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**Promises and Realities of Community-Based
Agricultural Extension**

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ABSTRACT

In view of the market failures and the state failures inherent in providing agricultural extension, community-based approaches, which involve farmers' groups, have gained increasing importance in recent years as a "third way" to provide this service. The paper discusses the conceptual underpinnings of community-based extension approaches, highlights theoretical and practical challenges inherent in their design, and assesses the evidence available so far on their performance. The paper reviews both quantitative and qualitative studies, focusing on three examples that contain important elements of community-based extension: the National Agricultural Advisory Services program of Uganda, the agricultural technology management agency model of India, and the farmer field school approach. The review finds that in the rather few cases where performance has been relatively carefully studied, elite capture was identified as a major constraint. Other challenges that empirical studies found include a limited availability of competent service providers, deep-seated cultural attitudes that prevent an effective empowerment of farmers, and difficulties in implementing farmers' control of service providers' contracts. The paper concludes that, just as for the state and the market, communities can also fail in extension delivery. Hence, the challenge for innovative approaches in agricultural extension is to identify systems that use the potential of the state, the market, and communities to create checks and balances to overcome the failures inherent in all of them.

Keywords: agricultural extension, community-based development

1. INTRODUCTION

Economists have often neglected the role of the community as a third pillar in the economic system next to the state and the market. Yet in agricultural development, which often is thwarted by both market and state failures, the “community mechanism” has a particular and promising role to play. It is one of Yujiro Hayami’s unique contributions to the economics literature that he developed “a conceptual framework for economists” that emphasizes the role of communities and shows how the contested concept of social capital can be applied to analyze communities from an economic perspective (Hayami 2009). At the same time, Hayami is not a “community romanticist”—he is well aware that, just as states and markets, communities can also fail to provide public goods efficiently and equitably.

Hayami’s insights on the community mechanism are particularly important for agricultural extension, which plays a leading role among the public services through which governments have traditionally sought to promote agricultural performance. Governments employ hundreds of thousands of public (or publicly paid) extension agents in developed and developing countries. International development agencies have provided in the past five decades several billions of dollars in programs to support and upgrade extension services in developing countries. Yet development scholars and practitioners have generally concluded that the performance of extension services in developing countries has been disappointing. A 2001 review sponsored by the Food and Agriculture Organization of the United Nations (FAO), for example, characterized extension services across the developing world as “failing,” “moribund,” and in “disarray or barely functioning at all” (Rivera, Qamar, and Crowder, 2001, 15).

Many agricultural development scholars attribute the inadequate performance of public extension to ineffective incentives for extension agents. In most public systems, agents are nominally accountable to their superiors (who may not be attentive to effective supervision) and are only indirectly (if at all) accountable to their farmer-clients. Moreover, the lack of information and feedback on different farmers’ groups’ needs and priorities hinders the design of relevant and effective extension programs (Anderson and Feder 2007).

In view of such realities, many extension scholars and development practitioners have focused on assessing the merits and feasibility of demand-driven approaches to extension (Kidd et al. 2000; Rivera and Zijp 2002; Chapman and Tripp 2003; Rivera and Alex 2005; Birner et al. 2006; Chipeta 2006; Anderson 2007; Birner and Anderson 2007). In economic theory, the term *demand* refers to the amount of good or service that a consumer is willing and able to buy at a given price. In principle, the market mechanism would make agricultural extension demand driven, but as discussed further in Section 2, agricultural extension is characterized by various market failures (Table 1). Therefore, other approaches are needed to make extension demand driven. This paper focuses on the community-based extension (CBE) approach as a strategy to reach this goal. Hence the terms *demand driven* and *community based* are used interchangeably here. In their purest form, in such extension approaches the providers of service are contracted directly by farmers’ groups or communities to deliver information and related services that are specified by farmers. There are various ways of financing such systems (Katz 2002), but in actual practice the funds to finance the contracts can be provided in part or in full by governments. Yet, the contracts are issued and monitored by the community of clients. Ideally, decisions about contract renewal are made by the community as well, based on its satisfaction with the quality of services rendered in the past. Such a *modus operandi* is expected to provide agents with stronger incentives to provide quality advice. Furthermore, the design ensures that information and other services are in line with farmers’ needs and priorities. Several variants of such CBE approaches have been implemented in the past 15 years, mostly with public funding of the extension providers’ costs (Keynan, Olin, and Dinar 1977; Kidd et al. 2000; Dinar and Keynan 2001; Chapman and Tripp 2003; Hanson, Just, and Lainez 2006; Anderson and Feder 2007; Birner and Anderson 2007).

In this paper, we apply Hayami’s insights on the community mechanism to discuss in some detail the conceptual underpinnings of CBE approaches, highlight theoretical and practical challenges inherent in their design, and assess the evidence available so far on their actual performance. Accordingly, the next

section describes features of agricultural extension relevant to understanding system performance. The subsequent section outlines approaches to meeting the challenges through community-based, demand-driven systems. We then review some real-world experiences with such systems, and conclude with a summary of the insights gained and their implications for development policy.

2. MARKET AND STATE FAILURE IN AGRICULTURAL EXTENSION

The literature on agricultural extension highlights a number of market failures that provide justification for some form of collective action to ameliorate those shortcomings. Birner and Anderson (2007) review several types of extension-related market failures, which are summarized in Table 1.

Table 1. Types of market failure in agricultural extension

Reason for Market Failure	Explanation
Public good	Information delivery, a key task of extension, often has public-good characteristics, as the information may not entail excludability and rivalry.
Merit good	Extension services can be a merit good, which implies that the clients undervalue the benefits due to insufficient information or an overly short planning horizon (a characteristic of poorer farmers).
Externalities	Extension activities may carry externalities in that their impact serves national, possibly noneconomic, objectives (such as food security or environmental goals).
Transaction costs	The provision of information to large numbers of spatially dispersed and imperfectly organized smallholders entails economies of scale due to high transaction costs.

Source: Based on Birner and Anderson (2007).

Such failures explain the practically universal involvement of national or lower-level governments with extension services, although the involvement does not necessarily require the provision of service through the staff of a public-sector organization. The disenchantment with direct service provision by the public sector to which we alluded in the introduction stems from a number of attributes that are frequently inherent in the way public extension systems are organized and managed. Feder, Willett, and Zijp (2001) and Birner and Anderson (2007) provide an extensive discussion of the (often interrelated) attributes leading to state failure in agricultural extension. We summarize them as follows:

(i) Scale and complexity. The cost of reaching large numbers of geographically dispersed, remote, and often not highly literate smallholder farmers who have limited access to mass media is high in many parts of the developing world. The problem is aggravated by the fact that farming systems are often complex (having several types of crops and livestock) and entail variation in soils, slope and micro-climate. Budgetary and practical considerations compel extension agents to interact directly with only a fraction of their clientele. It is often the larger-scale, better-resourced, and more innovative farmers who get the attention of extension agents, because they are more likely to provide small rewards to the agents, or because they can readily follow the advice given, even if it requires acquisition of purchased inputs (for example, fertilizers). Such concentration on a nonrepresentative portion of the clientele naturally reduces the potential for farmer-to-farmer diffusion, which in turn reduces the benefits and impact of extension (cf. Pritchett and Woolcock 2004).

