possibility of accessing loans of different maturities is important for rural households in order for them to invest in perennial cash crops and other longer-term investments, as well as seasonal food crop production and other short-term activities. The incremental cash income of investments in cash crops can improve food security (von Braun and Kennedy 1987). The diversification of loan uses refers to the recognition that production and consumption in rural households are intertwined.

Maturity. In developing countries, most credit programs offer short- and medium-term loans, with the first type regularly dominating the credit portfolio. However, long-term loans (more than five years) and very short-term loans (less than four months) are rarely disbursed.

The transaction costs for assessing and reviewing a credit application can be excessively high, especially for small loans. Innovative programs for the poor, therefore, delegate most of the credit appraisal process to member-based institutions at the community level (Christen et al. 1995). Their intrinsic knowledge capacity, willingness, and track record in repaying loans is available at little or no cost. Also, bank or extension agents often lack the capacity to judge the economic return of an investment or consumption activity, given that household-specific constraints need to be considered. Because of high costs of conducting appropriate credit appraisals, many rural credit programs shy away from any credit assessment and still continue to promote standard package deals that prescribe the amount of credit, often given in-kind, per hectare of a specific crop. These "package" loans have very little to offer in terms of individual customer service and building a relationship between client and financial institution.

Debt service installments of principal and interest ought to coincide with the cash flow generation of rural households. Moreover, a certain degree of flexibility regarding the repayment schedule would reduce the negative impact of natural hazards on borrowers' repayment capability. Such measures can generate a favorable environment for effective loan repayment (von Braun 1989; IFAD 1988).

Diversification of Loan Use. In the past, many credit programs were targeted to narrowly defined productive purposes. Credit was often given only to specific cash crop enterprises. The projects usually neglected the whole array of subsistence crops and nonfarm enterprises, which are especially important for women and for the poorest of the poor. Credit for consumptive purposes is still a controversial topic. Over the past decade, however, the trend to include consumption loans in credit programs has become more widespread, based on the recognition that consumption and production in rural households are intertwined and inseparable. Consumption loans are often productive because they preserve the productivity of labor, which is the main production factor in poor households (von Braun 1989; Heidhues 1992; Schaefer-Kehnert and von Pischke 1982; Zeller et al. 1994). The term "consumption loan" has been renamed by IFAD as "working capital loan" (IFAD 1988).¹⁰ The World Bank's *World Development Report 1990* stresses that investment in human capital, supported by working capital loans, contributes to the reduction of poverty.

¹⁰A wide variety of consumption loans for food, health, and clothing are, in their nature, working capital loans, since they enable the rural poor to meet their consumption needs and maintain their family labor force over a complete production cycle.

Portfolio Risk Distribution. Financial intermediaries must seek to spread their loan portfolio risk. The diversification of lending—including urban and rural clients and different income groups and professions—calls for broadly based, multipurpose intermediaries with flexible lending collateral policies. However, diversification has its trade-off in reduced exploitation of economies of scale. While theory calls for a trade-off point where marginal benefits of diversification equal marginal costs, the proper balance is, in reality, often difficult to determine. However, it is obvious that specialized rural credit institutions that lend to only a few crop enterprises are extremely vulnerable in times of drought or pests. Many failures of credit programs can be partially explained by insufficient diversification of their loan portfolio. With the worldwide sprouting of relatively narrowly focused NGOs engaging in micro-enterprise financing, the portfolio risk is often borne by the donors and by the clientele, in the case of institutional failure (McKee 1989).

Costs of Credit Operations

In the 1970s, it became evident that low-interest-rate credit programs in developing countries could neither fulfill their initial task of promoting economic development nor remain financially viable due to high transaction costs. Research has shown that these problems resulted, to a significant extent, from cheap credit policy and poor loan recovery (Adams and Vogel 1985; Adams, Graham, and von Pischke 1984; Donald 1976; Heidhues 1990; von Pischke, Adams, and Donald 1983; World Bank 1990a). The costs of lending and borrowing strongly determine whether the financial institutions engage in rural finance and whether the rural population can successfully access the formal capital market.

Transaction Costs. Interest rate restrictions and high transaction costs of lending often put undue pressure on the profit margin of formal institutions and endanger their viability. The banks react by treating large, relatively risk-free loans preferentially and bypassing small loans (Heidhues 1990; Schaefer-Kehnert and von Pischke 1982; Stiglitz and Weiss 1981). Gonzalez-Vega (1984) calls this credit rationing behavior “the iron law of interest-rate restrictions.”

The borrowing transaction costs largely govern the debtor's credit demand. In fact, Desai and Mellor (1993) show in their review that the loan demand coefficient is negative, but inelastic, regarding the interest rate. The lending transaction costs induce credit rationing on the creditor's side. Apart from liberalization of interest rate policies, emphasis needs to be placed on minimization of lending and borrowing transaction costs. By promoting financial institutions at the grass-roots level, the proximity of market partners allows lenders and borrowers, as owners and clients of member-based institutions, to substantially reduce both types of transaction costs.

Loan Recovery. Poor loan recovery and the resulting financial losses have been a root cause of many agricultural credit program failures. A variety of measures can potentially improve loan recovery. Evidence from various sources shows that group lending can induce better repayment rates. The stronger the social cohesion within groups—the higher the peer pressure and the awareness that defaulting on a loan will be at the expense of others or one's own future access to credit—the more successful group lending has proven to be. High repayment rates can be achieved through disbursing progressively larger loans if previous loans are fully repaid. But high loan repayment can also be obtained by sizing loans in proportion to previous savings records or by demanding a certain percentage of the loan to be saved before the loan is given. The African Rural and Agricultural Credit Association's (AFRACA) pilot linkage project in several African countries (Burkina Faso, Nigeria, and Zimbabwe) has produced encouraging results from this perspective (Seibel, Bassele, and Michell-Auli 1994). Management information systems can be particularly useful in identifying characteristics of borrowers that have been particularly good or bad for repayment. Such information can eventually lead to changes in contractual arrangements, cost reductions, and institutional innovation (Viganó 1993). Unfortunately, rural finance projects frequently lack such information systems and ignore the value of information for risk management and for institutional innovation.

One cannot stress enough the importance of financial services where the penalties of nonrepayment are predictable, clear, and consistently applied (Adams and Vogel 1985). Continuity of financial services, effective loan supervision, and quick enforcement of penalty measures may require that a financial intermediary has to invest in local outlets or set up linkages with member-based financial institutions such as groups, cooperatives, and village banks at the grassroots level. Otherwise, immediate corrective action is delayed in the cause-reaction chain.

Collateral Strategies for Lending to the Poor

Conventionally, land is the preferred or even the only collateral accepted by commercial and agricultural development banks. However, small farmers in traditional land tenure systems and the rural poor rarely hold the deeds to land. Also, the rural clientele might be reluctant to enter into self-binding contracts, such as a loan contract, because they fear losing their securities (Platteau 1992a, 1995). Substitutes for land and other asset collateral that are acceptable to and practicable for formal lending institutions therefore become imperative. Financial system and institutional innovations are necessary to permit formal banking institutions to engage in new collateral strategies, such as joint liability of credit groups.

Evidence from numerous innovative financial programs shows that group guarantee schemes are the most successful way to circumvent lack of physical collateral (Bratton 1986; Christen et al. 1995; Desai 1980a, 1983). Group mechanisms have also turned out to be efficient in improving the access of the poor, particularly women, to credit (Berger 1989; Holt and Ribe 1991; Otero 1986). Nevertheless, steady and reliable financial intermediation; close contact with groups and supervision; and appropriate group management, technical assistance, and training are crucial for the success of this financial intermediation strategy (Berger 1989; IFAD 1988; Lycette and White 1989).

Clearly, options other than group guarantee schemes are available for replacing traditional land collateral requirements. These include a thorough appraisal of the loan applicant's creditworthiness and character, credit lines linked to savings programs, and the subscription of equity shares as a percentage of the demanded loan.

Credit-linked savings programs can be designed flexibly to suit specific credit program objectives. They may be designed narrowly to promote selected investments or openly to provide loans for any given investment opening. Deposit intervals and amounts may be predefined or not. Loans granted on the basis of savings schemes may represent a certain percentage of the accumulated deposits, and the savings account may be fully or partially blocked for the loan period. The amount that has been blocked cannot be withdrawn by the loanee unless the loan is fully repaid. Security deposits of a certain percentage of the loan act as nonvoluntary savings. In the case of a group loan, the group often benefits from this security deposit by earning interest, and the lending institution can easily collect the collateral if the loan is not paid, although the collateral is generally of less value than the loan principal (Desai 1980a). Along a similar line, savings and credit cooperatives may oblige borrowers to subscribe shares as a percentage of the demanded loan. Experience shows that savings schemes, share purchases, and security deposits can be well suited as physical collateral replacements.

Pawnshops are another possibility for overcoming the collateral problem (Skully 1992). They can provide a quick and convenient source of loans for a wide range of people from urban and rural sectors. Pawnshops normally offer small, short-term loans against receipt of a pawned item, usually worth more than the loan amount. If the borrower does not repay the loan, the pawned item is appropriated. Pawnshops may accept a wide range of durable consumer and household goods as collateral, but they generally prefer gold and other jewelry. In East Asian countries, pawnshops successfully operate small-scale lending schemes and earn a sizable profit. Even some formal financial institutions have adopted them. Bouman and Bastiaansen (1989) found that the People's Bank in Sri Lanka became profitable when its rural branches added a pawnbroking service to their business.

Institution Building

Rural financial market development relies heavily on the confidence of the target clientele regarding the quality of the services offered and the reliability of the financial institutions. Satisfying the client in these respects is a predominant task of institution strengthening and building. This requires an institutional environment where the education and infrastructure systems enable the employment of qualified and motivated staff of highest integrity, where competitive market structures exist, and where contracts can be enforced, either through an effective legal framework or a system of binding social norms (Jayarajah and Branson 1995; von Pischke, Adams, and Donald 1983; WOCCU 1990; World Bank 1989). In the light of ever tightening funds for institution building and the necessity of improving the coverage of the rural poor, the rehabilitation and strengthening of already existing rural financial institutions becomes particularly important.

A promising innovation targeted at strengthening the rural financial intermediaries and improving their accessibility for the poor is the institutional integration of indigenous community and wealthy elite groups. In Cameroon, the Caisse Commune d'Épargne et d'Investissement (CCEI-Bank) applies a participatory elite-group approach where urban elites are encouraged to build and sponsor a community bank in their village of origin (CCEI-Bank 1992). The CCEI-Bank assists the elite groups in technical banking aspects during the foundation of the Mutuelles Communautaires de Croissance (MC2). The CCEI-Bank outsources the extension work and the mobilization of the operational MC2 capital stock to the elite group. Thus, it transfers most of its transaction costs of institution building to the elite group and MC2 members. The MC2s thrive on a financial system and institutional innovation. The CCEI-Bank negotiated a special agreement with the Ministry of Finance guaranteeing that all MC2s that adhere to the CCEI-Bank would have a direct link to the formal capital market. The program started in 1991 and has assisted to date nine MC2s. Six MC2s are located in the West Province of Cameroon and comprise about 1,600 members (Bomda and Schrieder 1995). These institutions satisfy a variety of their participants' needs on a sustainable and flexible basis, often at low cost (Bédard 1991; Kropp 1990). Their weakness is their fragmented and isolated way of operating, thus rendering interregional intermediation difficult. To use their strength and overcome their fragmentation, attempts have been made to build linkages among local self-help groups and between them and formal institutions (Kropp 1988; Seibel and Marx 1987).

The appreciation of indigenous groups led to a modification of earlier institutional development approaches. Instead of top-down schemes, many development institutions now pursue the building of financial systems from the bottom up. WOCCU, for example, pursues

a two-step, bottom-up institutional development approach. In the short run, bottom-up institutional development predominates. In the second phase, the development concentrates on institutional consolidation. This follow-up step comprises training in cooperative organization, regulations, monitoring, and eventually computerization (WOCCU 1990).¹¹

While SHGs and NGOs offer significant advantages in reaching the poor at the grassroots level, it is important to recognize their limits in interregional and intersectoral financial intermediation. SHGs and NGOs are locally focused and based on socially affined groups. Their capability for term transformation and coverage of risks is limited. Their inherent quality and very reason for existence arise from their grassroots character. This may be lost if the institution grows. For these reasons, Tendler (1989) argues that individual NGOs are often limited in improving the economic situation of a large number of rural poor. However, it is argued here that member-based financial institutions such as cooperatives, village banks, or savings and credit groups at the community level can provide the institutional flexibility needed to operate in highly segmented rural financial markets. NGOs can play an important role in forming such member-based institutions, which are then integrated with the formal banking and cooperative sector.

