FARMERS' ORGANIZATIONS AND AGRICULTURAL INNOVATION

Case studies from Benin, Rwanda and Tanzania

Bertus Wennink and Willem Heemskerk (eds.)

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Executive summary

Context and background

Since the 1990s Sub-Saharan African countries have embarked on major agricultural sector reforms, which led to changing and innovative roles for the public and private sectors as well as civil society organizations. Farmers' organizations (FOs) now increasingly voice the needs of their members in various fora on policy-making and orienting service provision. They are solicited by the private sector to enhance chain development, including those for new markets, and they play a role in local development planning. FOs are now, more than ever, actively involved in agricultural development, which requires institutional, organizational and technological innovation in order to be successful. Providing user-oriented research, extension, and training services is therefore a prerequisite for technological innovation. Institutionalizing participatory methods, decentralizing services, creating multi-actor platforms and multi-stakeholder driven funding mechanisms all enhance demand-driven agricultural services. The private-sector and/or public-private arrangements currently play an increasing role in research and extension. FOs are thus evolving in an environment where stakeholders' interests diverge and/or converge. However, the effective use of new technologies to become innovations is often defined by conditions other than simple access to knowledge and information; it often requires appropriate, innovative institutional and organizational settings. The agricultural innovation systems concept therefore considers links between actors, interactive learning processes, and the policy and institutional contexts that govern the system in order to better understand the generation, dissemination and application of knowledge. The agricultural innovation systems concept also emphasizes the need for all stakeholders to work together towards innovation for development.

Research and extension organizations have moved from working with individual farmers to collaboration with groups and, increasingly, with farmers' organizations. At the grass-roots level, farmers' associations, producers' groups and cooperatives, as well as specially created farmers' groups, are all involved in research and extension activities. At higher levels, unions, federations and syndicates are implicated in multi-stakeholder platforms for planning research and extension services. Nowadays FOs present a highly diverse picture: from the former, state-managed, cooperative societies and unions to the new, farmer-initiated federations and syndicates, as well as market-driven farmers' groups. As a consequence, links with public and private knowledge-for-innovation

service providers are encountered at all levels, with various status, aims and function modalities. But the role of FOs in agricultural innovation goes much further than simply participating in, and contributing to, research and extension. Support functions, such as guiding innovation processes (e.g. information on norms, regulations and markets), sharing experiences for learning purposes, providing complementary services (e.g. credit facilities) are equally important. FOs can therefore fulfil several roles, contribute to various functions that enhance successful innovation and increasingly provide services themselves.

Case studies

This bulletin analyzes the roles played by FOs in agricultural innovation using the innovation systems concept and investigates the constraints that hamper them from playing their role to the fullest extent. Case studies were therefore conducted, in partnership with farmers' organizations, as well as research, extension and training institutions in Benin, Rwanda and Tanzania. The case study approach also highlighted a number of best practices and lessons learned. Finally, research findings allowed the teams to identify the main issues for strengthening the role of FOs in agricultural innovation systems.

The first Benin case study focuses on FUPRO, the national federation of village farmers' groups and associations, district and provincial unions. These are key actors in the Benin cotton sector and were created with assistance from the public sector services, which previously managed this strategic sector. Cotton-sector reforms resulted in a more prominent role for FUPRO in orienting agricultural research and development (AR&D) services within the cotton sector. FUPRO participates in a national private-sector platform that allocates resources to public-sector cotton research and agricultural extension through a central fund, which is derived from cotton levies. Both producers and ginners agree on the percentage of the market cotton price that is donated to this fund. At the provincial and district levels FUPRO member organizations have strong, historical relationships with public-sector services and are developing relationships with the private sector, but without any functional multi-actor platforms. These relationships still focus on receiving knowledge-for-innovation services rather than orienting these services around members' needs. The knowledge services provided are mainly oriented towards inputs such as cottonseeds, fertilizers and pesticides, with an increasing role for the private sector. Cotton producers therefore consider innovation to be driven by the national cotton research institute and the private sector, both of which have up-to-date information on international trends and markets. The fact that cotton levies (to which producers indirectly contribute) are used to fund research and extension is insufficiently exploited by FUPRO and its member organizations to make their members' point of view weigh more heavily in decisions taken. More content-oriented, decentralized platforms are required in order to prepare the decision-making on funding by the national platform.

The second case study in Benin concerns two FUPRO member district unions (UCPs): one in Kalalé district (in an important cotton-producing region of

northern Benin), another in Boukoumbé district (in the northwest), and a cashew growers' district union (ACooBéPA) in central Benin. The two cotton producers' unions receive management support from FUPRO, while the cashew growers' union is assisted by a national NGO, which is paid for the support services it provides by a donor-funded agricultural diversification project.

Cotton producers' unions have strong relationships with the district extension services, which provide management assistance, despite the official policy of transferring this assistance to FUPRO. Extension focuses on new cotton inputs (especially pesticides), which are provided by the private sector. Working relationships with the district extension service depend on the financial resources of the cotton producers' union. The Kalalé union contributes financially to the extension services but without actually orienting these services, even now that the majority of district extension agents are paid through centrally collected cotton levies. Both the Boukoumbé union and the extension service are much 'poorer'; the latter hardly benefits from newly recruited extension agents since the region produces much less cotton. They therefore cooperate on a more 'closed purse' basis. In both the northern/north-western and central regions of Benin, the cotton producers' provincial unions (of which these district unions are members) participate in regional platforms for planning agricultural research, but representation and accountability are poorly organized and information rarely circulates at the district level.

With respect to the cashew growers' union (ACooBéPA), research and extension services are managed by the project itself. The project management unit has a research contract with the national agricultural research institute to develop technologies that are then disseminated by agents from the NGO. Research issues are identified during the project formulation phase and are updated without institutionalized participation by the cashew growers' union. NGO extension agents provide training-of-trainers services to selected union members. Contrary to cotton producers, indigenous knowledge remains a source of innovation for cashew growers; it is only over the past few years that formal research (with financial support from the project) has received a new impulse for dealing with cashew-growing issues. Technological innovations have spread rapidly, with the help of trained cashew growers and their local networks.

In all three district unions, members feel that relationships with service providers should evolve and be based on a more client/user service-provider relationship, which also has implications for the mission and skills of the technical staff. However, both cotton and cashew producers emphasize that their unions were created to improve access to markets, which remains according to them a prerequisite for actual innovation.