(ii) Dependence on broader policy environment. Just as with other agricultural programs, the impact of extension activities depends not only on the design of the specific program or service delivered but also on other policies and investments where the decisionmakers are exogenous to the extension system (for example, price policies, input supply systems, rural credit, transport infrastructure). Extension's impact may be more adversely affected by this dependence if the feedback (regarding relevance and implementability) to the designers of key information and advice content is deficient, either because the feedback comes from nonrepresentative farmers (due to issues raised in item i) or because the incentives of agents to provide detailed feedback are compromised (discussed later in this list).

(iii) Interaction with knowledge generation. In most countries, agricultural research organizations and agricultural extension organizations are managed as separate entities. Coordination and two-way feedback flows have often been deficient (Mureithi and Anderson 2004). The incentive structure in research organizations seldom links researchers' payoff directly to the performance of farmers, and thus the prioritization of research agendas (on which extension management usually has limited influence) does not always closely reflect farmers' priorities. Consequently, extension agents may not have the knowhow to advise farmers on some specific issues that significantly affect agricultural performance.

(iv) Public duties other than knowledge transfer. Extension workers are mostly civil servants (whether they are local government or national government employees), and they often constitute the most extensive field-level cadres that governments have. Governments therefore are tempted to use extension staff for other (nonextension) duties, whether as routine additional assignments or as ad hoc tasks (such as collection of agricultural statistics, distribution of subsidized inputs, rural health and family planning programs, and election campaign work on behalf of local or national ruling parties). Furthermore, some of the nonextension tasks provide opportunities for monetary gains through corruption (for example, the distribution of rationed inputs), and agents may have incentives to focus on these.

(v) Difficulty in attributing impact. Farmers are better placed to assess the quality and impact of agents' work than extension supervisors. The latter cannot easily determine the contribution of agents' efforts to agricultural performance, because it is affected by a multitude of exogenous factors as well as farmers' circumstances, making it difficult to assess what contribution has been made by extension services to the actual outcomes on farmers' fields and to farmers' incomes. Moreover, the incentives to deliver high-quality monitoring information are typically weak (Martens et al. 2002, 20).

(vi) Weak accountability to farmers. Most public extension entities are organized as hierarchical public services, where employees are accountable to their superiors, and the ultimate accountability of the organization's leadership is to local (county, province) or national political authorities. In smallholder-dominated developing countries, farmers are often not sufficiently organized as a political constituency to be able to exert influence on extension management. Even when farmers are organized in national or large regional associations, they are often dominated by larger-scale and wealthier farmers, so that even where farmers can influence the content of extension programs, such content may reflect the priorities and interests of limited and better-off groups, rather than those of the numerically larger but poorer farm classes.

(vii) Bureaucratic procedures. As in many government organizations, bureaucratic management and personnel procedures make it difficult for extension agents to respond flexibly to local demands, especially in highly centralized systems. Encouraging processes of institutional learning and change is a major challenge in public-sector agencies. Likewise, bureaucratic structures often discourage the coordination of agricultural extension with other departments. As pointed out previously, even links to the agricultural research system are often weak in spite of their obvious importance.

(viii) Weak incentives to perform. Because supervisors have difficulty attributing impact at the farm level to the effort of individual agents, and because agents are typically not accountable to the farmers (who are actually the best judges of extension agents' relevance and effectiveness), agents are not strongly motivated to exert themselves. This is reflected variously in a limited effort to interact with farmers in the field, little willingness to learn from farmers' experience, low-quality and generic advice offered, and weak incentives to invest in updating one's knowledge or to acquire skills for effective dissemination of

knowledge. At higher management levels, there are no incentives to create mechanisms (for example, participatory processes) for fostering accountability to the grassroots clients who can best observe the quality and quantity of extension input, or to give farmers a say in the prioritizing of extension programs.

(ix) Weak political commitment and support. Because even in the aggregate it is difficult to attribute agricultural performance to extension efforts, and because extension activities are not as visible as other rural investments such as irrigation or road projects, politicians may perceive a lower (political) payoff to extension expenditures. Thus, in a context of limited fiscal resources, decisionmakers tend to assign low priority to extension. This situation will be exacerbated by (often justified) perceptions of poor performance of the system as a whole, which emanates from the incentive problems outlined previously. Sporadic expansions of extension systems that are spurred by external donor-funded programs tend to be short-lived because, once the external funding is exhausted, there is no domestic political support for the higher levels of funding (Anderson, Feder, and Ganguly 2006).

Over the years, extension scholars and practitioners have recognized the preceding weaknesses and issues, and they have proposed and introduced various reforming fixes and modifications to address them (Feder, Willett, and Zijp 2001). Among the fixes, CBE is perceived by many observers as a particularly important strategy because it promises to overcome both the state failures and the market failures inherent in extension (see World Bank 1996; Rivera and Zijp 2002; World Bank 2005b).

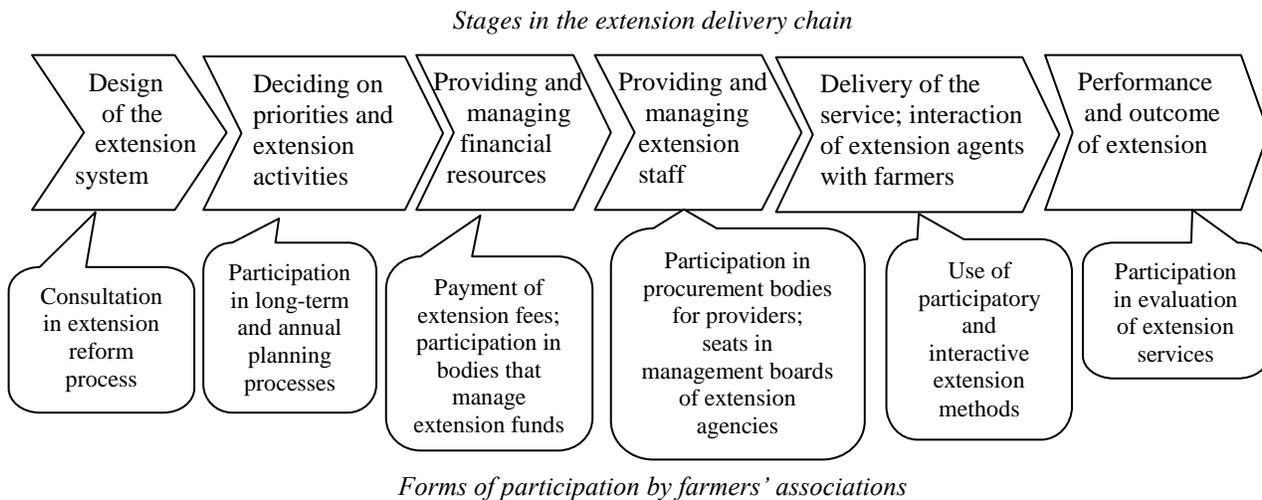
3. COMMUNITY-BASED EXTENSION IN THEORY

This section discusses the potential and the challenges of CBE to overcome the problems that plague state-managed extension systems. The discussion mainly draws on collective action theory and the concept of social capital. We begin with an overview of different forms of CBE.