Financial Institutions with a Food Security Perspective

Rural financial policy has as its final objective to contribute to economic growth and poverty alleviation. An important aspect of poverty alleviation is food security. The success of rural financial programs can be measured using three criteria. These are (1) coverage of the poor and their demand for financial services; (2) accessibility, particularly equal gender access to the program; and (3) financial viability and sustainability in providing services. With these criteria, various innovative institutions and programs are assessed here with reference to their effect on food security. This assessment is mainly based on a review of reports available; in addition, field visits to some of the institutions have been made. The selected institutions serve merely as examples of the existing

¹¹Several development organizations promote informal groups to strengthen the institutional framework of financial markets (Lieberson, Kotellos, and Miller 1985; Bédard 1991; IFAD 1988; Kropp 1990). USAID frequently relies on informal groups in their efforts to create viable cooperatives. IFAD practices a comparable institutional development strategy in Indonesia, Nepal, and Sri Lanka. The German Agency for Technical Cooperation (GTZ) has supported programs to link financial self-help groups with formal financial institutions in several African and Asian countries.

diversity and therefore are by no means exhaustive. Many more institutions could have been listed.

Demand Orientation

Development agencies and rural financial institutions in developing countries recognize more and more the need to address poor clients' financial service demands. The traditional task of agricultural credit was to finance investments, inputs, and marketing. Production credit is demanded by the rural population to increase incremental income from on- and off-farm enterprises. However, other financial demands, such as savings services, consumption loans, and insurance services, have been neglected in the business portfolio of rural financial institutions.

Consumption Loans. As shown in Chapter 3, there is ample evidence that informal credit sources do not restrict their funds to conventionally considered productive purposes (Bouman and Hartefeld 1976; Miracle, Miracle, and Cohen 1980). In the portfolio of informal financial institutions, consumption loans for food, health, education, and social obligations play an important role, often accounting for a higher share in total lending than loans for agricultural production and other income-generating activities.

Rural women especially have a strong demand for consumption loans for various reasons. In many parts of West and Central Africa, women have an equal need to invest in income-generating activities and in family welfare (Berger 1989). Nevertheless, their financial liquidity is often limited. They must divide their restricted liquidity between productive and consumptive expenditures. Given the choice between a financial institution that offers production loans exclusively and one that offers a combination of production and consumption loans, 52 percent of rural Cameroonian women interviewed in 1992 derived a higher utility from the latter option (Schrieder 1995).

Most of the selected nonbanking and half of the banking institutions offer consumption and social credit (Table 13). The presence of human capital loans does not necessarily interfere with the sustainability of financial market development programs. Based on surveys in Benin and Cameroon, the repayment performance was found not to vary much; repayment rates for production loans were 95 and 85 percent versus consumption loans of 90 and 89 percent in the survey regions of the two countries, respectively (Heidhues 1992). A similar result was found in a survey of rural households in Madagascar (Zeller et al. 1993).

An interesting approach in securing demand orientation in a credit program is followed by the ANADEGES/COPIDER Program in Mexico. The rural poor themselves, campesino and Indian groups, identify the services to be provided. Campesino and Indian groups have to take the initiative; ANADEGES only provides information and advice when specifically asked for it. The program is primarily geared

Table 13—Demand orientation of innovative rural finance schemes

Institution	Production credit	Consumption/ social credit
Zimbabwe Savings Club Movement	No	No
Cameroon Cooperative Credit Union League (CamCCUL)	Yes (56 percent of loans outstanding end 1987). Emphasis on construction, trade, and small farmer production credit	Yes (44 percent of loans outstanding end 1987) with emphasis on education and social obligations
Liywontse Association of Nkar, Cameroon	Yes	Yes. Emphasis on education loans
Caisse Villageoise d'Epargne et de Cr�dit Autoger�e (CVECA), Mali, The Gambia, and Madagascar	Yes	Yes (20 percent of credit extended)
Fonds de D�veloppement Villageois Segou, Mali	Yes	...
Caisses Villageoises d'Epargne et de Cr�dit de Banh, Burkina Faso	Yes. Emphasis on income diversification	Yes. Out of loans extended, a village fund for emergency cases created
Malawi Mudzi Fund, Malawi	Yes	No
Badan Kredit Kecamatan (BKK), Central Java	Yes	...
Bangladesh Rural Advancement Committee (BRAC)	Yes	Yes (less than 1 percent)
Banking institutions (poverty focused)		
Grameen Bank	Yes to "poor" only (0.5 acre of cultivatable land or assets equal to value of 1 acre). Majority of loans for income diversification	Yes

Note: Leaders (...) indicate that no information is available.

"Similarly, Caisse Villageoise d'Epargne et de Cr dit Autoger  in The Gambia and individual risks of loan default such as illness or individual crop failure. These village (CIDR). Foundation for International Community Assistance (FINCA) has pioneered other developing regions.

for the poor

Extension, marketing, and input supply services	Savings mobilization	Individual and covariate risk coverage
Bulk purchase of inputs and sale of produce	Yes	...
Training in agriculture and farm management	Yes	...
Bulk purchase of inputs	Yes	Yes, individual risk only
Services	Yes	Yes, individual risk only ^a
...	Yes, through Village Savings Fund	...
Training and extension	Limitation without savings; savings mobilization later added	Yes, individual risk only
Extension and marketing	Yes	Yes, individual risk only
No	Yes (obligatory and voluntary scheme)	...
Training and services in health, agriculture, education	Yes	Yes
Social services, extension training	Yes (obligatory, linked with loan disbursement)	Yes

Madagascar have set up emergency funds, at the decision of group members, to cover banks are supported by Centre International de Recherche et de Développement village bank concept, implementing programs not only in Latin America, but also in

to support production, but it also funds credit for other needs, and ANADEGES encourages borrowers to use the money whenever possible to derive benefits outside of those approved. The impact of the program has ranged from successful to extraordinary—with only a few failures (Medellin-Erdmann and Kropp 1991).

The program relies entirely on the groups' commitment to the program, group members' sense of responsibility to each other, participatory management, and understanding that the program is funded by so-called solidarity funds; borrowers know that defaulting means that these funds are not available to support other campesino or Indian groups.

Most of the financial programs (formal and informal) discussed in this review are demand-oriented in the sense that they allow their members to use at least part of their loans for consumption. The Cameroon Cooperative Credit Union League (CamCCUL), for example, does not discriminate against loan demands for health and educational purposes but, at the same time, it strongly promotes productive investment loans. For this purpose, CamCCUL designed a special Small Farmer Production Credit Program. BRAC-Bangladesh also extends consumption loans to its members, mainly to keep them from selling their assets in times of emergency. It limits the amount of consumption loans, however, to 75 percent of a member's total savings with BRAC (BRAC 1992; Jahangir and Zeller 1995). The Liywontse Association of Nkar, Cameroon, recognizes the credit needs of its members for educational as well as production purposes. Connected with the liberal attitude toward credit use is a carefully designed repayment schedule, which coincides with the income flows of the rural smallholders in the region.

However, some programs hesitate in completely liberalizing credit use. In the Liywontse Project in Cameroon, borrowers frequently reassigned education and agricultural loans to other consumption purposes that were not planned for in the program. Therefore, the association decided in February 1990 to grant agricultural loans in-kind and disburse loans for school fees and tuition directly to the school. Doubts about this form of targeting were expressed in a GTZ evaluation report that criticizes this business policy as patronizing (Bürgel, Traut, and Hucke 1990).

Savings. As discussed in Chapter 2, savings options improve the ability of rural households to adjust ex post their investments and consumption.¹² It relaxes the stress on disposable income and improves their risk-bearing capacity. Most of the institutions listed in Table 13 offer savings facilities. Research on savings motives indicates that provision of deposit facilities responds to an important demand of rural households (Jung 1987; Heidhues 1992).

¹²See also Zeller 1995.

Several financial market development schemes expose their clients not only to voluntary but also to mandatory savings schemes (Table 13). These are, for example, the Grameen Bank in Bangladesh, CamCCUL in Cameroon, the Liywontse Association of Nkar in Cameroon, the Burkinabé Caisses Villageoises d'Epargne et de Crédit de Banh in Burkina Faso, and the Malawi Mudzi Fund.

Poor women in particular want economic security and stability. This desire seems to translate into a higher propensity to save and adoption of a less risky, smaller-loan-with-higher-loan-repayment behavior than that of male borrowers. Since women in developing countries are involved in diverse, short-cycle productive activities, they need savings instruments with a high degree of liquidity (Otero and Downing 1989). Therefore, offering deposit facilities meets an existing and relevant part of the demand for rural financial services. This is confirmed by the successful development of the Zimbabwe Savings Club Movement, which dates back to 1963. Besides savings facilities, it offers women nonfinancial assistance, such as the provision of agricultural inputs. The primary task of Zimbabwe's savings clubs is the generation of savings for productive investments. The group's savings are deposited at a local bank branch. Zimbabwe's savings clubs do not grant loans, however. Members can only withdraw their accumulated savings. In providing deposit services, the clubs satisfy two demands. First, the clubs act as an easily accessible safekeeping institution that can be used to self-finance investments and to dissave in case of consumption expenditures. Second, savers benefit from price advantages through the clubs' bulk purchase of agricultural inputs. In Zimbabwe, the group savings mechanism has proven poor women's capacity to save in monetary form (Caputo 1989; Chimedza 1989; Radke et al. 1986; von Pischke and Rouse 1982).

To provide savings services first and then to offer credit services, which are at least partially funded by clients' deposits, is a commonly recommended strategy. However, exceptions to this exist. For example, in the mid-1980s, when the Burkinabé Caisses Villageoises d'Epargne et de Crédit de Banh started a financial intermediation program, savings mobilization prior to lending was not feasible. This example demonstrates that in specific cases, whether savings precede lending or not may not be important as long as rural households begin to save as soon as their income situation enables them to save. A severe drought and subsequent decapitalization of rural households in the project area forestalled the savings-first approach. Thus, the project's first task was not savings mobilization, but recapitalization (Kabore 1990). For this reason, the project initially extended loans without operating a savings scheme; a voluntary savings scheme was introduced only with a six-month delay in January 1989 (Diop 1990). In December 1989, the project started a preliminary, compulsory savings program. The present compulsory savings scheme (active since May 1990) is composed of

a village group fund and a security fund. From each loan granted, 5 percent is set aside for the village group fund and 2 percent for the security fund. The building of savings capacity among its clientele is one of the program's main accomplishments. Project evaluation documents indicate an improved food consumption situation, since part of the financial income can be set aside for future investment and consumption (Elsäßer and Diop 1990; Kabore 1990).

The members of the Malawi Mudzi Fund and BRAC-Bangladesh must also adhere to regular savings. The Malawi Mudzi Fund's savings are accumulated in a group fund and the risk fund. The group fund is composed of an initial single group deposit, the group's regular savings, plus mandatory savings representing a small fraction of the disbursed loan (Otero and Downing 1989). Under the Rural Credit Program of BRAC, a member is required to save at least 2 taka (Tk) per week (about 2.5 U.S. cents). The savings are collected by a BRAC project assistant and deposited in the member's savings account. In addition, 4 percent of the loan amount granted is deducted and deposited in a group trust fund. This fund is used to extend grants to the members in the event of emergencies. BRAC's average annual growth rates since 1987 have been 64 percent for savings and 72 percent for loans (Alam 1992; BRAC 1991, 1992; Jahangir and Zeller 1995; Zeller, Ahmed, and Sharma 1996).

Insurance Features. As shown in Chapters 2 and 3, theory and empirical evidence on insurance services provided by informal institutions stress the economic demand of the poor for insurance services. The Burkinabé Caisses Villageoises d'Epargne et de Crédit de Banh recognizes this insurance demand (Table 13). It successfully combines lending operations with the clients' need to ease personal emergencies. As long as no loan default occurs, credit groups may resort to the above-mentioned village group funds to extend emergency loans to group members. This insurance mechanism is designed to cover individual risks. The Grameen Bank, BRAC, the Caisses Villageoises d'Epargne et de Crédit de Banh, and the village banks in The Gambia, Madagascar, Mali, and Senegal (Le Breton 1991) provide limited coverage of individual's risks of loan default, such as illness or death of family members, via group emergency funds. However, these schemes have by no means the capacity to capture covariate risk.

BRAC's Rural Credit Program comprises an innovative insurance service (Table 13). Its aim is to protect the aging program members from the neglect of their households as they become less and less productive. An insurance policyholder nominates a beneficiary to whom Tk 5,000 is delivered within 24 hours of the policyholder's death. Clearly, this monetary benefit encourages the nominee of the policyholder to take good care of him as he ages (Jahangir and Zeller 1995).

Protection against covariate risk affecting the whole community or region, often caused by natural calamities or political instability, can hardly be provided by local finance institutions. Horizontal or vertical integration into a regional or national finance system with reinsurance mechanisms is, therefore, required for local rural finance programs, given that they have proven to be sustainable. Mechanisms that cope with covariate risks can be effective in stabilizing consumption of rural households. None of the institutions reviewed offered explicit covariate-risk insurance. However, the Grameen Bank in 1993 re-scheduled all loans in flooded areas of Bangladesh.

Accessibility for the Poor

The impact of rural financial institutions on the food security level of the target population depends on the degree of financial deepening in terms of coverage and services provided (Heidhues 1995). A broad-based clientele, including the poor and particularly women, is conditioned by the accessibility of the institution (Table 14). Access barriers that constrain the participation of the poor in financial intermediation (von Pischke, Adams, and Donald 1983) are

- eligibility requirements, such as a minimum savings balance, a minimum credit amount, membership fees, eligibility certificates, withdrawal restrictions, and so forth;
- transaction costs in connection with depositing and withdrawing savings;
- transaction costs of borrowing and debt service payments; and
- collateral and security requirements.