The Rwandan case study covers the potato production and marketing chain in the northwest region of the country in investigating the role of IMBARAGA, a national farmers' syndicate, and ROPARWA, a national network of FOs and NGOs. In the post-conflict period FOs and NGOs took the lead for improving input supply, research and extension services for potato production, and by

organizing the marketing of potatoes. Farmers operate in cooperative structures, and storage facilities were built to organize multiplication of improved (registered) seed potatoes, to improve access to other inputs and to facilitate the marketing of potatoes. Building on the rich Rwandan tradition of farmers' associations, IMBARAGA assisted potato-producing associations to form federations that lobby for their interests and negotiate with the private sector. In cooperation with public-sector services and local NGOs, IMBARAGA facilitated farmer participation in research and extension. Researchers are encouraged to conduct on-farm research, while extension agents train farmers to conduct farmer-to-farmer extension. In its approach to AR&D IMBARAGA combines the chain and community approach when organizing knowledge-for-innovation services: through their participation in platforms with other chain actors, federations are informed about market demands, and farmer extensionists embed knowledge transfer into a local community context. However, funding remains the main challenge to sustain these initiatives. Another challenge concerns lobbying for laws and regulations that allow producers to participate fully in multiplication of improved and registered seed potatoes, since the supply through public services remains a problem.

A DRT (Department of Research and Training) paper on the agricultural sector policies for empowering farmers and their organizations precedes the Tanzanian case studies. Building on recent experiences, the paper presents the main orientations for real farmer empowerment, and focuses on agricultural innovation. Farmer fora are being established at ward, district and national level and are empowered to procure and contract services. Existing FOs play a role in innovation by linking community-based farmers' groups into larger networks (i.e. MVIWATA and MVIWAMO experiences) and by representing their members in decision-making platforms on agricultural service provision. Tanzania has a wide variety of farmers' groups at the community level, through both farmer-led initiatives and development projects. However, not all these groups are genuine, or registered, and are not sustainable without external assistance, while service providers increasingly seek collaboration with farmers' groups but do not have sufficient background information about them. Networking capacities allow these farmers' groups to be strengthened and thus become key partners for innovation. Although farmers are represented in local research and extension committees, farmers' representatives have little influence and often merely represent themselves. Farmers' representatives need to be replaced by representatives from FOs in order to enhance downward accountability. Appropriate information and funding mechanisms, for example, will strengthen FOs to better articulate their problems and needs. In line with the bottom-up approach for strengthening farmers' groups and networks, participatory planning, monitoring and evaluation will also be organized, initially from the village, then the ward and district levels.

The first Tanzanian case study concerns MVIWATA, which is the first farmer-led network with a national coverage. MVIWATA links local farmers' groups in networks at different levels to enhance farmer representation and advocacy. Community-based farmers' groups, whether organized via MVIWATA (or other)

assistance, form the building blocks and focus on self-reliance and collective action. Through training on leadership and communication they are now capable of defending their members' interests and building partnerships with service providers supplying a wide range of services. MVIWATA is increasingly involved in representative bodies and, to some extent, in service provision. MVIWATA considers (technological) innovation to be successful only when farmers have access to services such as input supply, credit facilities and marketing. The local farmers' groups also form the main element for managing knowledge and information for innovation: they are trained to network with community members and other farmers' groups and to include indigenous knowledge when participating in (formal) research activities. Furthermore, in cooperation with other institutes, MVIWATA actively disseminates information on best practices in technological (agricultural practices), institutional (relations with service providers) and organizational (group dynamics) innovations by publishing information and broadcasting via radio programmes. Farmers' institutions are now being increasingly recognized as a 'capital' for agricultural innovation. Despite MVIWATA's efforts in knowledge and information services to its members, the overall poor quality of the communication infrastructure remains a major constraint. The lack of market opportunities for farmers remains another significant obstacle to agricultural innovation.

The second Tanzanian case study focuses on MVIWAMO, a relatively young, member district network under MVIWATA that aims to assist farmers' groups in networking activities. Farmers' groups are community-based and their joint activities therefore have an out-scaling effect on the community. These groups are also trained in participatory assessment of problems and identifying solutions that lead to a wide range of services being provided to members. Promoting agricultural (technological) innovation is achieved by organizing thematic workshops, visiting community farmers who are successful innovators, and by organizing exchange visits both inside and outside Tanzania. The effectiveness of these visits for the community is monitored through a learning approach, with the farmers' groups involved and their network meeting on a regular basis to discuss their successes and failures. Although farmers' groups play an important role in agricultural innovation, the extension services provided to members, access to input supply and credit facilities, and marketable crops and livestock products are all conditions for successful innovation. Therefore MVIWAMO encourages networks to organize complementary services to their member farmer groups. Openness of (public and private sector) services for collaboration and functional district-planning and communication fora are therefore required.

Research findings

The case studies show that FOs operate in the changing context of an increasingly pluralist service provision sector, in which the public-sector research and extension institutions are being deconcentrated and the private-sector service providers (e.g. enterprises, NGOs, and farmers' organizations)

are developing a market share. FOs are also increasingly valued for representing social capital that is crucial for the necessary transformation of the African agricultural sector. However, the way in which FOs seize these newly created opportunities are determined by their origin and history. According to the nature of the investments used to build the organizations and the types of links that are being pursued by the FOs, three types of farmers' organizations can be distinguished:[1]

i 'Old' commodity-based FOs (i.e. FUPRO Benin and its member unions, but also out-growers associations) have been created through the initiative of (and with assistance from) parastatals or private enterprises. They have established contract-type relationships with private enterprises for input supply and marketing of produce. Innovation is mainly technological and oriented by the commodity market and the private sector.

ii 'New' market-oriented FOs with 'collaborative' relationships (i.e. ACooBéPA Benin and IMBARAGA-affiliated potato producers' federations) seek to develop collaboration with chain actors, using assistance from externally funded projects and/or NGOs (which often initiated the creation of the FO). Innovation remains technological if the project and NGO manage relationships (i.e. Benin case) but becomes institutional (i.e. Rwanda case) when both NGO and FO clearly aim to build sustainable institutions.

iii Service-system-oriented and network FOs (i.e. MVIWATA and MVIWAMO in Tanzania, but also IMBARAGA in Rwanda) emphasize self-reliance by promoting community-based farmers' groups that are also part of larger networks. Through collective action (social capital) and participating in local fora, they establish partnerships with other actors for service provision in various areas (information and training on technologies, credit and savings schemes, etc.). Innovation has a rather organizational and institutional character as a prerequisite for technological innovation.