Levels of Community Participation

As indicated in the introduction, in the purest form of CBE, the extension service is contracted by the community or is part of the staff of a farmers' association. In a more diluted format, of community extension, farmers' organizations, whether representing single communities or wider constituencies, have a say in the design and execution of extension programs. The latter approach can improve the extension service received by farmers and may provide advantages to smallholders. In most developing countries, the farmers-to-agent ratio is more than 1,000:1 (see Anderson and Feder 2004). Hence, farmers have a hard time exercising demand and holding service providers accountable without some form of organization. Farmers' associations can play an important role in aggregating farmers' demands for extension and in representing farmers in participatory models of extension management so as to make extension more demand driven. As Figure 1 illustrates, farmers' associations can exercise demand in different stages of the agricultural *extension delivery chain*.

Figure 1. Participation of farmers' associations in different stages of the extension delivery chain



Source: Authors, adapted from World Bank and IFPRI (2010, Figure 2.2).

The associations may influence the design of a new extension service, for example, by taking part in consultative workshops held during a reform process. Farmers' associations may also participate in the annual and long-term planning of agricultural extension activities. They can help finance agricultural extension by collecting fees from their members, and they may have a seat in bodies that manage extension funds. If extension is contracted out, they can represent farmers on procurement boards charged with hiring extension providers. If service provision is not contracted out, they can still influence what extension agents do by participating in the management boards of extension agencies. In the process of extension delivery, farmers can participate if participatory and interactive extension methods are used. Last but not least, farmers' associations may contribute to the evaluation of the performance and impact of agricultural extension providers.

Advantages of Community-Based Extension

One advantage of a CBE system is that it can benefit from the social capital of rural communities and farmers' organizations. Hayami (2009, 98) defined social capital as the "structure of the informal social relationships conducive to developing cooperation among economic actors aimed at increasing social product, which is expected to accrue to the group of people embedded in those social relationships." Moreover, farmers' organizations can help reduce the transaction costs of providing extension, as in group-based extension approaches, thus relieving some of the problems emanating from the scale and complexity of traditional extension systems (issue i in Section 2). Another advantage of CBE is that providers of extension advice are, in principle, directly accountable to the farmers who are members of the community or the organization. An effective role in the contracting of service providers and in the assessment of their performance is crucial in creating such accountability (issue vi in Section 2). Thus, when designed properly, CBE can overcome the critical issue afflicting traditional top-down extension systems—namely, weak incentive to perform to the satisfaction of farmers (issue vi in Section 2). The difficulties of monitoring and attributing impact and assessing relevance are also less acute, as the services are focused on issues reflecting farmers' demand, and farmers are involved in providing feedback or even in assessing the service (issue v in Section 2). The prospects for garnering political support are also better (and the derived budgetary support and financial sustainability): a more effective service with attributable impacts can produce political payoffs for local and national politicians (issue ix in Section 2). Moreover, in CBE the public-good aspect of extension is defined at a local or community level, and this may enable some cost recovery, as the *free rider* problem (see Section 3.3) is easier to resolve. However, several issues, some specific to CBE and some typical of extension systems, may hamper the effectiveness of CBE, and it is to those that we now turn.

Challenges of Community-Based Extension

A major challenge for CBE is the classical problem of collective action (Olson 1965): if the benefits of extension advice are nonexcludable, farmers have limited incentives to incur the transaction costs of participating in the organizational activities that are related to the establishment and management of the organization (the free rider problem). The incentives to join local farmers' groups for the purpose of group-based extension may be rather strong, because the participants expect to benefit directly from their participation, and the already high social capital is reinforced. However, to participate in extension planning and management beyond the local level, farmers need to become organized at a more aggregate level, which poses its own challenges. The literature on the role of group size and heterogeneity in collective action is extensive, and the relations continue to be debated (Poteete and Ostrom 2004). Often, farmers have social capital that has been generated in the context of their small community and that would facilitate group activities and induce leaders and members to exert unpaid efforts on behalf of the group. But that capital may not exist across communities (Hayami 2009). That is, to the extent that CBE requires organization and collective action across communities, the incentives may not suffice. Donor-sponsored CBE programs often tackle this problem by financing the organization of cross-community farmer entities and compensating farmer leaders and representatives for the time and effort they invest in such collective activities. However, it is a common phenomenon that organizations formed for donor-funded projects collapse once project funding ends (for example, Ameer 1994; Purcell and Anderson 1997 for the case of extension). As Hayami (2009, 115) points out, "The hasty expansion of community-driven participatory development projects by external aid agencies, along (sic) the current vogue of social capital and community participation in the absence of real understandings of local economic and social systems, has resulted in a serious waste of development resources."

There is another issue that many participatory development programs encounter, one that is likely to affect CBE programs that depend to some extent on public-sector implementation mechanisms. The problem arises from the entrenched, top-down, patronizing attitudes that often characterize all levels of governments that deal with small- and medium-scale farmers. Thus, even when CBE concepts and participatory operational modalities are championed by influential policymakers (possibly encouraged

and fortified by the financial and intellectual support of external donors), resistance may occur at various levels of the relevant bureaucracies. Resistance may reflect itself in attempts to dilute participatory bodies' powers, foot-dragging on budget transfers, and co-option of farmer leaders to support the interests of the bureaucracy rather than those of the community. Training of various levels of government in participatory concepts is a solution often adopted by champions of CBE, but it may not suffice to resolve the problem, as pointed out by Braun et al. (2006, 35): "given that farmers, and especially women, have very little political influence in most developing countries, such efforts to move towards participation [in extension systems] often flounder on bureaucratic procedures, hierarchical structures, political exigencies, budget constraints, etc."

Consistent with Hayami's (2009) analysis of the community mechanism, CBE systems are not equally suited for all kinds of extension. They have particular comparative advantages to facilitate extension for activities that require collective action, such as many types of natural resource management and pest management. Where farms are diverse in enterprise mix and where more farm-specific advice is required, the comparative advantage of CBE approaches is lower. Thus, different farming systems require different types of extension systems.