An example of a truly participatory approach to rural financial institution building and definition of rules of access by the community are the *Caisses Villageoises d'Epargne et de Crédit Autogérées* (CVECA) in several Sub-Saharan African countries (Table 13). The CVECAs are member-owned and member-controlled village banks that offer savings services and loans to their members. Under the financial support of *Kreditanstalt für Wiederaufbau* (KfW), *Centre Internationale de Développement et de Recherche* (CIDR), a French nongovernmental organization, has promoted the formation of village banks in Cameroon, The Gambia, Madagascar, Mali, and Senegal (Chao-Beroff, Egger, and Moreno 1991). It provides technical assistance and training to the villagers in bookkeeping and in defining the rules of conduct of the bank. However, it is the members themselves who decide, for example, (1) the level of interest rates to be paid for savings deposits, (2) membership fees, (3) the level of interest rates for member-financed loans, and (4) appraisal of the loan application. This participatory approach allows for the existence of several banks in one village, each serving several segments of the population that have similar ethnic or other socioeconomic characteristics. Since the banks have to mobilize

Table 14—Accessibility of innovative rural finance schemes for the

Institution	Formal (F) or informal (IF) institution	Gender orientation
Zimbabwe Savings Club Movement	IF	F/M 97:3
Cameroon Cooperative Credit Union League (CamCCUL)	F	M/F 75:25
Liywontse Association of Nkar, Cameroon	IF	F/M 75:25
Caisse Villageoise d'Epargne et de Crédit Autogérée (CVECA, in Mali, The Gambia, and Madagascar)	IF	M/F 79:21
Fonds de Développement Villageois Segou, Mali	IF	M
Caisses Villageoises d'Epargne et de Crédit de Banh, Burkina Faso	IF	F/M 90:10
Malawi Mudzi Fund, Malawi	F	M/F
Badan Kredit Kecamatan, Central Java	F	F/M 60:40
Bangladesh Rural Advancement Committee (BRAC)	IF	F/M 70:30
Banking institutions (poverty focused)		
Grameen Bank	F; 75 percent of shares owned by borrowers, 25 percent by government	F/M 74:26 (1988) 91:9 (1989)

Notes: n.a. is not applicable. Leaders (. . .) indicate that no information is available.

poor

Minimum balance membership fee	Collateral requirements	Formal/informal sector linkage
None	n.a.	Yes, through savings deposits
One membership share mandatory	Savings deposits with leverage of 1:5	Yes
Admission fee for member groups and two shares per year subscription	Group lending, group responsibility; savings deposits with leverage of 1:3	Yes
Differs among the institutions	Approval by peers	Yes
...	Village savings fund for loans to village; leverage of 1:10	Savings deposited with Banque Nationale de Développement Agricole (BNDA); rural windows of BNDA
No	Joint group responsibility	Yes
No	Joint group liability	Yes
No	None (character reference and approval by local officials, peer pressure by village head)	Yes
Membership in a group, regular savings payment	Savings/group adherence	Yes
Membership in a group, regular savings payment	Loans extended to groups under joint liability	Depositing liquid funds at other banks

their own funds and need to compete with the informal financial market, their interest rates for loans are higher than those charged by relatives and friends, but lower than those charged by socially distant lenders (Zeller 1994).¹³

BRAC-Bangladesh provides an example of wide accessibility for the rural poor, particularly for women (Table 14). It is Bangladesh's largest NGO, and its activities are directed primarily to the landless rural poor.¹⁴ BRAC's membership grew over the six-year period 1986-92, from 120,000 to more than 700,000 (70 percent of whom are women); savings rose twentyfold and loans even more. The loan repayment rate is more than 90 percent. A pilot project by the Indonesian Central Bank, which links banks with self-help groups, has also had successful outreach. Some 1,250 savings and credit groups had been formed by 1994. Loans were disbursed to 30,000 individuals, of whom 46 percent were women. For about 60 percent of the borrowers, the value of their productive assets rose on average by US\$63 (Kropp 1995).

In Central Java, the poverty-focused financial institution, Badan Kredit Kecamatan (BKK), provides credit lines with various loan maturities and market-based returns to savings (Yaron 1992b). The clientele of BKK are generally poor, and 60 percent are women. Especially noteworthy is BKK's voluntary savings scheme, which offers remunerating interest rates to small savers and, as a result, its savings volume is growing rapidly. The average savings deposit is only \$6; the average loan amount, \$26. No physical collateral is required to obtain a loan. Loans are disbursed on character references and recommendations by village chiefs. If the borrower defaults, he or she loses future access to BKK loans. On the other hand, prompt repayment gradually increases the borrower's credit limit with BKK.

In Cameroon, credit unions address a type of clientele that has no access to commercial banks. Although CamCCUL does not exclude rural clients, it recruits the majority of its members from urban and semiurban environments. The coverage of rural areas and the financial effectiveness of rural credit unions is inferior to urban ones, presumably because of higher transaction costs. Nevertheless, CamCCUL's sustained membership growth indicates that its savings and credit terms do not represent access barriers to small savers and borrowers. Moreover, the overall financial deepening indicator (branches per 10,000 persons) for credit unions and commercial banks was 0.319 in 1993 and 0.137 in 1990 (Schrieder 1995). This illustrates that coverage

¹³This finding has been obtained for the CVECAs in The Gambia and in Madagascar (Zeller et al. 1994).

¹⁴BRAC's definition of landless rural poor refers to people who do not own more than 0.5 acre of land, including their homestead. In addition, they must earn their livelihood through manual labor for at least 100 days a year (Alam 1992; BRAC 1991).

and accessibility may differ significantly, depending on the institutional form of the financial intermediary. There is ample evidence that Cameroonian credit union members have benefited. The members' upgraded economic status resulted in changing financial needs, especially more financial market integration. Therefore, CamCCUL has applied to the Ministry of Finance to open its own bank, the Union Bank.

The group-lending approach is an important financial innovation to improve financial market accessibility. Most of the financial intermediaries shown in Table 14 employ a group-lending approach and do not require any asset collateral. These include the Grameen Bank, the Burkinabé Caisses Villageoises d'Epargne et de Crédit, the Liy-wontse Association of Nkar, the Malawi Mudzi Fund, the Indian Self-Employed Women's Association (SEWA), and the Working Women's Forum (WWF). All of these programs provide financial services predominantly or exclusively to women. It appears that women's organizations such as SEWA and WWF that offer financial services are especially successful in improving their target clientele's access to credit.¹⁵ First, local powerholders are excluded from the role of credit brokers, intermediating between banks and clients through patron-client relationships often at high cost. Second, the group-lending approach reduces individual borrowing transaction costs. Both factors help to minimize the clients' total transaction cost.

Financial Viability

Sustainability requires that rural financial institutions and programs be financially viable. The most appropriate quantitative indicator is the subsidy dependency index (Yaron 1992b). However, because accounting data are lacking for most of the institutions discussed here, other factors may indirectly indicate, to some extent, whether institutions operate in a cost-covering way (Table 15). These indicators cover the

- subsidization level,
- administrative costs,
- loan recovery rates,
- length of operation,
- growth and diversification of activities, and
- the source and cost of funds.

Deposit mobilization contributes to the stabilization of a rural financial institution's liquidity and solvency (Adams and Vogel 1985; Cuevas and Graham 1988; Lieberson, Kotellos, and Miller 1985; Nguyen 1990). This financial base reduces dependency on government

¹⁵SEWA has reached 15,000 members and WWF, 38,000 members. Most are urban poor women. In comparison, the Grameen Bank has serviced 500,000 members, mainly rural clients (Berger 1989).

Table 15—Financial viability and sustainability of innovative rural

Institution	Subsidization	Covering administrative costs
Zimbabwe Savings Club Movement	None	Yes, honorary management, simple accounting
Cameroon Cooperative Credit Union League (CamCCUL)	Yes, technical assistance	Yes
Liywontse Association of Nkar, Cameroon	Yes ^a	...
Caisse Villageoise d'Epargne et de Crédit Autogérée (CVECA) in Mali	Yes, assistance given	Low administrative costs
Fonds de Développement Villageois Segou, Mali	Establishment assistance by Banque Nationale de Développement	...
Caisses Villageoises d'Epargne et de Crédit de Banh, Burkina Faso	Establishment assistance and training	Expected at full development
Malawi Mudzi Fund, Malawi	Yes	No
Badan Kredit Kecamatan, Central Java	Yes, but moderate	Yes
Bangladesh Rural Advancement Committee (BRAC)	Yes, but moderate	...
Banking institutions (poverty focused)		
Grameen Bank	Yes, through grants and low-interest loans from donors	No. Total costs (administration and finance) are 26.5 percent of loans if funds were provided at market rates (21.7 percent at actual costs of funds). Financial viability is secured through liquid funds investments (50 percent of income derives from bank deposits).

Notes: n.a. is not applicable. Leaders (...) indicate that no information is available.
^aSubsidy paid in relation to good recovery performance.

finance schemes for the poor

Recovery rates	Year established	Growth
		(number of members)
n.a.	1963	2,000 (1967) 1,000,000 (1989)
74 percent (1991)	1968	50,000 (1983) 72,000 (1989)
74 percent (loan repayment inactive)	1987	...
Near 100 percent	1985	Start 1985; 24 groups in 1989
Near 100 percent	1984	Start 1984; 85 villages (1988) rapid growth of savings
98 percent	1988	Expanding rapidly
Over 90 percent; during early 1990s, below 90 percent	1988	...
80 percent (arrears rate defined as loan not fully repaid at due date for final installment)	1970	510,000 (1990)
...	1972	Start 1972; 121,747 (1986) 707,172 (1992)
99.5 percent; 96.7 percent (recovered before one year past maturity)	1976 (17 years as action-research project; 12 years as bank)	58,000 (1985) 250,000 (1986) 660,000 (1990)

and donor funds (Adams and Vogel 1985; von Pischke 1983). Empirical evidence from Bangladesh, Cameroon, the Dominican Republic, Guatemala, Honduras, Rwanda, and other economies has shown that credit unions have been successful in mobilizing savings (Huppi and Feder 1990). Furthermore, savings mobilization provides financial intermediaries with information about the solvency and reliability of their clients (Vogel 1987). This information greatly facilitates and reduces costs of creditworthiness appraisals. Moreover, empirical evidence shows that debtors are more likely to honor loan obligations when they keep their deposits at the lending institution. This is especially true for member-based financial institutions in which the members' proper savings are at stake.

The Cameroonian credit union movement (CamCCUL) represents one of the more successful financial market development stories in Sub-Saharan Africa, measured by the level of subsidization and the growth of membership. Loan delinquency has been the major constraint of the CamCCUL credit union movement.¹⁶ In addition, the financial viability of CamCCUL was seriously affected by economic crises in the 1980s. Today, it faces problems resulting from inaccessible reserve deposits held in illiquid commercial banks. As a reaction to this experience and to the changing financial service demands of its clientele, CamCCUL intends to open its own Union Bank.

The Grameen Bank in Bangladesh is one of the most successful rural credit programs in the world for sustainability and poverty alleviation. As a development bank focused on the poor, it not only emphasizes poverty alleviation, but also institutional viability (Berger 1989; Hulme 1990; McKee 1989).

The potential of group lending for the long-term success of financial intermediaries becomes evident when one looks at the examples of the Grameen Bank, Bina Swadaya,¹⁷ BRAC, and SEWA (Table 15). Group lending can reduce the transaction costs of institutions that specialize in lending to the poor. The institution administers group loans instead of individual loans. In Bina Swadaya, for example, each group on-lends to 50 individuals. However, it is important to note that all of the programs listed in Table 15 depend on subsidies for institution building and expansion of program outreach. Recurrent expenditures to ensure the operation of the financial institution should, however, not be subsidized.

¹⁶Loans are considered delinquent if they are overdue more than two months.

¹⁷Bina Swadaya in Indonesia is a Community Self-Reliance Development Agency that dates back to 1958. The agency extends group loans that are secured by savings that cannot be withdrawn until the loan is repaid. From 1990 to 1992, about 19.5 percent of the loans granted were secured by blocked savings. This gives a savings-to-credit ratio ranging from 1.00 to 5.17 (Haryadi 1992).

Essentials for Effective Program Design

The previous assessment of financial innovations and institutions with a food security perspective demonstrated that there exist common characteristics and key features among them. *Savings arrangements* are the most prominent trait of sustainable financial programs for the poor. All programs include either voluntary or mandatory savings schemes, or both. In mobilizing savings, however, programs need to take into account the precautionary motive by offering savings schemes that are liquid. Savings may sometimes follow, rather than precede, lending activities, as is the case in the Caisses Villageoises d'Epargne et de Cr dit de Banh, Burkina Faso.

Group approaches undoubtedly have potential for deepening the financial market. They have proven promising in reaching small-scale savers and borrowers, they are suitable for opening markets for women, and they keep the financial intermediaries' cost of operation low. It seems, however, that financial intermediation alone is not a sufficient bond for holding such groups together (Slover 1992). More research is needed on the driving factors behind long-lasting group relationships and the role that financial activities play.¹⁸ Further study of group structures and group benefits in the informal financial market could improve knowledge about necessary conditions for successful group savings and lending programs.