The case studies demonstrate that FOs currently access various sources to gain knowledge and information from both the public and private sectors, and use those that are most appropriate to them. However, new links are not always formalized. In all cases, 'private goods' and related knowledge and information, such as agricultural inputs (seeds, fertilizers, pesticides, etc.), are increasingly seen as private-sector business. This compels public organizations to redefine their role in relation to the private sector; the latter often only serves part of the farming community. All FOs contribute to the so-called support functions within the agricultural innovation system, e.g. input supply, credit and savings schemes, and marketing of products. Farmers consider these services to be crucial for (technological) innovation. FO contributions to the so-called basic functions (research and extension) vary according to the type of organization involved. Commodity-based and market-oriented organizations studied consider research and extension as belonging to other institutes and organizations from both the public and private sectors. These are the main drivers behind innovation, despite the fact that the resource base, particularly of the commodity-based organizations, allows services to be oriented according to

[1] Adapted from Bingen and Rouse (2002) and Bingen et al. (2003).

their membership's needs. However, service-system-oriented organizations play a much more active role in knowledge and information services, but in turn lack resources (and thus power) to set the agendas of these service providers.

The case studies allowed researchers to identify best practices and lesson learned in several areas, e.g.:
- farmer experience-based and evidence-based policy-making;
- sharing knowledge-for-innovation;
- guiding the innovation process by integrating production and marketing chain-oriented and community-based approaches; and
- coordinating complementary (support) services at the local level.

Experiences indicate that FOs can play an important role in sharing knowledge-for-innovation by initiating multi-actor platforms for interactive learning and by implementing joint activity programmes (including use of the media) with extension services on a cost-sharing basis. A major challenge facing FOs is to develop sustainable funding mechanisms for these (farmer-led) initiatives.

Strengthening the role of FOs

The following key elements need to be considered when attempting to strengthen the role of FOs in agricultural innovation, i.e. the:
- policy environment and institutional context (notably the integration level of farmers and their organizations into markets);
- assets and needs of the organization's membership base; and
- type of FOs involved.

Agricultural innovation is an interactive, multi-actor process that cannot be achieved by farmers alone. It requires not only links but also alliances between FOs and other institutions. Knowledge of these key elements therefore allows:
- defining the roles of public and private sector knowledge-for-innovation service providers;
- designing appropriate funding mechanisms to underpin these links and enhance the farmer-led and demand-driven services; and
- determining the innovation perspective (technological, institutional and/or organizational).

Several challenges emerged from the case studies with respect to empowering farmers and their organizations in general, and agricultural innovation in particular. AR&D issues, which are usually limited to technological constraints and priorities, should be seen in the wider context and accepted as such by other actors in the innovation system. This allows FOs to identify key services and service providers, besides research and extension, necessary to achieve successful innovation. FOs are increasingly being solicited to participate in planning (priority-setting and resource allocation) for service provision, but the mission statements formulated by many FOs and the specific skills of their representatives need to be developed further in order to increase effective participation. Furthermore, participation in services needs to go beyond

planning and include monitoring and assessment of services provided, particularly since FOs themselves are starting to provide these services to their members and other farmers.

Appropriate funding mechanisms that enhance effective participation in decision-making processes remain crucial when designing service systems. This also evokes the challenge of enlarging the resource and power base of FOs to make them less dependant on external funding and more sustainable. More important than identifying AR&D issues is the orientation of the innovation process itself: the final objective, the drivers and the innovation triggers, plus the key actors that need to be involved. This also calls for developing capacities and skills of FOs in areas such as:

- participatory and evidence-based policy-making;
- formulating comprehensive strategies for (technological) innovation; and
- designing multi-actor institutions for interactive learning.

Operational communication and knowledge/information management within FOs remain major challenges to enhancing organizational learning. Finally, equitable representation, social inclusion, upward participation and downward accountability within FOs are recurring issues for which strong community-based farmers' groups remain an essential prerequisite.

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Foreword

Since the 1980s, farmer participation in agricultural knowledge services such as research, extension and training has been a key issue. From about 1980 onwards the Royal Tropical Institute (KIT) has been involved in developing methodologies for enhancing farmer participation (e.g. the farming systems approach and village participation in rural development), together with national agricultural research and extension organizations, particularly in Sub-Saharan Africa. In the late 1980s KIT gradually started supporting programmes for institutional development and capacity building of national agricultural services organizations. These programmes helped change these organizations to become more competitive and introduce both quality-based and result-based management methods to respond more effectively to what service users and farmers needed, for example through the 'Client-Oriented Research Management Approach' (Heemskerk et al., 2003). In these programmes, empowering farmers' organizations (FOs), which represent a major user group of research and extension services, proved to be crucial in realizing the shift from research (essentially generating knowledge) to innovation (developing as well as applying new knowledge).

The aforementioned approaches were underpinned by the 'social organization of innovation' rather than a sole 'transfer of technologies' concept. Instead of knowledge originating mostly from researchers directly, both supply and demand for knowledge are now originating from a variety of sources and have made innovation a much more dynamic and complex process. Under the influence of democratization, liberalization and privatization, the demands on research and extension services have been opened up to the private sector as well as to FOs. Effective Agricultural Innovation Systems (AIS), with their main functions of generating, disseminating and applying knowledge, require important roles to be paid by the public and private sector, as well as by FOs. However, the specific roles of these players can evolve under changing conditions (e.g. improved access to markets for farming households). FOs can play a key role in innovation by representing the main rural actors, i.e. they can voice farmers' constraints, problems and needs; orient knowledge services towards the requirements of their members (or even provide services themselves); provide an information and communication network; and claim favourable policies for innovation and the broader development of the rural sector.

In 2003 KIT started systematizing and deepening its knowledge concerning the role that FOs play in AIS; this comprised a literature review as well as

exploratory surveys together with partner FOs in Tanzania and Benin (Heemskerk and Wennink, 2004a). A review of KIT experiences, as well as those of partner agricultural research and extension organizations with private-sector participation in public agricultural research and extension, allowed key issues for future research on this subject to be identified (Wennink et al., 2004). The results of these two studies contributed to the formulation of a four-year action-research programme that focuses on multi-stakeholder management of agricultural innovation and, more particularly, on the role of FOs. This action-research programme aims to contribute to developing demand-driven services for agricultural innovation in rural and peri-urban areas as part of poverty-reduction strategies. The overall approach is to conduct research in partnership with local organizations (FOs, research and extension services, knowledge institutes, etc.) that support these partners in finding appropriate solutions to improve their roles and contribution to agricultural innovation. This bulletin presents the results of a series of case studies conducted in Benin, Rwanda and Tanzania on the role of FOs in AIS as a basis for identifying best practices and lessons learned. By publishing this bulletin KIT aims to nurture the ongoing debate among policy makers about more effective and efficient AIS and to provide practitioners with guidelines. The outcome of this study, in terms of more effective approaches to agricultural innovation, will also be used to prepare a set of guidelines that will be made available through KIT training manuals and modules.