Another major challenge to CBE is avoiding social exclusion and elite capture—both of which are common problems in rural development programs and in extension specifically. Rural communities and farmers' organizations are often dominated by middle-class and relatively wealthy farmers. Poor farmers and socially marginalized groups typically play a limited role in the leadership of communities and rural organizations, even if they are members. In particular, the representation of women is often low, a problem linked to the sociocultural role of women in many societies as well as to the time constraints faced by women (see Meinzen-Dick and Zwartveen 1998; Quisumbing 2003). One strategy to deal with the elite capture and the social exclusion problems is the formation of specialized organizations, such as groups exclusively for women farmers, or the allocation of reserved seats for women and disadvantaged groups in participatory planning and management boards.

The concept of CBE presumes that sufficient numbers of would-be qualified advisory professionals (or organizations containing such professionals) are available to do the needful work (Chapman and Tripp 2003, 7). Often, the expectation is that the existing public extension service cadres would form the core of such an industry, either as part of a semi-autonomous public (or privatized) entity that can be contracted, or as individual professionals following a privatization of the extension service. The nongovernmental organizations (NGOs) dealing with rural development services in some countries are also viewed as potential extension service providers. The designers of CBE projects commonly pay attention to the issue of accrediting and regulating service providers. However, in countries with endemic governance deficiencies, the process of accreditation may be corrupted. The background and training of the pool of potential service providers (including the existing public extension personnel) may not suffice to address the more specific and localized issues that are likely to be brought up in a demand-driven system. Large-scale training (at public expense, at least initially) may be required (Chapman and Tripp 2003).

Community organizations are not immune to mismanaging funds. When an organization deals with various farmers' agendas rather than exclusively with extension, agricultural extension may not necessarily be a priority for the leadership of the organization. Lobbying for state support in the form of subsidies is often a higher priority than helping the members become more competitive. On the other hand, integrating extension into an existing entity that was founded for a broader set of goals is an important strategy to reduce the transaction costs of collective action. Elite capture of a different type occurs when leaders of large organizations may have incentives to run for political office, which in turn could lead to conflicts of interest. As noted, politicians have also been known to misuse public extension systems for their own purposes. Private provision of extension dodges most such political capture problems but fails to serve many impoverished groups adequately. So, CBE approaches, although not risk free, may present the most attractive options for extension provision in many situations. Accordingly, the important matter of performance in practice should be turned to, as in the section that follows.

4. COMMUNITY-BASED EXTENSION IN PRACTICE

The literature provides extensive coverage of experiences with CBE in the past two decades. However, much of the material is descriptive, and even within the empirical literature there is a paucity of rigorous econometric studies. As we will argue, there are ample indications that the difficulties envisaged theoretically are indeed encountered in practice, and are amplified by practical implementation hurdles that are specific to CBE initiatives. The following section focuses on three cases of CBE, which represent different empirical examples of the approach.

Three Examples of Community-Based Extension

The first example of CBE is the National Agricultural Advisory Services (NAADS) program of Uganda, the first large-scale program in Africa that involved the contracting out of agricultural extension. The second example is the farmer field school (FFS) approach to extension services, which has been promoted in a large number of countries. FFS contains important elements of community-based extension, and the experiences with its implementation provide useful insights. The third example is the agricultural technology management agency (ATMA) model. The ATMA model is being implemented in India, and is one of the largest applications of decentralized CBE. Our discussion of the ATMA approach focuses on implementation cases that have been supported by the World Bank; other cases likely feature less community engagement (Raabe 2008).

Uganda's National Agricultural Advisory Services

NAADS is a decentralized program that was initiated in 2001 in 24 subcounties of several districts of Uganda. With support from several donors, the program aimed to reach national coverage in 2008 (Uganda, Ministry of Agriculture, Animal Industry, and Fisheries 2007). As further discussed below, NAADS underwent some major changes in 2009. However, this paper refers to the NAADS structure that was in place prior to these changes since the available literature refers to this structure. In terms of Figure 1, NAADS represents a far-reaching model of community participation, because farmers' organizations are involved in each step of the extension delivery chain (even though it is not clear to what extent they were involved in the reform process that led to the design of the NAADS program). The program is centrally guided but is implemented and administered in a decentralized manner, at least partially within the country's existing local government structures. A national board formulates strategic objectives, selects districts and subcounties to be included in the program (based on agreed criteria), defines key implementation procedures (such as procurement procedures, monitoring and reporting requirements), and provides technical services to local government levels of the program on issues that are beyond their capacity. The board is also responsible for certification, regulation, and overall quality verification of extension service providers (who may come from the private sector, NGOs, or semipublic organizations).

In participating districts, the implementation of the program is overseen by a chief administrative officer supported by district councils. The councils, which include local politicians representing various stakeholders, officials, and farmers, oversee procurement boards. They were expected to also guide the process of converting local public extension workers into private advisory service providers (relatively little progress was achieved on this). Within each district, participating subcounties form a council (composed of local politicians, officials, and stakeholders) that is responsible for local-level strategy, liaising with districts, managing program funds, and involving farmers' forums (composed of representatives of farmers from groups of villages) in planning and setting guidelines (Uganda, Ministry of Agriculture, Animal Industry, and Fisheries and Ministry of Finance, Planning, and Economic Development 2001).

Within the NAADS subcounties, farmer-participants (who make up only a fraction of the farming population) organize themselves in farmers' groups based on members' shared priorities and needs.¹ Each group elects two representatives to the subcounty farmers' forum, and it is at that level that priority technology needs are identified. The program manual requires that only three priorities be selected in each subcounty (NAADS 2004). Nominally, the forum, jointly with local officials, contracts and monitors service providers who deliver training and advice in the identified priority areas.

Whereas the budget for the program at the local level is provided mostly through earmarked transfers from the national government (largely using targeted donor-supplied financing), those resources are to be complemented by an allocation from subcounty and district governments' regular budgets (5 percent) as well as a nominal contribution (2 percent) from farmer-participants (Uganda, Ministry of Agriculture, Animal Industry, and Fisheries and Ministry of Finance, Planning, and Economic Development 2001).

The Farmer Field School Approach

The FFS approach to delivering information and educational services was designed originally as a means to introduce knowledge of integrated pest management (IPM) to irrigated rice farmers in Asia, but it has since been expanded to numerous countries, covering various agricultural themes (van den Berg and Jiggins 2007). A typical field school educates farmer participants on agro-ecosystems analysis as well as specific technological features of their crops and the field environment. In terms of Figure 1, FFS involves farmer participation in the stage of extension delivery where the extension agents interact with the farmers. However, extension agencies that use FFS may also involve farmers' groups in other stages of the extension delivery chain, such as financing.