Demand-oriented financial services are essential for wide outreach. In lending to rural households, coverage of the target clientele requires that the scope of services rendered has to include not only production- and income-generating activities, but also consumption needs such as health, education, and social obligations. Innovative rural financial institutions also must respond to emergency situations that may make timely loan repayment impossible. This may require unbureaucratic access to emergency loans, to rescheduling of loans, or to a buildup of *insurance funds* by member-based financial institutions, which are then controlled by the member-based institution at the community level or pooled through a second-tier institution.

Sustainability is the most essential element of financial market development. Financial institutions that provide savings services and cover variable costs of lending through appropriate interest margins are most successful in securing sustainability. Group formation and cooperation with local SHGs and NGOs can effectively support the

¹⁸One example demonstrates the complexity of factors behind group formation. In the North-West of Cameroon (Wvem), a rotating savings and credit group has been in existence since about 1917. Its members belong to the same extended family. They believe that whenever the group's functioning is interrupted, this is a bad omen for its members.

building of a broad rural client base, promote resource mobilization, and help in keeping transaction costs low. Liberalization of financial markets and macroeconomic stability and predictability are, of course, crucial for institutional sustainability. Sustained financial service supply is essential for the clientele to allow for longer-term investment planning, regardless of whether the client intends to finance his needs through his own savings or by going into debt.

The Grameen Bank's success in alleviating poverty has attracted broad attention in the field of rural finance. The question, however, is whether the Grameen Bank model can be replicated elsewhere. Differing opinions exist: Hossain (1988) states that the bank's approach can be fairly well replicated in many parts of Asia. But Africa's distinct socioeconomic conditions require considerable experimentation to determine appropriate financial intermediaries. Nevertheless, the Grameen Bank may be used as an initial model for action research (Hulme 1990). Fugelsang and Chandler (1986) in their Grameen Bank review for Norway's Ministry of Development Cooperation explicitly caution against transferring the Grameen Bank concept into other socioeconomic environments. They favor the idea of taking specific elements of the Bank's approach and adopting them as appropriate to other environments.

This leads to yet another, and probably the most important, essential feature of financial market development—that is, not to merely replicate successful financial institutions but to adapt them to local circumstances or to design new institutions appropriate to local conditions. Such adaptation appears to be most successfully achieved through participatory processes that enable potential clients to influence the structure, contractual terms, and services provided by the member-based institution. Public support is required to promote institutional innovations adapted to local environments on a large scale.

5

Conclusions for Research and Policy

Promoting innovations and institution building in financial markets for the poor must be an integral component of development policy. Given the highly fluctuating incomes of rural households and incomplete insurance markets in developing countries, access to credit, savings, and insurance services can help generate income and stabilize consumption, thereby addressing both the short- and long-term food-security problems of the poor. In this report, the potentials for improved food security and economic growth have been explored. Based on a conceptual framework and a review of theory, empirical evidence on borrowing and savings behavior, and experiences with innovative institutions, the following conclusions for policy and program design and for future directions of research are drawn.

Toward Food Security: A Broader Role for Rural Finance

It is widely recognized that providing credit targeted to production alone is a futile exercise because of the fungibility of resources at the household level. This is not the only argument against attempting to closely supervise credit for a particular use, however, whether for production or consumption. Although households have a strong demand for financial services for intertemporal adjustments of consumption and for mitigation of consumption and production risks, the household's willingness to pay for such services is not often addressed by traditional credit programs.

An investigation of the potential functions of the financial market indicates that provision of financial services plays a broader role in food security than it is usually assigned. The conceptual framework at the household level distinguished three pathways through which access to credit, savings, and insurance services can improve transitory and

chronic food security. First, credit or savings can be used to provide capital for financing inputs, labor, and equipment for income generation. Second, access to credit and insurance services can increase the capacity to bear risks so that households can invest in new, more risky but also more profitable activities instead of holding liquid asset portfolios as precautionary savings against future shortfalls. Third, financial services can help to stabilize consumption of food and other essential goods during the period just before the next harvest and other times of hardship. Which pathway is most important and which type of financial service is most in demand depends on the socioeconomic characteristics of the household.

Based on this framework, financial services for enhancing household food security not only implies provision of credit for agricultural production or off-farm microenterprises, but also of credit and savings services that respond to the demand for precautionary savings and consumption smoothing, as well as the provision of savings options with different maturities, risks, and interest rates for more efficient asset portfolios and capital accumulation. This broader role of rural financial policy also emphasizes the potential of insurance services that can be provided by member-owned and member-controlled institutions, at least for covering idiosyncratic risks.

The need for expanding the conventional savings concept also must be emphasized. In financial terms, savings are defined as the net change in equity between periods. This definition includes the change in monetary and nonmonetary assets, such as land and livestock, and adjustments to changes in debt. If the focus is on food security, this definition of the household's savings is too narrow. In many rural developing economies, labor is the most important factor of production of food-insecure households. Therefore, the definition of household savings must be expanded to include investments in human capital, such as the number of children and the education and nutritional status of family members. This expansion of the concept of savings may also contribute to a rationalization of credit used for consumption of basic goods, which is still a controversial issue among bankers and economists alike.

Formal savings products should not, by default, emphasize the interest rate as the main product characteristic, but should also stress liquidity, security, and saver's transaction costs. These latter criteria appear to be especially relevant for the food insecure in many socioeconomic contexts of developing countries. The empirical evidence so far obtained does not support the view that the elasticity of savings with respect to interest rates is high. Moreover, intertemporal theory yields an ambiguous relationship. The poorer and more food-insecure the household, the more emphasis appears to be placed on liquidity and transaction costs rather than on the interest rate of the savings deposit.

Most informal loans are used for consumption: the poorer the household, the higher the percentage of consumptive use. This pattern

indicates that formal institutions could place greater emphasis on consumption credit if cost-effective arrangements for providing such loans could be found. Recent research shows that access to financial markets can play a beneficial role in improving food consumption, nutritional status, and education.

More research on savings behavior of food-insecure households is required to identify the determinants of household decisionmaking regarding investments in human capital and physical capital. The analysis of long-term savings and investment behavior is a particularly important item on the research agenda for sustaining natural resources, for increasing agricultural productivity, and for alleviating poverty. Efforts should also be intensified to quantify the economic and social benefits and costs of savings, credit, and insurance services for the rural poor in terms of additional income and increased food security. In addition, the scope, benefits, and costs of targeting financial services to specific household members, such as women, should be analyzed. Such research could contribute to a broader understanding of the potentials and limitations of rural finance for enhancing household and intra-household food security.

Providing Financial Services to the Poor: The Role of the Public Sector

There are, however, significant constraints to broadening the role of rural financial services for the poor, such as information asymmetries that cause problems of moral hazard and adverse selection, which in turn lead to high unit transaction costs, covariate risks, and lack of collateral. Informal institutional arrangements, such as reciprocal gift and loan exchange systems with state-contingent contracts, and interlinked contracts successfully circumvent some of these constraints. Much remains to be learned from these systems, not only for rural financial markets but also for social safety net design.

Low unit transaction costs are necessary to provide financial services to the poor. Reducing the transaction costs of banking for the poor and charging cost-recovering interest rates and fees are necessary for the financial intermediary to survive. Too many credit projects and pilot programs are only temporary phenomena. As soon as clients question the long-term viability of a financial institution, loan defaults escalate because the expected net present value of future access to loans and other services from the unstable institution vanishes.

Few successful finance schemes have managed to stay in this difficult market segment. Most depend on at least a modest level of public subsidies. If, by providing financial services to the poor, rural financial

institutions ameliorate food insecurity, they are assuming a task of the public sector. Therefore, public subsidies may be justified if such subsidies can be phased out after the initial stage or kept at a modest level comparable to their perceived welfare benefits for the poorest segments of the population. Such subsidies could be used for initial phases of institution building, for technical assistance, and for pilot-program experimentation. However, subsidies should, in general, not be used for reducing loan interest rates below market level, as is the case in many rural credit programs. The interest rates must be high enough to cover the opportunity cost of capital and the long-run average transaction costs for mobilizing and lending funds that are expected once the institution is well established.

From a policy perspective, public support for building rural financial institutions ought not—in principle—to be judged on the prospect of achieving financial sustainability for the financial institution, but on the economic sustainability of the public investment. Based on the criteria of economic sustainability of policies, a public investment with high social returns, such as primary education, may well justify continued long-term support even though it is not financially self-sustaining. Policymakers must allocate public funds among competing investments so that social returns are maximized. In many rural areas of developing countries, long-term support for building and maintenance of rural financial institutions that serve the poor has higher benefit-cost ratios in the short and long run than competing policy instruments. Thus, public investment in building financial institutions can be economically sustainable, although the institutions themselves depend on subsidies and cannot fully sustain themselves financially.

Institutional innovation and building is a long-term effort, as the examples of the Raiffeissen cooperatives and the Grameen Bank show. Hence, public support should also be long term. There is no justification for credit projects of a short duration because in their final year of publicly driven existence, they end up with widespread loan default. They eventually become income transfer programs with detrimental effects on rural financial markets and with poor cost-benefit ratios.

The concept of cost-benefit evaluation of public investments in rural financial institutions, however, has so far not been applied. This is probably because of the dearth of quantitative assessments regarding the welfare benefits of improved access to financial services for rural households. As a result of this lack of information on benefits, pragmatic and cautious decision rules for public policy, such as support limited to institutional innovation and the initial phase of formation, continue to be needed and appropriate.

Key factors for success of the institutions reviewed here are (1) the financial products effectively respond to the diverse demands for savings and credit options, while stressing the poor's demands for savings and insurance services; (2) locally adapted collateral substitutes such as

peer pressure, obligatory savings, or character references are used, thus reducing transaction costs for screening, loan disbursement, and repayment, including the risk of loan default; (3) market-based savings and credit interest rates are in effect to attract savings deposits, to cover administrative and capital costs, and to avoid rent-seeking of better-off groups; and (4) flexibility in decisionmaking and incentives for compliance at the grassroots level are incorporated into the program.

These common traits do not imply that their application will be successful in every socioeconomic and agroecological environment. When identifying suitable institutional arrangements among financial intermediaries, borrowers, and savers, the functioning of the indigenous financial market arrangements should be considered, as well as the existing physical infrastructure, human capital, and socioeconomic risks of potential clients. Further comparative research on institutional arrangements in different socioeconomic and agroecological settings is needed for a better understanding of which institutional arrangements are best suited for specific environments. Learning from informal institutions and indigenous social security systems at the community level is especially fruitful for successfully adapting formal institutional arrangements to different environments.

Macroeconomic Policies and Rural Finance for the Poor

Economic policies and institutions set the framework for financial market development. Competitive market principles, macroeconomic stability, liberalization of financial sector policies, and a reliable and enforceable legal and regulatory framework are key requirements of successful financial market development.

Many developing countries in the last decade have had to adjust their economies to a changing external and internal environment. Within the framework of structural adjustment programs, policies have focused on improving key requirements of financial market development. Thus, in programs of macroeconomic reform, reducing inflation through monetary and fiscal policies has been a high priority. The neo-classical view that financial market liberalization alone will lead to the formation of rural financial institutions that serve the poor has been seriously questioned in recent theoretical and empirical work. Because of the imperfections in intertemporal markets, institutional innovation and formation may not be born out of market forces alone. The existing regulatory framework for the financial sector in many developing countries is often meant for the formal banking sector and continues to repress differentiation and sustainability of member-based financial institutions at the community level.

While a substantial body of research has been carried out to trace the effects of various macroeconomic policy changes on the poor, there is a need for more research on how structural adjustment programs affect formal and informal financial markets and the services they provide for the rural poor. Questions about the way that macroeconomic and financial sector reforms affect credit demand, savings, institutions' and clients' transaction costs, exposure of the poor to risks, self-help group formation, and informal sector activities are of particular importance.

Synergetic Cooperation Between Informal and Formal Finance

By and large, the formal banking sector in developing countries traditionally sees its functions as the allocation of "investment and production loans" and, to a lesser extent, savings mobilization. It mostly neglects the functions of consumption credit, precautionary savings, insurance, and risk-pooling, which are so important in rural societies, especially for the rural poor facing transitory food insecurity.

This review of research on informal financial arrangements has shown that informal finance provides important savings, credit, insurance, and social security services to the poor. Weaknesses, on the other side, appear to be (1) the lack of medium- and long-term loans for production and technology adoption and (2) the lack of monetary savings options with real returns. Moreover, informal arrangements are often restricted to the community or district levels, and therefore may be seriously limited in their ability to pool covariate risks across regions and to mobilize capital and allocate it to different regions and economic sectors.

An important research issue is to quantify the private and social costs and benefits of informal systems and compare them with those for public investments in rural financial markets. Research could then identify those services that could potentially be provided by the formal sector to increase welfare and the services for which the formal sector has proven inefficient.

Many successful formal institutions build on some of the principles of informal finance by exploiting locally available information, by pooling risks, and by using social capital through a linkage of third-tier member-based institutions with the formal financial sector. Building on informal arrangements such as informal savings and credit groups, but also complementing and reinforcing them in their functions by linking informal and formal institutions seems to be a promising strategy. More research is needed on the effects of program design and exogenous characteristics at the community and household levels on the formation, structure, conduct, and performance of grassroots institutions, including participatory action-research pilot programs. Such research is necessary to identify sustainable approaches suitable for

financial market development in rural areas, in particular for revamping agricultural credit services to small farmers.