Acronyms and abreviations

ACooBéPA	*Association des Coopératives Béninoises de Planteurs d'Anacardier*
AFD	*Agence Française de Développement*
AIC	*Association Interprofessionnelle du Coton*
AIS	Agricultural Innovation System
AKIS	Agricultural Knowledge and Information System
AKSCG	Association of Kilimanjaro Speciality Coffee Growers
APVC	Agricultural production-value chain
AR&D	Agricultural research and development
ASDP	Agriculture Sector Development Programme
ASDS	Agriculture Sector Development Strategy
ASLM	Agriculture Sector Lead Ministries
AMSDP	Agricultural Marketing Systems Improvement Programme
ASP	Agricultural service provider
BAIR	*Bureau d'Appui aux Initiatives Rurales*
BOAD	*Banque Ouest Africaine de Développement*
CDD	Community Development Department
CDTI	Community and Development Training Institute
CeCPA	*Centre Communal pour la Promotion Agricole*
CeRPA	*Centre Régional pour la Promotion Agricole*
CG	Contact group
CIRAD	*Centre de coopération Internationale en Recherche Agronomique pour le Développement*
CPE	*Centre Permanent d'Expérimentation*
CRA	*Centre de Recherche Agricole*
CRA-CF	*Centre de Recherche Agricole – Coton et Fibres*
DAC	District Advisory Committee
DADP	District Agricultural Development Plans
DEDRAS	*Organisation pour le Développement Durable, le Renforcement et l'Auto-promotion des Structures communautaires*
DRD	Department of Research and Development
DRT	Department of Research and Training
EAFF	East African Farmers Federation
EZCORE	Eastern Zone Client-Oriented Research and Extension
FEG	Farmer extension group
FFS	Farmer field school
FG	Farmer group
FO	Farmer organization

FOR	*Forum des Organisations Rurales*
FRG	Farmer research group
FUPRO	*Fédération des Unions des Producteurs du Bénin*
GDP	Gross Domestic Product
GoB	Government of Benin
GoR	Government of Rwanda
GoT	Government of Tanzania
GV	*Groupement Villageois*
ICRA	International Centre for development oriented Research in Agriculture
IFAD	International Fund for Agricultural Development
IFAP	International Federation of Agricultural Producers
INADES	*Institut Africain pour le Développement Economique et Social*
INRAB	*Institut National des Recherches Agricole du Bénin*
IPR	Internal Programme Review
ISAR	*Institut des Sciences Agronomiques du Rwanda*
KIT	Royal Tropical Institute
KNCU	Kilimanjaro Native Cooperative Union
LADP	Local Agricultural Development Plan
LGA	Local government authorities
LTI	Livestock Training Institute
MAFS	Ministry of Agriculture and Food Security
MCM	Ministry of Cooperatives and Marketing
M&E	Monitoring and Evaluation
MVIWATA	*Mtandao wa Vikundi vya Wakulima Tanzania*
MVIWAMO	*Mtandao wa Vikundi vya Wakulima wa Wilaya ya Monduli*
MWLD	Ministry of Water and Livestock Development
NAADS	National Agricultural Advisory and Development Services
NAEP	National Agricultural Extension Project
NARF	National Agricultural Research Fund
NARS	National Agricultural Research System
NGO	Non-Governmental Organization
NIS	National Innovation System
PADEP	Participatory Agricultural Development Programme
PARCOB	*Projet d'Appui à la Recherche Cotonnière du Bénin*
PELUM	Participatory Ecological Land Use Management
PNAP	*Programme National d'Amélioration de la Pomme de terre*
PO	Producer organization
PPP	Public-private partnerships
R-D	Research-Development
RDS	Rural Development Strategy
ROPARWA	*Réseau des Organisations Paysannes au Rwanda*
ROPPA	*Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest*
RSAD	*Responsable du Service Agricole du District*
SACCO	Savings and Credit Cooperative
SNS	*Service National des Semences*
SUA	Sokoine University of Agriculture

TACRI	Tanzania Coffee Research Institute
TARP	Tanzania Agricultural Research Project
TCGA	Tanganyika Coffee Growers Association
UCP	*Union Communale des Producteurs*
UDP	*Union Départementale des Producteurs*
ZAEC	Zonal Agricultural Executive Committees
ZARFMT	Zonal Agricultural Research Fund Management Team
ZARDI	Zonal Agricultural Research and Development Institute
ZEC	Zonal Executive Committee
ZTC	Zonal Technical Committee

1 Introduction

1.1 Context

Over the last decade of the 20th century the agricultural sector in Sub-Saharan Africa has undergone fundamental reforms that create both opportunities and challenges for farmers to organize themselves and operate as organized entities within the agricultural sector. The ongoing democratization of political systems gives room for public debate, creates space for a clearer expression of citizens' demands and gives a more active role to civil society organizations. At the same time, participation by the civil society organizations contributes to democratization processes by empowering citizens in their relationship with the state. Farmers' organizations (FOs), whether formal or informal, have always played a role in the relationships between the state and rural society, though over time their roles have changed considerably. In colonial days the FOs (as market organizations) dealt with private enterprises, often without any direct interventions by the state, but in post-colonial days they became an instrument for the state to pursue its aims and mostly evolved into top-down managed organizations, while in the post-cold-war days FOs are converting to more bottom-up management, within the context of democratization and decentralization (Ela, 1990; Moyo, 2002). Organizing themselves around common interests and pooling their resources is a way for farmers to become real partners in rural development. FOs can then be consulted by the state and become participants, instead of just remaining an instrument for implementing state policies.