The FFS approach relies on participatory training methods to convey knowledge to field school participants, with the extension agent-trainer expected to act not just as a transmitter of information but mainly as a facilitator encouraging farmers' own discovery and discussion of their experiences and observations. A typical FFS entails a season-long sequence of half-day sessions of hands-on farmer experimentation and informal training to a selected group of 20–25 farmers during a single crop-growing season. The selection of participants into the training is done with strong community involvement through its established leadership and existing social structures. The participants are expected to contribute to the wider community through dissemination of knowledge and follow-up activities such as field experiments and collective actions. Initially, paid trainers or public extension staff lead the training. Through group interactions, attendees sharpen their decisionmaking abilities and are empowered by learning leadership, communication, and management skills (van de Fliert 1993). Some of the participating farmers may be selected to receive additional training to be qualified as farmer-trainers, who then take up training responsibilities (for some fee, possibly paid by their community) with official backup support such as training materials.

India's Agricultural Technology Management Agency Model

The ATMA model of participatory decentralized extension was implemented originally as a pilot program in a World Bank–funded agricultural development project in India in the period 1998–2003. It has since been expanded to a national program funded by the Indian union government. The program operates at a district level (there are some 600 districts in the 28 states of India) and entails within each district a semiautonomous agency (referred to as an ATMA) dealing with extension matters. The agency can receive both public and private funds, as well as charge fees to clients. Each ATMA is directed and overseen by a governing board that includes representatives of all farmer classes in the district, as well as other stakeholders (private sector, rural banks, NGOs, official agencies dealing with agricultural development). The governing boards define strategic priorities reflecting the interests of the

¹ In 2009, NAADS introduced a system of providing substantial amounts of funds to selected individual “demonstration” farmers (see NAADS website < <http://www.naads.or.ug/news.php?id=90>>, accessed 03/03/10.)

constituencies represented on the board. Within each village, farmers are also organized in self-help groups and other farmer interest groups, and these groups elect representatives into the block (subdistrict) farmer advisory committee (FAC). The chairs of the FACs serve on the ATMA governing board, which is led by the district collector (the most senior district government official). The ATMA director is a nonvoting member of the board. Block work programs are prepared by agricultural extension officials but need to be approved by block-level FACs before being sent to the ATMA governing board for review and approval. The FACs meet monthly to review progress in implementing the annual work plans and to suggest revisions. The design of the system thus provides, at least nominally, for ample farmer influence on extension activities, since every village is represented in the FAC (Swanson 2008). In terms of Figure 1, the ATMA model involves farmers' organizations in all stages of the extension delivery chain, even though—unlike NAADS—it does not involve the contracting out of extension provision.

With this background on the NAADS, FFS, and ATMA models, we can turn to a review of the limited evidence on performance of CBE approaches. Section 4.2 presents evidence from qualitative studies, and Section 4.3 reviews quantitative impact assessment studies. Both sections focus on the three models just described, but where evidence is available, they also refer to other cases.

Evidence on the Performance of Community-Based Extension from Qualitative Studies

This section reviews to what extent there is empirical evidence of the problems with CBE that were identified in Section 3 on a theoretical or conceptual basis.

Exclusion and Elite Capture

Insights on the risk of capture (which, as we noted earlier, is not unique to CBE) are derived from the experience of the NAADS program in Uganda. Several observers, cited in this paragraph, commented on a bias in implementation, leading to the favoring of wealthier farmers. Thus, one early study concluded that the mobilization of groups through local government leaders appealed to the progressive wealthier elite while “the poorer sections of the population . . . were perceived to be excluded,” and that NAADS had “a strong bias towards the better off” (Boesen, Miir, and Kasozi 2004, 66). A study of the Mukono district reports that farmers perceive that “poor farmers were left out” and suggests that the “required relatively high levels of literacy and the lengthy debates (on prioritization) precluded women and the poor” (Obaa, Mutimba, and Semana 2005, 8–9). An OXFAM/FODOWE study cited by Kibwika (2006, 101) reports on the basis of a 2004 survey that “the only people who benefit from NAADS are those with convertible assets . . . or those with access to external financing such as remittances.” Similarly, Parkinson (2008) observes that by 2006, the program had “introduced a number of short-term approaches that systematically rewarded wealthier and more connected farmers.” In support of this statement she provides data showing that NAADS group leadership comprises farmers of higher education and wealth status than that of regular members, concluding that “poorer farmers . . . were less able to benefit from the types of technology NAADS provided” (164–165). Bukenya (2008) arrives at a similar conclusion.

Farmer field school training programs have also been reported to be vulnerable to elite capture. In her study of the early phases of FFS training in Indonesia, van de Fliert (1993, 157) commented that “the composition of the field school groups observed was not representative of the farmer population in the villages. The groups contained many village officials, and farmers with relatively high education, large (owned) fields, and off-farms jobs, and no women at all.” A later report on the Indonesian experience cites observations of a field operative complaining that the relegation of participant selection to the established village leadership resulted in preference for members of the village elite (Fakih, Rahardjo, and Pimbert 2003, 36). More generally, the report concluded that the FFS effort in Indonesia has not been characterized by equity in its coverage (64–65). Similarly, Feder and Savastano (2006) demonstrated econometrically in their analysis of Indonesian field school data that wealthier farmers with higher educational attainment had a higher probability of being selected for participation in the FFS training than others.

A study of livestock field schools in Vietnam claims a necessity (in the context of that particular training theme) to skip the poorest segment of the community because of a perception that such people could not marshal the resources to raise even small livestock (Dalsgaard et al. 2005, 10). The study cites, however, evidence from livestock field schools in Bangladesh, Benin, and Senegal, where adherence to poverty- focused selection criteria yielded satisfactory levels of participation by the poor.

The Decentralized Agricultural and Forestry Extension Project in Indonesia, whereby farmers' groups received grants to commission training and demonstration materials from public extension agents, reported only "isolated" incidents of elite capture (World Bank 2005). However, it is observed that among the 16 reported village-level case studies' training activities, nine cases entailed training of groups amounting to less than 20 percent of the farming households (five cases involving less than 10 percent of farming households). Since the project did not include specific poverty-related selection criteria, it is not obvious that the poor received much representation in such small select groups.