The most promising of recent strategies for financial market development appears to be the linkage of member-controlled financial institutions with a liberalized banking and cooperative sector. Based on a review of selected, heterogeneous rural financial institutions in developing countries, various alternatives to the top-down-oriented approach of rural credit programs include (1) member-controlled savings and credit cooperatives, such as are found in Cameroon, which transact not only with their members but also with informal credit and savings associations; (2) informal savings clubs in Zimbabwe, which deposit savings with the banking sector; (3) village banks such as those found in The Gambia, Madagascar, Mali, and many other developing countries, which have the autonomy to set their own savings and loan interest rates for internal funds or for on-lending of formal loans; (4) community-based, often indigenous self-help groups, which act as the final institution for the mobilization and allocation of capital in Indonesia; and (5) the well-known, group-based rural banking institutions the Grameen Bank and BRAC in Bangladesh. The regulatory framework for the financial sector, however, must allow for flexibility in enabling member-based institutions, such as networks of self-help groups, village banks, and cooperatives, to adapt the financial services and contractual terms to the local supply and demand patterns.

A consensus has emerged in recent years that public action is called for to initiate required institutional innovation and development in rural financial markets that are accessible to the poor. Institutional innovation can be induced by public investments for researching and experimenting with alternative financial services and contractual arrangements. Future research analyzing the welfare effects of rural banking for the poor may not only contribute to the rationalization of public investment in rural financial institutions for the poor, but it may also identify its limitations for promoting agricultural and rural growth and employment, improving household food security, and alleviating poverty.

References

- Adams, D. W. 1984. *Do rural financial savings matter?* Columbus, Ohio, U.S.A.: Department of Agricultural Economics and Rural Sociology, Ohio State University.
- . 1988. The conundrum of successful credit projects in floundering rural financial markets. *Economic Development and Cultural Change* 36 (2): 355–367.
- . 1992. Taking a fresh look at informal finance. In *Informal finance in low-income countries*, ed. D. W. Adams and D. A. Fitchett. Boulder, Colo., U.S.A.: Westview Press.
- . 1995. From agricultural credit to rural finance. *Quarterly Journal of International Agriculture* 34 (2): 109–120.
- Adams, D. W., and M. L. Canavesi de Sahonero. 1987. Rotating savings and credit associations in Bolivia. Department of Agricultural Economics and Rural Sociology, Ohio State University, Columbus, Ohio, U.S.A. Mimeo.
- Adams, D. W., and J. R. Ladman. 1979. Lending to rural poor through informal groups: A promising financial innovation? *Savings and Development* 2 (3): 85–94.
- Adams, D. W., and A. A. P. Romero. 1981. Group lending to the rural poor in the Dominican Republic: A stunted innovation. *Canadian Journal of Agricultural Economics* 29 (2): 217–224.
- Adams, D. W., and R. C. Vogel. 1985. Rural financial markets in low-income countries: Recent controversies and lessons. *World Development* 14 (4): 477–487.
- Adams, D. W., D. H. Graham, and J. D. von Pischke, eds. 1984. *Undermining rural development with cheap credit*. Boulder, Colo., U.S.A.: Westview Press.
- Alam, A. 1992. Going to poor people and going to scale. Paper presented at the Seminar on Financial Landscapes Reconstructed at Wageningen, The Netherlands, 17–19 November.

- Alderman, H., and C. H. Paxson. 1992. *Do the poor insure? A synthesis of the literature on risk and consumption in developing countries*. Discussion Paper No. 169. Princeton, N.J., U.S.A.: Woodrow Wilson School of Public and International Affairs, Princeton University.
- Aleem, I. 1990. Imperfect information, screening, and the costs of informal lending: A study of the rural credit market in Pakistan. *World Bank Economic Review* 4 (3): 329-349.
- Alter, G. 1990. *Interest rate liberalization: A review of some country experience*. Washington, D.C.: World Bank.
- Appelbaum, E., and E. Katz. 1991. The demand for children in the absence of capital and risk markets: A portfolio approach. *Oxford Economic Papers* 43 (2): 292-304.
- Araujo, P. 1967. An economic study of factors affecting the demand for agricultural credit at the farm level. Master's thesis, Ohio State University, Columbus, Ohio, U.S.A.
- Ardener, S. 1964. Rotating credit associations in India. *Journal of the Royal Anthropological Institute* 94 (July): 201-229.
- Bardhan, P. 1980. Interlocking factor markets and agrarian development: A review of issues. *Oxford Economic Papers* 32 (1): 82-98.
- . 1989. A note on interlinked rural economic arrangements. In *The economic theory of agrarian institutions*, ed. P. Bardhan. Oxford: Clarendon Press.
- . 1993. Analytics of the institutions of informal cooperation in rural development. *World Development* 21 (4): 633-639.
- Basu, K. 1983. The emergence of isolation and interlinkage in rural markets. *Oxford Economics Paper* 35 (2): 262-280.
- Bechtel, H. 1988. *Institutional and operational problems and constraints in external finance of informal savings and credit rings*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- Becker, W. S. 1970. Agricultural credit and Colombia's economic development. Ph.D. diss., Louisiana State University, Baton Rouge, La., U.S.A.
- Bédard, G. 1991. *Banking de développement au service des pauvres—un nouveau paradigme bancaire*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- Bell, C. 1988. Credit markets and interlinked transactions. In *Handbook of development economics*, ed. H. Chenery and T. N. Srinivasan. Amsterdam: Elsevier.

- Bell, C., T. N. Srinivasan, and C. Udry. 1990. Segmentation, rationing, and spillover in credit markets: The case of rural Punjab. Vanderbilt University, Nashville, Tenn., and Yale University, New Haven, Conn., U.S.A. Mimeo.
- Berger, M. 1989. Giving women credit: The strengths and limitations of credit as a tool for alleviating poverty. *World Development* 17 (7): 1017–1032.
- Besley, T. 1992. Savings, credit, and insurance. Draft working paper. Princeton University, Princeton, N.J., U.S.A.
- Besley, T., and S. Coate. 1993. The economics of rotating savings and credit associations. *American Economic Review* 82 (1): 792–810.
- . 1995. Group lending, repayment incentives, and social collateral. *Journal of Development Economics* 46 (1): 1–18.
- Besley, T., and A. R. Levenson. 1996. The role of informal finance in household capital accumulation: Evidence from Taiwan. *The Economic Journal* 106 (1): 39–59.
- Bhaduri, A. 1977. On the formation of usurious interest rates in backward agriculture. *Cambridge Journal of Economics* 1 (4): 341–352.
- Bhatt, V. V. 1988. On financial innovations and credit market evolution. *World Development* 16 (2): 281–292.
- Binkowski, P., and H. Beek. 1989. *Finanzinnovationen. Reihe Wirtschaft—Finanzen—Innovationen*. Vol. 1. Bonn, Germany: Economica Verlag.
- Binswanger, H. P., and S. R. Khandker. 1993. *The impact of formal finance on the rural economy of India*. Working Paper Series No. 949, Agriculture and Rural Development Department. Washington, D.C.: World Bank.
- Binswanger, H. P., and M. Rosenzweig. 1986. Behavioral and material determinants of production relations in agriculture. *Journal of Development Economics* 22 (April): 504–539.
- Binswanger, H. P., and D. A. Sillers. 1983. Risk aversion and credit constraints in farmers' decisionmaking: A reinterpretation. *Journal of Development Studies* 20 (1): 5–21.
- Binswanger, H. P., J. McIntire, and C. Udry. 1989. Production relations in semi-arid African agriculture. In *The economic theory of agrarian institutions*, ed. P. Bardhan. Oxford: Clarendon Press.
- Blanchard, O., and S. Fischer. 1989. *Lectures on macroeconomics*. Cambridge, Mass., U.S.A.: Massachusetts Institute of Technology.

- Bomda, J., and G. Schrieder. 1995. Les Mutuelles Communautaire de Croissance (MC2) dans la province de l'ouest Cameroun. University of Hohenheim, Stuttgart, Germany. Mimeo.
- Bouman, F. J. A. 1977. Indigenous savings and credit societies in the Third World: A message. *Savings and Development* 1 (4): 181-209.
- . 1979. The ROSCA: Financialology of an informal savings and credit institution in developing economies. *Savings and Development* 3 (4): 253-276.
- . 1992. ROSCA and ASCRA: Beyond the financial landscape. Paper presented at the Seminar on Financial Landscapes Reconstructed at Wageningen, The Netherlands, 17-19 November.
- Bouman, F. J. A., and R. Bastiaansen. 1989. Pawnbroking as an attractive alternative to cheap credit: Cases from India and Sri Lanka. Paper presented at the Seminar on Informal Financial Markets in Development, Washington, D.C., 18-20 October.
- Bouman, F. J. A., and K. Hartefeld. 1976. The Djanggi, a traditional form of saving and credit in West Cameroon. *Sociologia Ruralis* 16: 78-96.
- BRAC (Bangladesh Rural Advancement Committee). 1991. *Annual report*. Dhaka, Bangladesh.
- . 1992. *Annual report*. Dhaka, Bangladesh.
- Bratton, M. 1986. Financing smallholder production: A comparison of individual and group credit schemes in Zimbabwe. *Public Administration and Development* 6 (2): 115-132.
- Braun, J. von. 1989. Credit for the rural poor in Sub-Saharan Africa. A research proposal submitted to the Bundesministerium für Wirtschaftliche Zusammenarbeit, Bonn, Germany. Washington, D.C.: International Food Policy Research Institute.
- . 1991a. *A policy agenda for famine prevention in Africa*. Food Policy Statement 13. Washington, D.C.: International Food Policy Research Institute.
- . 1991b. Social security in Sub-Saharan Africa: Reflections on policy changes. In *Social security in developing countries*, ed. E. Ahmad, J. Drèze, J. Hills, and A. Sen. Oxford: Oxford University Press.
- Braun, J. von, and E. Kennedy. 1987. Cash crops versus subsistence crops: Income and nutritional effects in developing countries. In *Food policy. Integrating supply, distribution, and consumption*, eds. J. P. Gittinger, J. Leslie, and C. Hoisington. Baltimore, Md., U.S.A.: Johns Hopkins University Press.

- Braun, J. von, S. Malik, and M. Zeller. 1993. Credit markets, input support policies, and the poor: Insights from Africa and Asia. Paper presented at the 1993 American Agricultural Economics Association Pre-Conference on Post-Green Revolution Agricultural Development Strategies in the Third World: What Next?, Orlando, Fla., U.S.A.
- Braun, J. von, H. Bouis, S. Kumar, and R. Pandya-Lorch. 1992. *Improving food security of the poor: Concept, policy, and programs*. Washington, D.C.: International Food Policy Research Institute.
- Braun, J. von, K. John, S. Kinteh, D. Puetz, and P. Webb. 1990. Structural adjustment, agricultural development constraints, and welfare of the rural poor in The Gambia. Final Report to Gesellschaft für Technische Zusammenarbeit (GTZ). Washington, D.C.: International Food Policy Research Institute.
- Braverman, A., and J. L. Guasch. 1986. Rural credit markets and institutions in developing countries: Lessons for policy analysis from practice and modern theory. *World Development* 14 (10/11): 1253-1267.
- Broca, S. S. 1995. Credit constraints and their impact on risk-bearing and precautionary saving: A case study from rural Pakistan. Ph.D. diss., Johns Hopkins University, Baltimore, Md., U.S.A.
- Bürgel, H., G. Traut, and E. Hucke. 1990. *Förderung ländlicher Selbsthilfeorganisationen in Kamerun*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- Büschgen, H. E. 1986. Finanzinnovationen. Neuerungen und Entwicklungen an nationalen und internationalen Finanzmärkten. *Zeitschrift fuer Betriebswirtschaftslehre* 56 (4/5): 299-336.
- Burkett, P. 1988. *Informal finance in developing countries: Lessons for the development of financial intermediaries*. Coral Gables, Fla., U.S.A.: University of Miami.
- CamCCUL (Cameroon Cooperative Credit Union League). 1986. *Annual report*. Yaoundé.
- . 1988. *Credit union by-laws*. Yaoundé.
- . 1991. *Annual report*. Yaoundé.
- Caputo, V. 1989. Le crédit et l'épargne ruraux dans le Sahel. Paper presented at the Workshop about La Gestion des Terroirs Villageois au Sahel, Ségou, Mali, 22-27 May.
- Carroll, C. D. 1991. *Buffer stock saving and the permanent income hypothesis*. Washington, D.C.: Board of Governors of the Federal Reserve System.