The increasing liberalization of national economies in Sub-Saharan Africa, and worldwide, opens up both national and international markets, and gives a more prominent role to private enterprises in input supply, service provision and marketing. The private sector traditionally considers FOs as trustworthy partners for enhancing the cost-effectiveness of operations through economy of scale. At the same time, this offers opportunities for farmers, processors and their organizations to establish links with private enterprises and gain better access to markets. Withdrawal by the state from providing goods and services and further privatization also creates possibilities for FOs to become service providers themselves, or share in the costs of service provision (Chirwa et al., 2005; IAC, 2004). Liberalization poses several challenges for FOs to:

- become capable and strong actors in shaping market relations;
- organize support services that allow members to access these markets; and
- avoid exploitation of their members, by preventing a 'divide and rule' private sector.

Decentralization and deconcentration of public services help devolve decision-making to the local level and give a prominent role to local institutions, including FOs. Development policies increasingly take account of local conditions and enhance ownership by local actors. In many African countries decentralization of governance turns local, district and regional governments into stakeholders in orienting service provision. This is considered essential for accelerated local development where elected local governments are accountable to their constituency (Ribot, 2002). Decentralization and deconcentration are processes that allow for stronger voicing of farmers' needs and the establishment of more demand-driven and accountable services. FOs certainly matter in these processes, since they represent a considerable part of the local government's rural constituency. At the same time, advancing local development also implies mobilizing financial resources, for which local governments increasingly solicit FOs.

The reform processes also result in an ongoing revision of the roles played by central and local administrations, public and private service providers, and rural society organizations, including non-governmental organizations (NGOs). These ongoing changes provide opportunities for FOs, but they also face the challenge of dealing with the other stakeholders in agricultural development, which have both complementary and conflicting interests (see Table 1.1).

Policies to increase agricultural productivity play a central role in poverty-reduction strategies. Agriculture is an important income source for rural households and thereby contributes to sustainable financing of social-sector services in rural areas (Irz et al., 2001). Innovation, essentially a beneficial change of practices and processes, plays an important role in developing agriculture as a sustainable basis for economic growth and income generation for rural households. Developing new technologies is considered to be a trigger for improving the incomes of farmer households and is at the basis of some major successes in Sub-Saharan African agriculture (Gabre-Madhin and Haggblade, 2001). Agricultural research and extension are key services for innovation – either public or private service providers can provide these, including farmers or FOs (known as 'formal' and 'informal' research and extension respectively). Knowledge is generated, made accessible as information and disseminated/shared through networks to help boost agricultural productivity. FOs are active partners in all stages of this process, as innovation emerges through interaction rather than the imposition of technology.

Public research and extension services increasingly focus on poverty alleviation through enhancing income generation. They adopt a wider livelihood perspective and integrate market-oriented thinking into their approach. They therefore need to provide information ranging from improved production technologies to enhanced opportunities for market access. In Sub-Saharan Africa, state financial support to the public sector is becoming increasingly constrained. The public agricultural service providers therefore increasingly function on a demand-driven basis to ensure effective service provision and to generate revenues. In this new setting, clients and users (including FOs), define their needs,

Table 1.1: The interests of various stakeholders in FOs

Stakeholders		Farm households	Private enterprises	NGOs	Public sector
Specific areas of interest by stakeholders in FOs	Overall interests	Improved livelihoods	Increased profits, quantity and quality supply of products	Social welfare and sustainable development	Economic growth and poverty reduction
	Policy and decision-making processes	Voicing and enhanced participation		Empowerment and capacity strengthening	Representation for policy consultation
	Access to markets for inputs and products	Improved access to (new) markets	Cost-effective input supply and marketing of (new) products	Provision of market information	Improved market coordination
	Infrastructure development	Infrastructure development			Cost-sharing of infrastructure development
	Access to financial services	Improved access to credit supply and insurance products		Cost-effective provision of credit supply	
	Access to knowledge-for-innovation services	Improved access to, and accountability of, services	Cost-effective provision of information and training services	Cost-effective provision of information and training services	Cost-effective and cost-sharing of service provision
	Risk reduction	Improved access to social services		Cost-effective provision of social services	Cost-sharing of service provision

Adapted from Chirwa et al., 2005.

determine the services to be provided and have to account to their constituency in terms of efficiency and quality. Simultaneously, many private service providers in research and extension are emerging. NGOs often integrate social development objectives into their approaches, while private enterprises link research and extension to the private goods and services that they provide (Chema et al., 2003; Heemskerk et al., 2003; Rivera and Alex, 2004).

Besides formal research conducted by public research institutions, learning from research and experience by farmers or other stakeholders (i.e. informal research) within the sector or the agricultural production-value chain (APVC) is another important source of knowledge and information. Whether or not knowledge is applied (and therefore becomes an innovation) depends on the nature of that knowledge as well as other factors, such as the availability of financial services, facilities for business development, access to markets, etc. In other words, interactive learning and the policy and institutional environment often determine whether or not pure knowledge is transformed into actual innovations. These are key issues in the Agricultural Innovation System (AIS) concept (Hall et al., 2002; Feinson, 2003).

Farmers build on their own experience, learn from other actors, participate in the planning and monitoring of agricultural research and development (AR&D) services, and highlight factors relevant to innovation success or failure. The aforementioned reforms offer new opportunities but also pose challenges for FOs to go beyond technological innovation. This can be materialized through building and strengthening democratically functioning and economically viable organizations, managing their member-based organizations professionally, and partnering with other actors to share and exchange knowledge.

There are numerous types of FOs, e.g. commodity-based or community-based organizations; farmers' groups that focus on attracting outside resources, or self-help groups that rely on community forces; small, local groups or larger network organizations. FOs may operate at national and/or local levels, and may fulfill many functions such as:
- advocating and lobbying for political rights;
- representation on advisory bodies (e.g. district councils);
- providing technical or economic services (e.g. providing input or product marketing for access to local and national markets) to their members; and
- providing support for local development initiatives.

This challenges FOs to form political and service alliances with other FOs or development actors, to effectively establish and link with different organization levels, and to articulate functions according to these levels.

1.2 This bulletin

This bulletin describes and analyzes the current and potential roles of FOs in AIS and focuses on issues such as:
- feeding farmers' experiences into the system;
- directing knowledge-for-innovation services (research and extension) towards the problems and needs of FO members;
- identifying and implementing favourable conditions for agricultural innovation; and
- related capacity reinforcement.