Difficulties in Implementing Farmers' Priorities

Uganda's NAADS program illustrates the practical difficulties of attempting to reflect farmers' priorities in the advice delivered by service providers, even within a nominally demand-driven CBE system. Several observers of the program (cited in this paragraph) suggested that farmers' actual control of priority setting for their groups' training is limited in reality (especially with the rather arbitrary restriction to only three commodities), undermining one of the key expected advantages of CBE systems. Obaa, Mutimba, and Semana (2005) describe the elements of the decision chain that leads to the design of a service contract by a provider within the NAADS program. Ultimately the priorities in the service contract are not defined for each group separately, but rather are determined at the subcounty level, and consequently the content of the training reflects an aggregate demand of many groups as well as top-down priorities of the national and local government (emphasis on commercial crops). The training received by any group may therefore contain only some or none of the priorities expressed by that specific group. Indeed, Obaa, Mutimba, and Semana report cases where farmers were actually getting advice on enterprises that were not their priority. Similarly, a study in one NAADS district (Friis-Hansen 2004) reports participants' frustration with the length of time consumed by various layers of the enterprise prioritization process, noting that "the enterprises on which they receive advisory services only rarely [are] similar to those for which they articulated needs" (9), partly because of NAADS's emphasis on commercial crops that are often not farmers' first priority. Frustration with the priority-setting process is reported to have led to high participant dropout rates (Parkinson 2008). The practical difficulty seems to stem from the high administrative transaction cost of establishing a financing and procurement system that can transfer funds down to a community (single-farmer-group) level and enable direct contracting of services by a single farmer group. In addition, such a system faces a challenge in monitoring the uses of funds and is prone to elite capture and corruption even at the community level, as discussed by Platteau and Abraham (2002) and Deininger and Liu (2008). In Chile and Costa Rica, the government attempted to reduce the transaction cost of making funds for contracting extension available directly to farmers through the distribution of vouchers. The farmer-holders of vouchers could use them to pay qualified extension service providers. As farmers made their payment directly to the service provider, it was expected that their priorities would be fully addressed by the extension agent. However, the institutional arrangements required to monitor and control the use of the vouchers so as to prevent fraud were inadequate, leading to major abuses and reduced effectiveness (Dinar 1996; Berdegué and Marchant 2002; Cox and Ortega 2004; Bebbington and Sotomayor 1998). Evidently, an appropriate control system needs to be significantly more extensive and hence more expensive.

Difficulties in Implementing Farmers' Control of Service Providers' Contracts

As argued in Section 3, effective control of service providers' contracts by the community is critical to generate incentives for high-quality service delivery. Again the NAADS system in Uganda illustrates the practical difficulties in translating this principle into reality. As noted, contracts within NAADS are

awarded by the subcounty administration because no mechanism exists to transfer funds down to a village community level. Farmer group members themselves do not monitor the performance of service providers; instead, that responsibility is given to the farmers' forum that represents farmer groups from the entire subcounty. The existence of a wedge between the actual service recipients and the issuers and enforcers of the contracts weakens providers' accountability to the farmers who receive advice, and thus diminishes the incentives to provide high-quality service. Even the monitoring by representatives of the farmers' forum is deficient: farmers entrusted with this task are supposed to receive compensation for the time and effort exerted in monitoring on behalf of the larger community. However, funds to pay them are often not available, reducing the incentive to perform a role that only marginally serves their own farming group (Muwonge 2007). Evidently, the farming population of a subcounty is not perceived as a community in a social sense, and thus it does not possess the social capital that would facilitate and induce voluntary (unpaid) actions on behalf of the group. As Hayami (2009, 111) argues, "For the community to have sufficient social relation capital in organizing cooperation among its members, its membership must be small enough to ensure intense social interactions."

Limited Availability of Competent Service Providers

The advantages of CBE (and more generally all demand-driven extension systems) are predicated on the availability of a cadre of skilled service providers who can compete for the extension contracts that communities issue. Those providers who do not perform satisfactorily would then be weeded out by the competitive market process. Centralized screening and accreditation mechanisms can be introduced to limit the ability of unqualified service providers to take advantage of farmers' lack of familiarity with the true capacity of a bidder in the initial phase of a CBE program. However, in many developing countries there is a rather thin market of qualified service providers, and the situation is exacerbated by the vulnerability of the accreditation mechanism to corruption and political manipulation. In some more-developed countries (for example, the United Kingdom and New Zealand), the privatization and dismantling of public extension systems released into the market for extension service provision large numbers of competent would-be advisers. In contrast, the skills of extension staff in many developing countries were built on a slender educational preparation and were geared toward generic technology messages, rather than the more specific and localized issues that farmers tend to identify as their priorities. A transitional period whereby potential service providers equip themselves (through training and recruitment) with the skills that are likely to be demanded would need to be taken in account. However, that generates an incentive problem, as it is unlikely that potential providers would heavily invest their own resources in training staff prior to actual identification of demand and assurance of landing contracts. This induced Chapman and Tripp (2003, 7) to perceive a public-sector role in organizing and funding training in the transitional phase. The issue is even more acute when the dismantling of the public extension system is held up by political or administrative obstacles. This is illustrated by the experience in Uganda, where the retrenchment of the public extension system that was planned to run in parallel with the implementation of the CBE seemingly did not materialize due to legal issues. Cadres of the public extension service providers were therefore mostly not available to compete for the provision of services, and various NGOs, private groups, and semipublic entities, of varying backgrounds and records, gained contracts. Procedures for providers' qualification and accreditation could be implemented only with delay and were fraught with irregularities, and the training and skills updating (funded in part by the NAADS program) were not systematically carried out. The inadequacy of service providers and the resultant low quality of service were highlighted in the NAADS midterm review (Kazigati 2005, 45; Nyanzi 2005, 46). Similarly, Ekwamu and Brown (2005, 28) reported that "the quality of service provision emerged as a major issue in personal interviews with farmer groups." Deficiencies and irregularities in the procedures for procuring service provision are claimed to have led to the award of contracts to providers who lacked qualifications and who consequently delivered low-quality service (Parkinson 2008, 139–140). Based on field interviews, Muwonge (2007) raised concerns regarding service quality, which he attributed to deficient monitoring of provider performance.

Newspaper reports also point to wide-spread corruption problems in procurement contracts under NAADS (New Vision 2010). In 2009, the Ugandan government announced the reintroduction of the public extension service as the main extension provider in the NAADS program.

Problems of inadequate availability of qualified service providers also afflicted the voucher-based extension programs in Chile and Costa Rica in the early 1990s (Ameur 1994; Bebbington and Sotomayor 1998). China's program, whereby farmer associations contract technical services from public entities such as research institutes, universities, and individual scientists, was also assessed to have suffered due to the limited access to subject matter specialists (Kidd et al. 2000). The current scaling-up phase of the ATMA program in India is claimed to be adversely affected by limited capacity of existing personnel and the inadequate skills of extension agents inherited from the long-defunct Training and Visit (T&V) extension system (Sulaiman and Hall 2008; Swanson 2009).

Changing the Attitudes and the Top-Down Orientation of Extension Organizations

Most CBE programs maintain a dependence on public-sector organizations (whether at the local or national level, or both), and they are introduced with the encouragement and initial funding of external donors. The long-term effectiveness and sustainability of such reforms depend crucially on the extent to which government bureaucracies and field-level workers can adopt the participatory mode of operation that underlies CBE. The pilot phase of the Indian ATMA model illustrated that a formal structure of governance that deliberately engages beneficiaries, and appropriate training of extension personnel, can indeed flourish in what is traditionally a top-down field of extension endeavor in that nation. According to Swanson (2008), the farmer-orientation of the ATMA model in India positively affected the motivation and morale of the field extension staff: "For the first time, they could see the direct impact of their work on the lives of farmers, farm women and rural young people within their block and district. This new arrangement had a direct and positive impact on their performance. In the process, they were transformed from merely transferring technology (for example, delivering information) to becoming problem solvers in working with farmer groups to identify and help solve specific problems or needs in pursuing different enterprises" (32). However, Swanson (2009) points out that when the program moved to a national scale, funds for appropriate training of extension staff in the concepts and methods of participatory processes were not provided, resulting in disappointing performance. Similarly, Sulaiman and Hall (2008, 3) refer to "attitudinal barriers at all levels" and "lack of local ownership" as two of the factors underlying their concern that ATMA will suffer the same fate as the failed T&V extension system.