- . 1994. How does future income affect current consumption? *Quarterly Journal of Economics* 109 (1): 111–147.
- CCEI-Bank (Caisse Commune d'Épargne de d'Investissement). 1992. *Mutuals of Cameroon communities—MC2: The farmers' driving force*. Yaoundé, Cameroon: CCEI-Bank.
- Chao-Beroff, R., R. Egger, and A. Moreno. 1991. *Épargne et crédit participatif*. Kreditanstalt für Wiederaufbau (KfW). Frankfurt am Main, Germany. Mimeo.
- Chew, S. T. 1987. *Credit programs for small farmers: A project manager's reference*. USAID Evaluation Special Study 47. Washington, D.C.: U.S. Agency for International Development.
- Chimedza, R. 1989. Zimbabwe's informal financial sector: An overview. Paper presented at the Seminar on Informal Financial Markets in Development, Ohio State University/USAID/World Bank, Washington, D.C., 18-20 October.
- Christen, R. P., E. Rhyne, R. C. Vogel, and C. McKean. 1995. *Maximizing the outreach of microenterprise finance: An analysis of successful microfinance programs*. U.S. Agency for International Development, Program and Operations Assessment Report No. 10, Washington, D.C.: USAID.
- Clarke, R. 1996. Equilibrium interest rates and financial liberalization in developing countries. *Journal of Development Studies* 33 (2): 391–413.
- CNMCCA (Confédération Nationale de la Mutualité, de la Coopération et du Crédit Agricoles). 1968. *Le mouvement mutualiste et coopératif agricole*. Paris.
- Coate, S., and M. Ravallion. 1993. Reciprocity without commitment. Characterization and performance of informal insurance arrangements. *Journal of Development Economics* 40 (1): 1–24.
- Colyer, D., and G. Jimenez. 1971. Supervised credit as a tool in agricultural development. *American Journal of Agricultural Economics* 53 (4): 639–642.
- Cordova, D., G. Masicat, and R. W. Herdt. 1978. *Use of institutional farm credit in three locations of the Philippines, 1975–1977*. Manila: International Rice Research Institute.
- Cuevas, C. E. 1989. Togo. In *Rural finance profiles in African countries*, Vol. 2, ed. M. Masini. Milan: Finafrica-Cariplo.
- . 1996. Enabling environment and microfinance institutions: Lessons from Latin America. *Journal of International Development* 8 (2): 195–209.

- Cuevas, C. E., and D. H. Graham. 1988. *Development finance in rural Niger: Structural deficiencies and institutional performance*. Economics and Sociology Occasional Paper 1471. Columbus, Ohio, U.S.A.: Ohio State University.
- Czukas, K., M. Fafchamps, and C. Udry. 1995. Drought and saving in West Africa: Are livestock a buffer stock? Northwestern University, Evanston, Ill., and Stanford University, Stanford, Calif., U.S.A. Mimeo.
- Daines, S. R. 1975. *Guatemalan farm policy analysis: The impact of small farm credit on income, employment, and food production*. Analytical Working Document No. 10. Washington, D.C.: Bureau for Latin America, U.S. Agency for International Development.
- Dasgupta, P. 1993. *An inquiry into well-being and destitution*. Oxford: Clarendon Press.
- David, C., and W. Meyer. 1978. Measuring the farm-level impact of agricultural loans in low-income countries: A review article. Ohio State University, Columbus, Ohio, U.S.A. Mimeo.
- Deaton, A. 1991a. *Household savings in LDCs: Credit markets, insurance, and welfare*. Discussion Paper 153. Research Program in Development Studies. Princeton, N.J., U.S.A.: Woodrow Wilson School of Public and International Affairs, Princeton University.
- . 1991b. Saving and liquidity constraints. *Econometrica* 59 (5): 1221–1248.
- . 1992. *Understanding consumption*. Oxford: Clarendon Press.
- Desai, B. M. 1980a. *Group lending experiences in reaching small farmers*. Economics and Sociology Occasional Paper 761. Columbus, Ohio, U.S.A.: The Ohio State University.
- . 1980b. *Rural financial market barriers and group lending innovation*. Economics and Sociology Occasional Paper 745. Columbus, Ohio, U.S.A.: The Ohio State University.
- . 1983. Group lending in rural areas. In *Rural financial markets in developing countries: Their use and abuse*, ed. J. D. von Pischke, D. W. Adams, and G. Donald. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
- Desai, B. M., and J. W. Mellor. 1993. *Institutional finance for agricultural development: An analytical survey of critical issues*. Food Policy Review 1. Washington, D.C.: International Food Policy Research Institute.
- Devereux, S., and M. Fische. 1993. An economic analysis of group-lending programs in developing countries. *Developing Economics* 31 (1): 102–121.

- Diaz-Alejandro, C. 1985. Good-bye financial repression, hello financial crash. *Journal of Development Economics* 19 (1/2): 1-24.
- Diop, M. 1990. Contribution à la Mise en Place d'un Nouveau Système de Crédit Rural: Banh-Burkina Faso. Mémoire de D.I.A.T. Ecole Supérieur d'Agronomie Tropicale.
- Donald, G. 1976. *Credit for small farmers in developing countries*. Boulder, Colo., U.S.A.: Westview Press.
- Dornbusch, R., and A. Reynoso. 1989. Financial factors in economic development. *American Economic Review* 79 (2): 204-209.
- Eilenberger, G. 1991. Finanzinnovationen. *Das Wirtschaftsstudium* (11): 811-813.
- Elsäßer, K., and M. Diop. 1990. La banque experimentale de Banh: Une demarche de recherche-développement sur le crédit rural sahelien. Montpellier, France: Centre de coopération internationale en recherche agronomique pour le développement (CIRAD).
- Engel, J. F., R. D. Blackwell, and P. W. Miniard. 1993. *Consumer behavior*. 17th ed. Fort Worth, Tex., U.S.A.: Dryden Press.
- Engen, E. M., and W. Gale. 1991. IRAs and saving in a stochastic life-cycle model. University of California at Los Angeles, Los Angeles, Calif., U.S.A. Mimeo.
- Esguerra, E. F., and R. L. Meyer. 1992. Collateral substitutes in rural informal financial markets in the Philippines. In *Informal finance in low-income countries*, ed. D. W. Adams and D. A. Fitchett. Boulder, Colo., U.S.A.: Westview Press.
- Eswaran, M., and A. Kotwal. 1990. *Implications of credit constraints for risk behavior in less-developed countries*. Oxford Economic Papers 42. Oxford: Oxford University Press.
- Evenson, R. E. 1978. Time allocation in rural Philippine households. *American Journal of Agricultural Economics* 60 (2): 322-330.
- Feder, G., R. E. Just, and D. Zilberman. 1985. Adoption of agricultural innovations in developing countries. *Economic Development and Cultural Change* 33 (2): 255-296.
- Feder G., L. J. Lau, J. Y. Lin, and X. Luo. 1990. The relationship between credit and productivity in Chinese agriculture: A micro-economic model of disequilibrium. *American Journal of Agricultural Economics* 72 (5): 1151-1157.
- Foster, A. 1995. Prices, credit markets, and child growth in low-income areas. *Economic Journal* 105 (430): 551-570.

- Fox, R. H. 1953. A study of the energy expenditure of Africans engaged in various activities, with special reference to some environmental and physiological factors which may influence the efficiency of their work. Ph.D. diss., University of London, London.
- Franzen, Ch. 1988. Finanzinnovationen—was ist das? *Die Bank* (1): 18–20.
- Fry, M. 1988. *Money, interest, and banking in economic development*. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
- Fugelsang, A., and D. Chandler. 1986. Participation as process: What we can learn from the Grameen Bank, Bangladesh. Oslo: Norway, Ministry of Development Cooperation.
- Gadway, J. F. 1986. *The Cameroon credit union development project: 1986 baseline data survey*. Bamenda, Cameroon: Cameroon Cooperative Credit Union League.
- Geertz, C. 1962. The rotating credit association: A "middle rung" in development. *Economic Development and Cultural Change* 10 (April): 241–263.
- Germidis, D. 1990. Interlinking the formal and informal financial sectors in developing countries. *Savings and Development* 1.
- Gersovitz, M. 1988. Saving and development. In *Handbook of development economics*, Vol. 1., ed. H. Chenery and T. Srinivasan. Amsterdam: Elsevier.
- Gibson, H. D., and E. Tsakalotos. 1994. The scope and limits of financial liberalization in developing countries: A critical survey. *Journal of Development Studies* 30 (3): 578–628.
- Giovannini, A. 1983. The interest elasticity of savings in developing countries: The existing evidence. *World Development* 11 (7): 601–607.
- Gonzales Arrieta, G. M. 1988. Interest rates, savings, and growth in LDCs: An assessment of recent empirical research. *World Development* 16 (5): 589–605.
- Gonzalez-Vega, C. 1984. Credit-rationing behavior of agricultural lenders: The iron law of interest rate restrictions. In *Undermining rural development with cheap credit*, ed. D. W. Adams, D. H. Graham, and J. D. von Pischke. Boulder, Colo., U.S.A.: Westview Press.
- Graham, D. H. 1989. Informal rural finance in Niger: Lessons for building more efficient and sustainable formal institutions. Paper presented at the Seminar on Informal Financial Markets in Development, Washington, D.C., 18–20 October.

- Gurgand, M., G. Pederson, and J. Yaron. 1994. *Outreach and sustainability of six rural financial institutions in Sub-Saharan Africa*. Discussion Paper 248. Washington, D.C.: World Bank.
- Gyekye, A. B., E. T. Acquah, and C. D. Whyte. 1977. *An evaluation of institutional credit and its role in agricultural production in Ghana*. Petersburg, Va., U.S.A.: Bureau of Economic Research and Development, Virginia State University.
- Haddad, L., and M. Zeller. 1996. How can safety nets do more with less? General issues with some evidence from Southern Africa. Food Consumption and Nutrition Division Discussion Paper 16. International Food Policy Research Institute, Washington, D.C. Mimeo.
- Haddad, L., J. Hoddinott, and H. Alderman. 1997. *Intrahousehold resource allocation in developing countries: Models, methods, and policy*. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the International Food Policy Research Institute.
- Hall, R. 1978. Stochastic implications of the life-cycle permanent income hypothesis: Theory and evidence. *Journal of Political Economy* 86 (5): 971-987.
- Haryadi, E. 1992. Microenterprise development through SHGs and NGO intervention: A Bina Swadaya (self-reliance) model in promoting financial self-help groups. Paper presented at the Seminar on Financial Landscapes Reconstructed at Wageningen, The Netherlands, 17-19 November.
- Heckman, J., and J. Smith. 1995. Assessing the case for social experiments. *Journal of Economic Perspectives* 9 (2): 85-110.
- Heidhues, F. 1990. Ländliche Finanzinstitutionen und landwirtschaftliche Entwicklung—Eine Untersuchung in Benin. Paper presented at the Albert Ludwig Universität, Freiburg, Federal Republic of Germany, July.
- . 1992. Consumption credit in rural financial market development. Paper presented at the Seminar on Financial Landscapes Reconstructed at Wageningen, The Netherlands, 17-19 November.
- . 1995. Rural financial markets—An important tool to fight poverty. *Quarterly Journal of International Agriculture* 34 (2): 105-108.
- Heidhues, F., and G. Weinschenck. 1986. *Cameroon rural finance sector study*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- . 1990. Cameroon. In *Rural finance profiles in African countries*, Vol. 2, ed. M. Masini. Milan, Italy: Finafrica-Caprilo.

- Hoff, K., and J. E. Stiglitz. 1990. Introduction: Imperfect information and rural credit markets—Puzzles and policy perspectives. *World Bank Economic Review* 4 (3): 235–250.
- Hofmann, B. 1990. The rural households' financial requirements and formal and informal financial institutions analyzed in the Province Ouémé in the People's Republic of Benin. In *StandortgemäÙe Landwirtschaft in Westafrika*. Zwischenbericht 1988–90. Sonderforschungsbereich 308. Hohenheim, Federal Republic of Germany: Universität Hohenheim.
- Holt, S. L., and H. Ribe. 1991. *Developing financial institutions for the poor and reducing barriers to access for women*. World Bank Discussion Papers 117. Washington, D.C.: World Bank.
- Hossain, M. 1988. *Credit for alleviation of rural poverty: The Grameen Bank in Bangladesh*. Research Report 65. Washington, D.C.: International Food Policy Research Institute.
- Hulme, D. 1990. Can the Grameen Bank be replicated? Recent experiments in Malaysia, Malawi, and Sri Lanka. *Development Policy Review* 8 (3): 287–300.
- Huppi, M., and G. Feder. 1990. The role of groups and credit cooperatives in rural lending. *World Bank Research Observer* 5 (2): 187–204.
- IFAD (International Fund for Agricultural Development). 1988. *Credit for the rural poor: A review of IFAD's experience, 1978–1987*. Rome.
- Ikhide, S. 1993. Positive interest rates: Financial deepening and the mobilization of savings in Africa. *Development Policy Review* 11 (4): 367–382.
- Iqbal, F. 1986. The demand and supply of funds among agricultural households in India. In *Agricultural household models—Extensions, applications, and policy*, ed. I. Singh, L. Squire, and J. Strauss. Baltimore, Md., U.S.A., and London: Johns Hopkins University Press.
- Jacoby, H. 1994. Borrowing constraints and progress through school: Evidence from Peru. *Review of Economics and Statistics* 76 (1): 151–160.
- Jahangir, A. S. M., and M. Zeller. 1995. Overview paper on rural finance programs for the poor in Bangladesh—A review of five major programs. International Food Policy Research Institute, Washington, D.C. Mimeo.
- Jappelli, T. 1990. Who is credit-constrained in the U.S.? *Quarterly Journal of Economics* 105 (2): 219–234.