Chapter 2 describes the context in which many FOs presently operate and the background of agricultural innovation; this introduces the case studies conducted by FO staff and members, together with KIT researchers in Benin, Rwanda and Tanzania, which form the centre-piece of this bulletin. Chapter 3 gives a summary of the methods used for conducting the studies and presents the framework for analysing the case study results, based on the AIS concept. The main results of the case studies are then summarized in Chapters 4 to 9. The cases presented concern cash-crop-related, as well as area-based, FOs and different levels of FO operations within the AIS. Chapter 10 presents the main research findings and formulates best practices and lessons learned (based on case study results). Chapter 11 identifies issues for enhancing the role of FOs in the AIS.

2 Background

2.1 Reforms in agricultural research and extension

For over two decades now, agricultural research and extension in many Sub-Saharan African countries have used participatory working methods. As a result, approaches towards research and extension have broadened and, in addition to informing clients and users about technologies, they have also incorporated capacity building of farmer groups in order to:
- adapt and disseminate (new) knowledge and technologies;
- organize processing and marketing operations; and
- manage natural resources;
- coordinate and manage local development projects.

These methodological developments have also broadened the perspective of research and extension beyond just the production and processing techniques per se (Rivera and Alex, 2004). Working relations at several levels are being further institutionalized: with multi-stakeholder decision-making platforms being created as part of institutional reforms. FOs are increasingly considered to be the farmers' legitimate representatives. New funding mechanisms separate operations for both resource allocation (financial and human) and research implementation with subsequent roles for service users (FOs) and service providers (Chema et al., 2003). This last development is also related to a revision of the appropriate roles of the public and private sectors in creating knowledge and disseminating information.

Redefining the roles of the public and private sectors in agricultural research and extension has given a more prominent role to the private sector in knowledge-for-innovation services. The private sector generally focuses on cash crops and income, and addresses farmer households with strong market links. The public sector remains in charge of services concerning food and subsistence crops that target smallholders and areas with weaker market linkages (de Steenhuijsen Piters et al., 2003). The roles of the public sector, private enterprises and FOs in agricultural research for development are related to issues such as: integrating farmer households, FOs and local economies with markets, the appropriate functioning and regulation of these markets, as well as the assets and social capital of farmers and their organizations (Berdegué and Escobar, 2002).

However, few research and extension services are purely public or private, and shifts occur according to circumstances (e.g. degree of market integration, pressure on common natural resources, regulations on intellectual property rights). The general trend is to organize research and extension according to the degree of 'excludability' (possibilities for marketing) and 'substractability' (allowing individual consumption) of the goods and services involved (Chapman and Tripp, 2003). The relationships between the public and private sectors in service provision can take different forms, such as:

- full transfer of responsibility (pure privatization of public-sector organizations);
- contractual relationships (e.g. outsourcing of services); and
- public-private partnerships that underwrite a common goal and share resources (Hall et al., 2003).

These new relationships lead to a separation of the funding, planning and implementation of research and extension services in which the roles of public and private sectors and user organizations change in weight (Chema et al., 2003).

The state's withdrawal from the provision of private goods and services, deepening crises in the availability of public funding and the partial opening of the sub-sector to the private sector, all require public agricultural research and extension organizations to fundamentally change. The reforms focus on multi-stakeholder involvement, performance (oriented towards results or impact), enhanced user responsiveness and generating revenues from clients. Client orientation and demand-driven approaches for service provision are being institutionalized. These approaches are encouraged by new funding mechanisms (e.g. multi-stakeholder managed competitive funds for financing services, cost-sharing of operations through levies on commodities) and are facilitated by decentralizing research and extension systems (Heemskerk et al., 2003).

Decentralization of agricultural research is mainly taking place through deconcentration of research capacity and devolution of decision-making powers to local entities, often with an eco-regional mandate, and to national entities with a sector or programme-based mandate. The main implication of decentralizing agricultural research is a redistribution of the roles relating to the funding, planning and implementation of research between the research organization or centre, the private sector, user organizations (including FOs) and local government bodies. Decentralization also involves reviewing responsibilities for the various types of research: strategic and applied research are mostly coordinated at the national level and organized along the lines of disciplines or commodities, which are considered strategic for the national or rural economy; while adaptive research is managed at the local level and operates according to a systems approach within a given eco-region (Chema et al., 2003).

Managing AR&D is now, more than ever, a multi-stakeholder process where stakeholders' interests may diverge; consequently the needs for innovation vary and sources of knowledge and information are diverse. Research operates in a multi-tiered system and includes links with the extension services, which are

generally weak. Agricultural extension has also undergone decentralization reforms but, whereas the management of research often remains the responsibility of one organization, the management of extension frequently involves several entities and becomes quite complex. Extension systems, more than research, have also integrated private non-profit organizations, including FOs, and are generally more pluralistic (Rivera and Alex, 2004). This also implies a shift in the roles of central line departments, local governments, private enterprises, NGOs and FOs.

2.2 Rethinking agricultural innovation

Innovation and technology dissemination in the agricultural sector used to be organized as a linear and stepwise process: knowledge was acquired and/or generated via research, which was then disseminated by extension services in the form of information adapted to the needs of the end-users and, finally, users were expected to apply this new knowledge. The same pattern is being observed in the organization of research and extension around APVCs, along the lines of operations such as production, processing, packaging and storing. Both approaches, whether 'pushed' by the supply of knowledge or 'pulled' by the demand for information, put researchers at the centre of the innovation process and have a top-down focus on innovation and knowledge to be applied at production and farmer levels (Hall and Yoganand, 2002).

The recent reforms undertaken in agricultural research and extension all seek greater stakeholder involvement to strengthen client and user orientation and demand-driven management in order to enhance the impact of the services provided. In some cases, farmers/processors may even supply these services themselves. Besides the formal, national research and extension organizations of the public sector, private enterprises and FOs are now often increasingly involved in research and extension (e.g. farmers collaborating in planning and implementation of trials and demonstrations, representing farmers on boards, advisory councils, technical committees, etc.). Changes in stakeholder involvement in research and extension also illustrate the changing attitudes towards managing knowledge and information for agricultural development. During the 1990s, in line with this broad reorientation of agricultural research and extension, emphasis was placed on reorganizing the National Agricultural Research System (NARS)[2] by:

- reviewing the roles of the public and private sectors with respect to research;
- linking research organizations with (local, national and international) networks;
- improving the governance of the system (setting priorities, including the needs of farmers and accountability to both farmers and funding agencies); and
- strengthening linkages with extension.

[2] A NARS comprises all a country's organizations and institutions that are responsible for organizing, coordinating and implementing research with the explicit aim of contributing to agricultural development and the maintenance of the natural resource base (GTZ, 2004).