Given that most extension officials have been brought up in a top-down organizational culture where farmers are viewed as wards of the state, it is not surprising that change is difficult and reversals occur. In the Ugandan NAADS system, local governments do not fully "own" the community-based approach, even though it has some strong champions at the national level (Muwonge 2007). This is reflected in foot-dragging on local complementary budget allocations, and in the assertion of de facto control of contracting by officials at the subcounty level, even though the farmers' forums were supposed to have much influence over that responsibility. The emphasis on commercial crops that reflects the agricultural development strategy of the national government often takes precedence in selecting training programs over expressed priority needs of farmers' groups (Bahiigwa, Rigby, and Woodhouse 2005). In Indonesia, a review of two decades of FFSs concluded that although many field-workers subscribe to the participatory principles of the community based approach, "there is little evidence that the culture and practice of participation in Community IPM has fundamentally influenced government bureaucracies. Overall, the FAO-Government programme on Community IPM has had little enduring effect at higher levels of the bureaucracy. Relatively more progress and change have occurred at the provincial and district government levels. . . . In broad terms, lack of real change in organisational culture, structures and procedures were the main obstacles for the uptake and institutionalisation of Community IPM in the bureaucracy" (Fakih, Rahardjo, and Pimbert 2003, 45–46).

Observers of the experience of the decentralized extension project completed in Indonesia in 2005 highlighted the limited comprehension by local-level staff of the CBE concept, and perceived that a

couple of staff-training workshops over a period of a few months would not suffice to change a mind-set developed over years of top-down interaction with farmers (Bourgeois and Kusumaningrum 2006, 77). This is reflected by the ineffectiveness of a key local institution—the district extension committee, or DEC—which the project created as a stakeholders’ forum (including, in particular, farmer representatives) to provide strategic guidance and define extension priorities. As the authors of a project completion report noted, “most DECs remain dominated by government through an over-representation (usually 50 percent or more) or perceived authority of government members” (World Bank 2005a, 8).

In Vietnam, the introduction of participatory extension through a livestock field school program faced significant difficulties because of “a strong inclination towards applying the familiar (and thus comfortable) style of top-down instruction” (Dalsgaard et al. 2005, 5). The external donors (who were promoting a CBE concept) had to compromise and accept a system that retains a distinct flavor of traditional top-down technocratic extension development, because “too much ‘participatory arm twisting’ by external advisors was not welcome” (Dalsgaard et al. 2005, 6). More generally, after almost two decades of experimentation with FFS approaches in various crops in Vietnam (invariably with external donor funding), the field school model has not yet been widely mainstreamed into the agricultural extension system of Vietnam (van de Fliert et al. 2007).

Evidence on the Impact of Community-Based Extension from Quantitative Studies

There have been several quantitative analyses of the impacts of CBE programs. A number of these studies deal with small-scale pilot programs or with a limited geographical area within a national program. It is therefore difficult to ascertain to what extent their results would hold for a large-scale program, or whether they are representative of a national program. Studies of CBE are also subject to the typical methodological and data challenges that make the evaluation of extension impact difficult (Birkhaeuser, Evenson, and Feder 1991).

A study of two pilot programs in Nicaragua (Dinar and Keynan 2001) used secondary data to calculate incremental farm-level net revenue margins for one program and benefit–cost ratios for the other program. Both programs arranged for service contracts between public (in the case of the first program) or private (in the case of the second program) service providers and farmers, with a substantial public subsidy. Gross margins varied among the four regions in the first program, and the aggregate gain, while positive, was not considered robust. Moreover, the calculation did not account for government expenditures and did not allow statistical testing. The analysis of the second program suggested a high benefit–cost ratio (1.77), but it did not account for all the public costs and was not subjected to statistical testing.

A Honduran small-scale public program to provide privately contracted extension services to groups of farmers has been evaluated by Hanson, Just, and Lainez (2006). Similar to the NAADS program, the service provider contracts are not drawn directly between the farmer group and the provider, but in the Honduran case representatives of each group were interviewed at the end of the season by program officials to assess client satisfaction. The overall rates of return on operations in two geographical areas were 8 percent and 10 percent, with a number of arbitrary assumptions on the profile of benefits over time. It is not clear whether the overhead costs of the program administration were included in the calculation.

Farmer field school programs have been the focus of quite a few empirical studies (Feder, Murgai, and Quizon 2004a, 2004b; Godtland et al. 2004; Tripp, Wijeratne, and Piyadasa 2005; Ricker-Gilbert et al. 2008), and extensive literature reviews citing such studies are available in Davis (2006) and van den Berg and Jiggins (2007). The studies are too numerous to review here, but our conclusion is that the results are mixed. Some of the positive results claimed are based on inadequate econometric analysis that does not properly account for selection biases. Insufficient attention is given to the full cost of the training, which tends to be higher (per farmer) than less-intensive extension methods. It has also been noted that diffusion of information between trained farmers and other members of the community is problematic due to the detailed and experiential nature of the training, as highlighted by Braun et al.

(2006, 39): “This [limited diffusion] leaves open the question how the beneficial impact of FFS on participating farmers can be scaled up beyond the relatively small numbers that can be reached directly through FFS. . . . The experience so far is that too many key characteristics of the FFS erode during mass replication for the benefits to be sustained.”

The NAADS program in Uganda, being one of the largest national CBE programs, has been studied by many, although only two studies undertook a rigorous econometric analysis based on a sufficiently large sample. A study by Benin et al. (2007) relying on a 2004 survey of 894 households suggests that the program had a significant and positive impact on the adoption of new crop and livestock enterprises (vanilla, groundnut, goats, bees), modern technology, and postharvest technologies. However, the results do not indicate significant differences between NAADS and non-NAADS subcounties in crop yields or total (crop and livestock) income, although they suggest that farmers in NAADS subcounties avoided some of the large drops in crop income experienced by those in non-NAADS subcounties. A serious limitation on the robustness of the result is that the study does not systematically account for the possible selection bias whereby the subcounties covered by NAADS are different from those not selected for inclusion in the program. Another drawback is the estimation of income and consumption changes on the basis of respondents’ recall over a five-year horizon.