- Jayarajah, C., and W. Branson. 1995. *Structural and sectoral adjustment: World Bank experience, 1980-92*. A World Bank Operations Evaluation Study. Washington, D.C.: World Bank.
- Jung, K. H. 1987. Sparverhalten von Landwirten in Kamerun [Savings conduct of farmers in Cameroon]. *Entwicklung und ländlicher Raum* 27 (3): 85-97.
- Kabeer, N. 1992. Beyond the threshold: Intra-household relations and policy perspectives. Paper presented at the International Food Policy Research Institute/World Bank Conference on Intra-household Resource Allocation: Policy Issues and Research Methods, February, Washington, D.C.
- Kabore, N. 1990. Le financement de l'agriculture Burkinabé: L'expérience de la CNCA-B. Paper presented at the Seminar on Rural Financial Policies in Francophone Africa, Ouagadougou, Burkina Faso, 21-26 May.
- Khatkhate, D. R. 1988. Assessing the impact of interest rates in less developed countries. *World Development* 16 (5): 577-589.
- Kimball, M. S. 1990. Precautionary savings in the small and in the large. *Econometrica* 58 (1): 53-73.
- Kochar, A. 1994. An empirical investigation of rationing constraints in rural credit markets in India. Department of Economics, Stanford University, Stanford, Calif., U.S.A. Mimeo.
- . 1995. Labor market responses to idiosyncratic agricultural shocks: Empirical evidence from rural India. Department of Economics, Stanford University, Stanford, Calif., U.S.A. Mimeo.
- Koskela, E., and M. Viren. 1984. *Credit rationing and consumer intertemporal choice*. Oxford Economic Papers 36. Oxford: Oxford University Press.
- Kotwal, A. 1985. The role of consumption credit in agricultural tenancy. *Journal of Development Economics* 18 (2/3): 273-295.
- Krahn, J. P., and R. H. Schmidt. 1994. *Development finance as institution building: A new approach to poverty-oriented banking*. Boulder, Colo., U.S.A.: Westview Press.
- Kropp, E. 1988. *Banking for the poor: A dialogue and cooperation process involving banks and nongovernmental organizations*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- . 1990. *Development banking for the benefit of the poor. Subsystem 3: Linking banks and self-help groups in Indonesia*. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit.

- . 1995. Promoting poverty-oriented banking innovations in financial markets through technical cooperation—Experience from technical cooperation projects. *Quarterly Journal of International Agriculture* 34 (2): 195–206.
- Kumar, S. 1987. The nutritional situation and its food policy links. In *Accelerating food production in Sub-Saharan Africa*, ed. J. Mellor, C. Delgado, and M. J. Blackie. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the International Food Policy Research Institute.
- Lanjouw, P., and M. Ravallion. 1995. Poverty and household size. *Economic Journal* 105 (November): 1415–1434.
- Le Breton, P. 1991. *Projet Association d'Épargne et de Crédit Autogérée. Rapport Trimestriel pour Kreditanstalt für Wiederaufbau (KfW)*. Frankfurt.
- Lee, W. F., M. D. Boehlje, A. G. Nelson, and W. G. Murray. 1980. *Agricultural finance*, 7th ed. Ames, Iowa, U.S.A.: Iowa State University Press.
- Lieberson, J. M., K. A. Kotellos, and G. G. Miller. 1985. *A synthesis of AID experience: Small-farmer credit, 1973–1985*. AID Special Study No. 41. Washington, D.C.: U.S. Agency for International Development.
- Lund, S. M. 1995. Informal credit, insurance networks, and risk-sharing: Empirical evidence from the Philippines. Food Research Institute, Stanford University, Calif., U.S.A. Mimeo.
- Lycette, M., and K. White. 1989. Improving women's access to credit in Latin America and the Caribbean: Policy and project recommendations. In *Women's ventures: Assistance to the informal sector in Latin America*, ed. M. Berger and M. Buvinic. West Hartford, Conn., U.S.A.: Kumarian Press.
- Mauri, A. 1983. A policy to mobilize rural savings in developing countries. In *Rural financial markets in developing countries: Their use and abuse*, ed. J. D. von Pischke, D. W. Adams, and G. Donald. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
- McCarthy, J. 1992. *An empirical investigation of imperfect insurance and precautionary savings against idiosyncratic shocks*. Research Paper No. 9219. New York: Federal Reserve Bank of New York.
- McKee, K. 1989. Microlevel strategies for supporting livelihoods, employment, and income generation of poor women in the Third World: The challenge of significance. *World Development* 17 (7): 993–1006.

- McKinnon, R. 1973. *Money and capital in economic development*. Washington, D.C.: The Brookings Institution.
- McKinnon, R. I. 1986. Domestic interest rates and foreign capital flows in a liberalizing economy. Paper presented at the Annual Meeting of the American Economic Association, New Orleans, 28–30 December.
- . 1988. Financial liberalization in retrospect: Interest rate policies in LDCs. In *The state of development economics: Progress and perspectives*, ed. G. Ranis and T. P. Schultz. New York: Basil Blackwell.
- . 1989. Financial liberalization and economic development: A reassessment of interest rate policies in Asia and Latin America. *Oxford Review of Economic Policy* 5 (1): 29–54.
- Medellin-Erdmann, R. A., and E. Kropp. 1991. *New models for banking: Promotion of development banking services for the benefit of the poor*. Subsystem 4: Main report. Eschborn, Germany: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- Meyer, E. 1940. Kreditring in Kamerun. *Koloniale Rundschau* 1: 113–121.
- Meyer, R. L., G. Nagarajan, and D. H. Graham. 1995. Does membership homogeneity matter for group-based financial services? Evidence from The Gambia. Paper presented at the Annual Meetings of the American Agricultural Economics Association, Indianapolis, Ind., U.S.A., August.
- Meyer, R. L., and C. Gonzalez-Vega. 1986. Rural deposit mobilization in developing countries. *Entwicklung und ländlicher Raum* 20 (7): 9–11.
- Miracle, M. P., D. S. Miracle, and L. Cohen. 1980. Informal savings mobilization in Africa. *Economic Development and Cultural Change* 28 (4): 701–724.
- Mitra, P. 1983. A theory of interlinked rural transactions. *Journal of Public Economics* 20 (March): 167–191.
- Montiel, P. J., P. Agenor, and N. U. Haque. 1993. *Informal financial markets in developing countries*. Oxford: Blackwell.
- Morduch, J. 1990. Risk, production, and savings: Theory and evidence from Indian households. Harvard University, Cambridge, Mass., U.S.A. Mimeo.
- Mrak, M. 1989. Role of the informal financial sector in the mobilization and allocation of household savings: The case of Zambia. *Savings and Development* 1: 65–85.

- Nakajima, C. 1970. Subsistence and commercial farms: Some theoretical models of subjective equilibrium. In *Subsistence agriculture and economic development*, ed. C. R. Wharton. London: Cass.
- Nguyen, H. 1990. Programmes d'ajustement du secteur financier en Afrique Francophone: Une experience recente. Paper presented at the Seminar on Rural Financial Policies in West Africa. Ouagadougou, Burkina Faso, 21–26 May.
- Noponen, H. 1992. Targeted credit: Intrahousehold dynamics and female earnings—An event history approach. Paper presented at the International Food Policy Research Institute/World Bank Conference, Washington, D.C., February.
- Odedokun, M. O. 1996. International evidence on the effects of directed credit programmes on efficiency of resource allocation in developing countries: The case of development bank lendings. *Journal of Development Economics* 48 (2): 449–460.
- Oganda, W. 1989. Kenya: From a traditional to a cash economy. In *Banking the unbankable*. London: Panos Publications.
- Otero, M. 1986. Solidarity groups programs: A working methodology for enhancing the economic activities of women in the informal sector. Paper presented at the International Seminar in Quito, Ecuador, September.
- . 1989. *Solidarity group programs and their approach to evaluation*. Tegucigalpa, Honduras: ASEPARE and PACT.
- Otero, M., and J. Downing. 1989. Meeting women's financial needs: Lessons for formal financial institutions. Paper presented at the Seminar on Informal Financial Markets in Development, Ohio State University/USAID/World Bank, Washington, D.C., 18–20 October.
- Otsuka, K., H. Chuma, and Y. Hayami. 1992. Land and labor contracts in agrarian economies: Theories and facts. *Journal of Economic Literature* 30 (December): 1965–2018.
- Oyatoye, E. T. O. 1983. An economic appraisal of small farmers' credit schemes: A cost study of western Nigeria. *Savings and Development* 7 (3): 279–292.
- Paxson, C. 1992. Using weather variability to estimate the response of savings to transitory income in Thailand. *American Economic Review* 82 (1): 15–33.
- Payne, P. 1989. Public health and functional consequences of seasonal hunger and malnutrition. In *Seasonal variability in Third World agriculture: The consequences for food security*, ed. D. E. Sahn. Balti-

more, Md., U.S.A.: Johns Hopkins University Press for the International Food Policy Research Institute.

- Pinstrup-Andersen, P. 1993. Structural adjustment and the rural poor. Paper presented at the EAAE Seminar on Food and Agricultural Policies Under Structural Adjustment, University of Hohenheim, Hohenheim, Federal Republic of Germany, 21-25 September.
- Pitt, M. M., and S. R. Khandker. 1994. Household and intrahousehold impacts of the Grameen Bank and similar targeted credit programs in Bangladesh. Brown University, Providence, R.I., and World Bank, Washington, D.C. Mimeo.
- Platteau, J.-P. 1991. Traditional systems of social security and hunger insurance: Past achievement and modern challenges. In *Social security in Sub-Saharan Africa*, ed. E. Ahmad, J. Drèze, J. Hills, and A. Sen. Oxford: Oxford University Press.
- . 1992a. *Formalization and privatization of land rights in Sub-Saharan Africa: A critique of current orthodoxies and structural adjustment programmes*. Development Economics Research Programme Paper No. 34. London: London School of Economics.
- . 1992b. Credit as an insurance mechanism. Presentation given at the Seminar on Financial Landscapes Reconstructed at Wageningen, The Netherlands, 17-19 November.
- . 1995. The evolutionary theory of land rights as applied to Sub-Saharan Africa: A critical assessment. Research Series No. 145. Namur, Belgium: Department of Economic and Social Sciences, University Notre-Dame de la Paix.
- Platteau, J.-P., and A. Abraham. 1984. Credit as an insurance mechanism in the backward rural areas of less developed countries. *Savings and Development* 8 (2): 115-133.
- Putnam, R. D. 1993. The prosperous community: Social capital and public life. *American Prospect* 13 (1): 35-42.
- Radke, D., H. von Blankenburg, J. Gottschalk, J. Hake, S. Hartig, and K. Maurer. 1986. *Mobilization of personal savings in Zimbabwe through financial development*. Berlin: German Development Institute.
- Raiffeissen, F. W. 1866. *Die Darlehenskassenvereine als Mittel zur Abhilfe der Not der ländlichen Bevölkerung*. 8th ed. in English language (1970). Neuwied on the Rhine, Germany: Raiffeissen.
- Ram, R., and T. W. Schultz. 1979. Life span, health, savings, and productivity. *Economic Development and Cultural Change* 27 (3): 399-421.

- Robison, L. J., and P. J. Barry. 1987. *The competitive firm's response to risk*. New York: Macmillan.
- Robison, L. J., and A. A. Schmid. 1988. Interpersonal relationships and preferences: Evidence and implications. In *Handbook of behavioral economics*, Vol. 2B, ed. S. Kaish and B. Gilad. Greenwich, Conn., U.S.A.: JAI Press.
- Rosenzweig, M., and O. Stark. 1989. Consumption smoothing, migration, and marriage: Evidence from rural India. *Journal of Political Economy* 97 (4): 905-927.
- Rosenzweig, M., and K. I. Wolpin. 1993. Credit market constraints, consumption smoothing, and the accumulation of durable production assets in low-income countries: Investments in bullocks in India. *Journal of Political Economy* 101 (2): 223-224.
- Sahn, D. E., ed. 1989. *Seasonal variability in Third World agriculture: The consequences for food security*. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the International Food Policy Research Institute.
- Saleem, S. T. 1987. On the determination of interest rates in rural credit markets: A case study from the Sudan. *Cambridge Journal of Economics* 11 (2): 165-172.
- Schaefer-Kehnert, W., and J. D. von Pischke. 1982. Agrarkreditpolitik. In *Sozialökonomie der ländlichen Entwicklung*, ed. P. von Blanckenburg. Vol. 1. Handbuch der Landwirtschaft und Ernährung in den Entwicklungsländern. Stuttgart, Federal Republic of Germany: Verlag Eugen Ulmer.
- Schrieder, G. R. 1989. Informal financial groups in Cameroon: Motivation, organization, and linkages. Master's thesis, Ohio State University, Columbus, Ohio, U.S.A.
- . 1995. *The role of rural finance for food security of the poor in Cameroon*. Frankfurt, Germany: Lang Verlag.
- Schrieder, G. R., and C. Cuevas. 1992. Informal financial groups in Cameroon. In *Informal finance in low-income countries*, ed. D. W. Adams and D. A. Fitchett. Boulder, Colo., U.S.A.: Westview Press.
- Schrieder, G., and F. Heidhues. 1991. Analyzing rural households' needs for financial services: A methodological framework. In *Finance et développement rural en Afrique de l'Ouest*, ed. C. Cuevas and M. Benoit-Cattin. Montpellier, France: CIRAD-MES, 1994.
- . 1995. Reaching the poor through financial innovations. *Quarterly Journal of International Agriculture* 34 (2): 132-148.