In this concept of promoting innovation through user involvement, FOs are instrumental in achieving economies of scale for adapting and disseminating new knowledge and information. But FOs must also be equal partners in research and extension services if participation is to go beyond consultative approaches.

Within the context of the NARS restructuring process, it became generally accepted that agricultural innovation requires a much more dynamic and complex interaction between stakeholders: roles can shift among participating actors, sources for acquiring and generating knowledge are diverse, and there are multiple networks for disseminating knowledge. The management of knowledge and information became the central issue, according to the newly developed Agricultural Knowledge and Information Systems (AKIS) concept. Effective interaction calls for functional linkages between stakeholders to ensure that knowledge is shared and information flows smoothly. By linking research, extension and training, AKIS aims to promote mutual learning and to generate, share, use and apply knowledge and information (FAO/World Bank, 2000). AKIS clearly allows farmers and their organizations to manage knowledge and information better.

This approach to agricultural innovation recently evolved further, based on industrial innovation studies. Instead of providing a 'blueprint' for designing systems to promote innovation, attention shifted towards understanding and explaining the successful generation and application of new knowledge. In addition to the AKIS focus on interaction and linkages, the National Innovation System (NIS) concept emphasizes learning processes and the socioeconomic contexts that are considered crucial for applying new knowledge, thus leading to actual innovation (i.e. including adoption). Institutional support to facilitate such learning (e.g. learning from others, learning by doing, learning through use) is therefore considered critical. Applying knowledge for development becomes the ultimate aim of the NIS, and puts the users in the driver's seat. However, innovations, particularly technical improvements, often only take place if specific socioeconomic conditions are met. Innovation therefore comprises technical, as well as organizational and institutional developments, also because interaction between actors is embedded in a socioeconomic context (Hall and Yoganand, 2002; Feinson, 2003). In this context (and this bulletin), an Agricultural Innovation System (AIS) is defined as a set of organizations and individuals that are involved in generating, disseminating, adapting and using knowledge and information of socioeconomic significance, as well as the policy and institutional context that governs the way such interactions and processes take place.

2.3 Diversity of farmers' organizations

FOs exist because farmers have recognized the need and benefits of being organized for a particular purpose. Organizations are created through the initiative of the farmers themselves or are the result of outside influences. The latter is particularly true of FOs that were established in centrally planned

economies, or as a means to transfer goods and services from the central to a lower level and thereby obtain lower transaction costs. FOs are membership-based, i.e. they are composed of, as well as run by, farmers themselves. Most FOs used to be strongly rooted in traditional societies; they managed the relationships of their members within the society and mainly focused on redistributing resources (access to land and labour), reducing risks (organized savings and credit associations) and securing the basic conditions for sustainable farming (managing natural resources). However, modern FOs look both forward and outward; their main aim is to manage relationships with institutions outside the traditional society (Rondot and Collion, 2001). FOs that relate to agricultural research and extension are, generally speaking, mostly developed through outside influences and recently established organizations. A slight difference can be seen between 'farmer' and 'producer' organizations. In this context, the term *farmer* refers to persons managing land, labour, equipment, input and knowledge for agricultural production, while *producers* and their organizations are presumed to operate in markets with a commodity-based focus.

The first modern village FOs in Sub-Saharan Africa were created to better organize the production and marketing of cash crops such as tea, coffee and cotton. The trading of these commodities used to be the monopoly of traders or colonial trading companies, which, after independence, were replaced by parastatals[3]. The development of these early FOs under the guidance of state services followed the cooperative model (e.g. primary cooperative societies in Anglophone East Africa and village associations in Francophone West Africa). Membership of these cooperatives was compulsory and their management was controlled by the state. Cooperatives and associations became *de facto* part of the state structures and directly benefited from government support. However, in part due to political patronage and interference, many of these FOs soon became inefficiently managed institutions that later often collapsed under the influence of structural adjustment and economic liberalization (Bosc et al., 2002). But some survived and are currently engaged in reforms to become genuine membership-based organizations that function according to democratic principles. Other village FOs recently emerged through the initiative of farmers themselves, often with support from NGOs.

Four main types of village FOs can be distinguished according to their origins and aims (adapted from Diagne and Pesche, 1995):

- Farmers' and other village interest groups created on the initiative of state services or non-profit private-sector entities; often still evolving under their supervision. They were often created during colonial times or just after independence, with a cooperative-like constitution and possibly a mix of economic and social objectives. They were developed according to prescribed and/or imported models, with outside interference in management. The coffee

[3] Parastatals are enterprises or organizations that are wholly or partially owned by the state. Although they may have a certain autonomy in management, the government defines the composition of the supervisory board and policy guidelines.

growers' cooperatives ('primary societies') in East Africa are an example; once the commodity sector concerned was liberalized and state assistance diminished, most of these groups had difficulties surviving.
- Producers' groups, which were organized by parastatals or private enterprises to handle the logistics for agricultural input supply and the marketing of export-destined cash crop products. They were often created after independence by parastatals that were cash-crop-based but had a rural development mission. These groups initially had economic objectives and were officially recognized. Village cotton producer groups in West Africa are an example; they were considered successful and survived, since revenues were guaranteed through strong market regulation by the state. Over time, such producer groups started integrating community development objectives into their mandate.
- Producers' groups, such as outgrowers' associations, but also FOs initiated with the assistance of externally funded agricultural diversification projects (promoting cash crops other than coffee, tea, cocoa, cotton, etc.), are more recent phenomena of producer groups with an economic objective. Outgrowers' associations are being created with the support of private enterprises and have a purely economic function. Associations of outgrowers in the horticultural sector (exporting cut flowers) in East African countries, such as Kenya, are an example.
- Community groups formed under village leadership with a strong community development focus. They attract funding and other support from outside. Some are firmly rooted in the village community with strong local leadership and they maintain themselves, even without outside support. Others are the results of outside interventions, for example in community-driven development programmes, and can barely survive once outside support stops.