Another study of NAADS impact, based on a more limited sample of households interviewed in 2005–2006, attempts to tackle selection bias through an instrumental variable procedure (Muwonge 2007). In one of the specifications (that actually relies on ordinary least squares regression), the study estimates that NAADS participation increased the value of farm production by 18 percent, but the result may not be robust as it is statistically significant only at the 90 percent confidence level. It is noteworthy that once instrumental variables are used, extension impact is not significant. The author rejects the instrumental variables specification on the grounds that there is no indication of an endogeneity problem, but this conclusion is most likely due to the choice of weak instrumental variables (none of which is at the household level).

A study conducted at the pilot phase of the ATMA program in 28 project districts suggested that the reformed extension system contributed to increasing farm income and rural employment through agricultural diversification. During a four-year period (1999–2003), the horticultural cropping area increased from 12 to 16 percent; oilseed crop area increased from 3 to 11 percent; and the crop area for herbs, medicinal, and aromatic crops increased from 1 to 5 percent. During this period, the area planted to cereal crops (primarily wheat and rice) declined from 55 to 47 percent, but yields increased 14 percent, resulting in no appreciable loss in the production of staple food crops. During this period, average farm income across the 28 pilot project districts increased 24 percent, in contrast with only 5 percent in nonproject districts (Tyagi and Verma 2004). The analysis may have inadequately tackled selection biases and baseline advantages of some of the program districts, and thus the attributions may entail an overestimate. The scaled-up program that expanded the ATMA model to the national level has not been evaluated rigorously, but it is perceived to be floundering: Sulaiman and Hall (2008) attribute the difficulties to numerous implementation challenges, including insufficient support; mismatch with diversity of application contexts; lack of local ownership; and capacity and institutional constraints. Swanson (2009) agrees with the assessment of the poor status of the national program, but argues that the key problem is insufficient resources to invest in training extension staff in the Indian states in participatory methods.

A study of the impact of the Indonesia Decentralized Agricultural and Forestry Extension uses a panel sample of program participants and nonparticipants to infer impact on income and other performance criteria (Bourgeois and Kusumaningrum 2006). The study, which is afflicted by a number of data and methodological issues, produced numerous mixed results, and curiously it indicated no project impact on agricultural incomes but some impact on nonfarm income. The results are summarized by one of the authors as follows: “There is no clear indication that the Participatory Action and People Participation method directly . . . improved the welfare of rural people. Field research indicated that provision of inputs and services to target groups was not constant over the project’s time frame (five years). But still the project provided some benefits for the farmers, including better knowledge in how to

acquire resources; learning how to make proposals and how to discuss and decide together about priorities” (Kusumaningrum 2007, 1).

The few cases reviewed here serve to highlight the need for cogent quantitative analysis of extension schemes of different types but especially CBE variants.

5. CONCLUSION

The belief that farmers can use improved information to advance their productivity and profitability as well as contribute to higher rates of agricultural and economic growth and poverty reduction is widely held and has been a key rationale for agricultural extension being an important element of agricultural development strategy for decades. But the validity of this belief has come under increasing scrutiny in recent years as evidence of less than satisfactory experience has been accumulating in the developing world as well as among the agencies that are engaged in assisting national efforts.

We began our review by examining the conceptual underpinnings of community-based extension approaches, whereby users of agricultural extension services are empowered, usually through their community structures such as farmers' associations (of varying degree of formality of constitution) or other associations that bring people together over shared interests, to influence what is attempted and how it is achieved in such service systems. The organizational structures represent vehicles for bringing social capital and engaged linkage to help in the delivery of information and other services that can be provided through advisory endeavor. The key rationale in pursuing such approaches is to overcome the theoretical and practical challenges inherent in the design of traditional public extension models, typically conducted by agencies located within a ministry of agriculture. The essence of the community-based, or demand-driven, approaches is to make extension workers accountable to the users of the services, and to enable beneficiaries to articulate well their needs and get them attended to by extension providers and more directly to be aware of and reactive to the effectiveness of delivery. Since user beneficiaries may not be fully conscious of the opportunities available, there is an element of faith or hope (bolstered by appropriate institutional design and implementation) that the providers will indeed be able to deliver cogent information in timely and effective manners.

In light of Hayami's (2009) insights on community failures, it should come as no surprise that the reality of recent experience with CBE approaches to delivery of agricultural advisory services, as reviewed in the final section, finds them to be somewhat lacking in terms of having successfully overcome all the problematic features of extension delivery in the past. In the unfortunately rather few cases where performance has been relatively carefully studied, we find that elite capture constitutes a major constraint. The experience has not been much better in having the empowered farmer beneficiaries be successful in setting the extension agenda and "supervising" delivery of desired services. For instance, articulating farmers' priorities and getting them into extension work programs was a central design feature of NAADS in Uganda, but that was seriously compromised in implementation both because of influences that might be called political and because of bureaucratic constraints on devolving authority to the village-based farmer group. The experience with the pilot phase of the ATMA model in India in this respect may have been better, perhaps because of the greater number of checks and balances incorporated in the arrangements for ATMA governance combined with proper training of staff involved. The disappointing experience of the same model at the scaled-up phase points out that the conclusions derived from a relatively small (in the Indian context) pilot cannot be simply extrapolated.

A related aspect of farmer empowerment is in implementing farmers' control of service providers' contracts. This is evidently an aspect that requires considerable administrative imagination and novel mechanisms that have as yet not been forged effectively, given the experience overviewed in Section 4. Part of the challenge for CBE derives from the problem, often encountered in developing countries, of a chronic shortage of competent potential service providers. The important role for public investment here is largely one of providing resources and mechanisms for training cadres of extension workers with relevant skill mixes, not an easy thing to do with the educational facilities available in many countries.

Altruism extends only so far in service delivery of any sort. With the frequently experienced problems of timely availability of adequate funds to support CBE activities as desired and demanded by community or farmers' groups, there have been many frustrations in the studied CBE endeavors. Such difficulties have plagued the traditional publicly delivered extension services of recent decades, but to the

extent that CBE is dependent on such flows of public resources, especially those coming down from national budgets, these realities are just as damaging, in terms of efficient public spending, for CBE-type delivery systems.

Top-down thinking is hard to shake off by those accustomed to its lures, or so it seems in the cases studied. Deep-seated cultural attitudes are surely important features of the challenge of effectively empowering farmers and changing mind-sets of extension workers ostensibly working on their behalf. To summarize these various challenges reviewed in this chapter, CBE, in spite of its promise, is no panacea. There are important knowledge gaps yet to be filled, as transpires from our review of the limited econometric evidence, to inform the public debate on investment in agricultural extension. Thus, we conclude our review with the inevitable academic call for further research in this surely important area of investment for agricultural and economic development. Yujiro Hayami's work on social capital and communities can guide this field of research as it provides an insightful perspective for analyzing the potentials and limitations of the community mechanism in agricultural development—limitations that must be recognized more realistically, and potentials that must be exploited more creatively!

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