- Scott, J. 1972. *The moral economy of the peasant*. New Haven, Conn., U.S.A., and London: Yale University Press.
- Seibel, H. D. 1985. Savings for development: A linkage model for formal and informal financial markets. *Quarterly Journal of International Agriculture* 24 (4): 390-398.
- Seibel, H. D., and M. T. Marx. 1987. *Dual financial markets in Africa*. Fort Lauderdale, Fla., U.S.A.: Verlag Breitenbach Publishers.
- Seibel, H. D., in collaboration with F. Bassele and P. Michell-Auli. 1994. *AFRACA linking banks and self-help groups in Africa—A sectoral project in cooperation with GTZ. A review*. Eschborn, Germany, and Nairobi, Kenya: Deutsche Gesellschaft für Technische Zusammenarbeit and African Rural and Agricultural Credit Association.
- Sharma, M., and M. Zeller. 1996. Repayment performance in group-based credit programs in Bangladesh: An empirical analysis. Food Consumption and Nutrition Division Discussion Paper 15. International Food Policy Research Institute, Washington, D.C. Mineo.
- Shaw, E. S. 1973. *Financial deepening in economic development*. New York: Oxford University Press.
- Shipton, P. 1990. *How Gambians save—And what their strategies imply for international aid*. Agricultural and Rural Development Department, Working Paper 395. Washington, D.C.: World Bank.
- Skully, M. 1992. Lending collateral problems and the pawnbroker solution: The development of the pawnshop industry in Asia. Paper presented at the Seminar on Financial Landscapes Reconstructed at Wageningen, Netherlands, 17–19 November.
- Slover, C. 1992. Informal financial groups in rural Zaire: A club theory approach. Ph.D. diss., Ohio State University, Columbus, Ohio, U.S.A.
- Smith, D. H., and K. Pillheimer. 1983. Self-help groups as social movement organizations: Social structure and social change. *Research in Social Movements, Conflicts, and Change* 5 (2): 203–233.
- Soen, D., and P. De Comarmond. 1972. Savings associations among the Bamiliké: Traditional and modern cooperation in southwest Cameroon. *American Anthropologist* 74: 1170–1179.
- Stiglitz, J. E. 1989a. Rational peasants, efficient institutions, and a theory of rural organization: Methodological remarks for development economics. In *The economic theory of agrarian institutions*, ed. P. Bardhan. Oxford: Clarendon Press.

- . 1989b. Financial markets and development. *Oxford Review of Economic Policy* 5 (4): 55–68.
- . 1990. Peer monitoring and credit markets. *World Bank Economic Review* 4 (4): 351–366.
- . 1992. *The role of the state in financial markets*. Working Paper Series 56. Washington, D.C.: Institute for Policy Reform.
- Stiglitz, J. E., and A. Weiss. 1981. Credit rationing in markets with imperfect information. *American Economic Review* 71 (June): 393–410.
- Teklu, T., J. von Braun, and E. A. A. Zaki. 1991. *Drought and famine relationships in Sudan: Policy implications*. Research Report 88. Washington, D.C.: International Food Policy Research Institute.
- Tendler, J. 1989. What happened to poverty alleviation? *World Development* 17 (7): 1033–1044.
- Thomas, D. 1994. Like father, like son: Like mother, like daughter: Parental resources and child height. *Journal of Human Resources* 29 (4): 950–988.
- Thomas, D., and C. L. Chen. 1994. *Income shares and shares of income: Empirical tests of models of household resource allocations*. Labor and Population Program Working Paper 94-08. Santa Monica, Calif., U.S.A.: The Rand Corporation.
- Townsend, R. 1989. Risk and insurance in village India. University of Chicago, Chicago. Mimeo.
- . 1995. Financial systems in northern Thai villages. *Quarterly Journal of Economics* 110 (4): 1011–1046.
- Udry, C. 1990. Credit markets in northern Nigeria: Credit as insurance in a rural economy. *World Bank Economic Review* 4 (4): 251–269.
- . 1995. Risk and saving in northern Nigeria. *American Economic Review* 85 (5): 1287–1300.
- Varian, H. R. 1990. Monitoring agents with other agents. *Zeitschrift für die gesamte Staatswissenschaft* [*Journal of Institutional and Theoretical Economics*] 146 (1): 153–174.
- Viganó, L. 1993. A credit scoring model for development banks: An African case study. *Savings and Development* 17 (4): 441–482.
- Villanueva, D., and A. Mirakhor. 1990. Strategies for financial reforms. *IMF Staff Papers* 37 (3): 509–536.
- Vogel, R. 1987. *Problèmes concernant les institutions financières*. EDI Working Document. Washington, D.C.: World Bank.

- von Pischke, J. D. 1983. A penny saved: Kenya's cooperative savings scheme. In *Rural financial markets in developing countries: Their use and abuse*, ed. J. D. von Pischke, D. W. Adams, and G. Donald. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
- . 1984. Rural financial markets in developing countries: Their use and abuse. In *Undermining rural development with cheap credit*, ed. D. W. Adams, D. H. Graham, and J. von Pischke. Boulder, Colo., U.S.A.: Westview Press.
- . 1988. Institutions, instruments, and transactions: What focus for financial development? Paper presented at the Seminar on the Potential for Financial Innovation in Small and Micro Enterprise Promotion, Washington, D.C.
- von Pischke, J. D., and D. W. Adams. 1980. Fungibility and the design and evaluation of agricultural credit programs. *American Journal of Agricultural Economics* 62 (4): 719–726.
- von Pischke, J. D., and J. Rouse. 1982. *Selected successful experiences in agricultural credit and rural finance in Africa*. AGRAP Division Paper 47. Washington, D.C.: World Bank.
- von Pischke, J. D., D. W. Adams, and G. Donald, eds. 1983. *Rural financial markets in developing countries: Their use and abuse*. Baltimore, Md., U.S.A.: Johns Hopkins University Press.
- von Stein, J. H. 1991. Finanzinnovationen. *Das Wirtschaftsstudium* 15 (1): 43–47.
- Wade, R. 1988. *Village republics: Economic conditions for collective action in South India*. Cambridge: Cambridge University Press.
- Warman, F., and A. P. Thirlwall. 1994. Interest rates, saving, investment, and growth in Mexico 1960–90: Tests of the financial liberalization hypothesis. *Journal of Development Studies* 30 (3): 629–649.
- Webb, P. 1989. *Intrahousehold decisionmaking and resource control: The effects of rice commercialization in West Africa*. Working Papers on Commercialization of Agriculture and Nutrition 3. Washington, D.C.: International Food Policy Research Institute.
- Wenner, M. W. 1995. Group credit: A means to improve information transfer and loan repayment performance. *Journal of Development Studies* 32 (2): 263–281.
- Wilk, R. R. 1989. Decisionmaking and resource flows within the household: Beyond the block box. In *The household economy*, ed. R. R. Wilk. Boulder, Colo., U.S.A.: Westview Press.
- Willis, R. J. 1980. The old age security hypothesis and population growth. In *Demographic behavior: Interdisciplinary perspectives on*

decision making, ed. T. K. Burch. Boulder, Colo., U.S.A.: Westview Press.

- WOCCU (World Council of Credit Unions). 1987. *Statistical report and directory*. Madison, Wis., U.S.A.
- . 1989. *Statistical report and directory*. Madison, Wis., U.S.A.
- . 1990. *News from the World Council of Credit Unions*. Madison, Wis., U.S.A.
- World Bank. 1989. *World development report 1989*. Oxford: Oxford University Press.
- . 1990a. *Financial systems and development*. Policy and Research Series 15. Washington, D.C.
- . 1990b. *World development report 1990*. Oxford: Oxford University Press.
- . 1991. *World Bank policies guiding financial sector operations*. Washington, D.C.
- . 1994. *OED Précis. 60*. Operations Evaluation Department. Washington, D.C.
- Yaron, J. 1992a. *Assessing development finance institutions*. Discussion Paper 174. Washington, D.C.: World Bank.
- . 1992b. *Successful rural finance institutions*. Discussion Paper 150. Washington, D.C.: World Bank.
- Zeldes, S. 1989. Consumption and liquidity constraints: An empirical investigation. *Journal of Political Economy* 97 (2): 305–346.
- Zeller, M. 1993. Credit for the rural poor: Country case Madagascar. Final report to the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). International Food Policy Research Institute, Washington, D.C. Mimeo.
- . 1994. Determinants of credit rationing: A study of informal lenders and formal groups in Madagascar. *World Development* 22 (12): 1895–1907.
- . 1995. The demand for financial services by rural households—Conceptual framework and empirical findings. *Quarterly Journal of International Agriculture* 34 (2): 149–170.
- . 1996. Determinants of repayment performance in credit groups: The role of program design, intra-group risk pooling, and social cohesion in Madagascar. Food Consumption and Nutrition Division Discussion Paper 13. International Food Policy Research Institute, Washington, D.C. Mimeo.

- Zeller, M., A. U. Ahmed, and M. Sharma. 1996. Credit for the rural poor: Country case Bangladesh. Final report to the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Washington, D.C.: International Food Policy Research Institute.
- Zeller, M., M. Sharma, and A. Ahmed. 1996. Group-based financial institutions for the rural poor in Bangladesh: An institutional- and household-level analysis. International Food Policy Research Institute, Washington, D.C. Mimeo.
- Zeller, M., J. von Braun, K. Johm, and D. Puetz. 1994. Sources and terms of credit for the rural poor in The Gambia. *African Review of Money, Finance, and Banking* (January): 167-186.
- Zeller, M., G. Schrieder, J. von Braun, and F. Heidhues. 1993. Credit for the rural poor in Sub-Saharan Africa. Final report to the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Washington, D.C.: International Food Policy Research Institute.
- Zeller, M., A. Ahmed, S. Babu, S. Broca, A. Diagne, and M. Sharma. 1996. Rural financial policies for food security of the poor: Methodologies for a multicountry research project. Food Consumption and Nutrition Division Discussion Paper 11. International Food Policy Research Institute, Washington, D.C. Mimeo.
- Zhu, L., Jiang Zhong Y., and J. von Braun. 1996. Credit for the rural poor in China. Final report to the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). International Food Policy Research Institute, Washington, D.C. Mimeo.

Manfred Zeller is a research fellow in the Food Consumption and Nutrition Division at the International Food Policy Research Institute. Franz Heidhues is a professor and Gertrud Schrieder is an associate professor at the University of Hohenheim, and Joachim von Braun is a professor at the University of Kiel.

The International Food Policy Research Institute was established in 1975 to identify and analyze alternative national and international strategies and policies for meeting food needs of the developing world on a sustainable basis, with particular emphasis on low-income countries and on the poorer groups in those countries. While the research effort is geared to the precise objective of contributing to the reduction of hunger and malnutrition, the factors involved are many and wide-ranging, requiring analysis of underlying processes and extending beyond a narrowly defined food sector. The Institute's research program reflects worldwide collaboration with governments and private and public institutions interested in increasing food production and improving the equity of its distribution. Research results are disseminated to policymakers, opinion formers, administrators, policy analysts, researchers, and others concerned with national and international food and agricultural policy.

IFPRI is a member of the Consultative Group on International Agricultural Research and receives support from the Arab Fund for Economic and Social Development, Argentina, the Asian Development Bank, Australia, Belgium, Canada, China, Denmark, the European Commission, the Ford Foundation, France, the German Agency for Technical Cooperation (GTZ), the German Federal Ministry for Economic Cooperation and Development (BMZ), India, the Inter-American Development Bank, the International Development Research Centre (Canada), the International Fund for Agricultural Development, Ireland, Japan, the Land and Agriculture Policy Centre (South Africa), Mozambique, the Netherlands, Norway, the Philippines, the Rockefeller Foundation, the Rural Industries Research and Development Corporation (Australia), South Africa, the Southern African Development Bank, Spain, Sweden, Switzerland, the United Kingdom, the United Nations Children's Fund, the United States, and the World Bank.

IFPRI FOOD POLICY REVIEWS

- 1 *INSTITUTIONAL FINANCE FOR AGRICULTURAL DEVELOPMENT: AN ANALYTICAL SURVEY OF CRITICAL ISSUES*, by Bhupat M. Desai and John W. Mellor, 1993
- 2 *HOW THIRD WORLD RURAL HOUSEHOLDS ADAPT TO DIETARY ENERGY STRESS: THE EVIDENCE AND THE ISSUES*, by Philip Payne and Michael Lipton, 1994
- 3 *FOODGRAIN PRICE STABILIZATION IN DEVELOPING COUNTRIES: ISSUES AND EXPERIENCES IN ASIA*, by Nurul Islam and Saji Thomas, 1996

IFPRI

1200 SEVENTEENTH STREET, N.W. • WASHINGTON, D.C. 20036-3006 • U.S.A.
1-202/862-5600 • FAX: 1-202/467-4439 • E-MAIL: ifpri@cgnet.com
WEB: www.cgiar.org/ifpri