As part of the process of political democratization and decentralization, but also as a result of economic liberalization, FOs have been created and have emerged at district, provincial and national levels. They are the result of two major, often closely linked processes (Diagne and Pesche, 1995; Bosc et al., 2002):
- A top-down process in which the state plays an important role, with the aim of improving agricultural input supply and product marketing at other levels (i.e. other than the village); often as part of sector-wide reforms. These organizations (often called 'cooperative unions' or 'producers' unions' of the aforementioned farmers' and producers' groups for export-destined cash crops) are generally well-structured, organized around commodities and have an economic focus. They aim to provide management support and reinforce capacities of member village farmers' and producers' groups (e.g. primary societies and village producers' groups).
- A more bottom-up process, through which organizations (federations, syndicates, etc. of farmers, producers, community groups or outgrowers' associations) have been created at the initiative of farmers themselves, with the aim of defending farmers' interests in policy development and implementation. Establishment has often benefited from support by international cooperation agencies. These types of FOs represent a mix of commodity-based and community-based organizations and may be more

loosely organized. Outgrowers' associations in sectors that are both labour and capital intensive, such as the export-oriented horticultural sector, that have mainly large holders as members, may also create syndicate-like organizations.

District, provincial and national organizations often fulfil a wide range of functions, such as:
- defending and lobbying to promote the interests of members (participation in policy-making decisions);
- providing technical and economic services to members (managing knowledge and information support, credit and input supply, processing and marketing of products); and
- contributing to local development for the benefit of their members' community (co-funding of health and education infrastructures and services).

These roles are very much related to the intervention levels, are often complex and change according to the social and economic context. Contrary to those established during the period after independence, the newly created organizations (federations, syndicates, etc.) do not follow prescribed organizational trajectories and present a diversity of legal forms (Bosc et al., 2002 and 2003).

2.4 Links between agricultural research, extension and farmers' organizations

Participatory approaches towards research and extension aim to identify farmers' needs, develop appropriate answers with farmers, valorize farmers' knowledge and inventory critical conditions and factors for disseminating and applying new knowledge (e.g. the farming-system approach, research-development, participatory technology development, etc.). Four basic modes of participation for linking farmers and researchers (or extension agents) can be distinguished (Boyd et al., 1999a; Sutherland, 1999):
- Contractual, whereby work is divided between farmers and research service providers without much interaction in terms of knowledge and information.
- Consultative, with key decisions still being taken by researchers.
- Collaborative, involving real interaction through joint learning that leads to joint decision-making.
- Collegiate (partnership), letting farmers make the final decisions on which research and extension services are needed and how they should be implemented.

At village level, working relations between farmers and researchers/advisers in reality often include elements of both consultative and collaborative working relationships. Collegiate working relations assume that farmers have both the power and means to take decisions.

Individual farmers have always been involved in agricultural research and extension, but organized farmers are now considered an important means of exchanging and transferring knowledge, and thereby reducing transaction

costs and creating synergy. Numerous experiences exist with farmers' groups at the village level: farmer research groups (FRGs: farming systems approach), contact groups (CGs: Training and Visit approach), farmer field schools (FFSs: learning by doing approach), etc. (Heemskerk and Wennink, 2004b; see Table 2.1).

Table 2.1: Examples of links between FOs, agricultural research and extension

		Interfaces	Planning	Implementation	M&E
Local level FOs	Farmers', other interest groups and producer groups	FRGs, FEGs and FFSs	Priority setting for research and extension	Trials, demonstrations and training	Field visits of trials and demonstrations
	Community-based groups	Community groups	Priority setting for extension (and research)	Demonstrations, training (and trials)	
Provincial/district level FOs	Cooperative unions	Committees of commodity research centres Farmers' study groups	Priority setting, planning and resource allocation (levies)	Training by public and private sector Workshops	Open days at research centres
	Federations and syndicates	Committees of eco-regional research centres Farmers' study groups	Priority setting, planning and resource allocation (competitive funds)	Training by public sector and NGOs Workshops	Open days at research centres
National level FOs	Cooperative unions Federations and syndicates	Advisory committee Board of directors	Strategic planning Budgeting		Board and committee meetings

Adapted from Wuyts-Fivamo, 1996.

FOs are generally involved in institutionalized participatory processes for managing agricultural research and extension at both the national and provincial levels (see Table 2.1). Increasing numbers of research and extension organizations have opened up their boards, advisory councils or similar bodies to FO representatives. Multi-stakeholder management committees for research programmes have been created at both the national (commodity or sector programmes) and provincial levels (eco-regional programmes). Commodity-based producers' unions are particularly involved in product-specific research and extension programmes for cash crops such as cotton, coffee, tea or tobacco. At these levels, FOs have the opportunity to direct research and extension services through the constituency that mandates them, and to identify policy and institutional conditions that facilitate innovation (Collion and Rondot, 1998). Participation at these levels concerns:

- problem analysis and priority setting for research and extension activities;

- planning activities, including allocating resources for specific activities, with FOs having true leverage over these activities if resources originate from them (e.g. levies on commodities) or are provided with decision-making powers through intermediate mechanisms arranged by the international cooperation agencies that provide the financing (e.g. competitive funds); and
- monitoring and evaluation (M&E) and accountability, by assessing the outputs and impacts of activities as well as the efficiency with which these have been achieved. Accountability mechanisms are most likely to develop when FOs provide the resources for research and extension.

Increased farmer participation and the emergence of unions, syndicates and federations create opportunities for these organizations to provide knowledge-for-innovation services to their members, especially technology dissemination in response to the persistent lack of field personnel and operating resources of national agricultural extension services. Many experiences of farmer-to-farmer extension have been reported, as well as farmers' research approaches at the field level (Van Veldhuizen et al., 1997). Providing agricultural information through an extension and advisory system that is being managed by a FO requires:
- financial means (mobilization of funds and cost-recovery mechanisms) and human resources (trained technicians);
- appropriate management of finances (accountability procedures);
- personnel (technicians, administrators and accountants with up-to-date attitudes and skills); and
- strong links and interaction with research (strategic and applied).

These requirements frequently strain the organizational viability of often relatively young and inexperienced FOs (Stockbridge et al., 2003). An option for FOs is therefore to link up with public and private sector research and extension organizations by establishing voluntary village FRGs and FEGs, as well as by using the media (radio programmes, television, farming journals, etc.) to enhance the cost-effectiveness of existing services (IFAP, 1995).

2.5 The role of farmers' organizations in agricultural innovation

The AIS concept includes functions that are to be ensured by the system as a whole in order to generate innovations and to facilitate their use. These functions are essential in making sure that the entire system works, i.e. development, diffusion and effective use of knowledge. So-called key 'basic' and 'support' functions can be distinguished (modified from Johnson, 2001):
- *Basic functions* are related to the innovation process itself, and include:
  - identifying problems and needs for innovation; and
  - creating knowledge (research) and supply information (research and extension) for solving problems and responding to needs.
- *Support functions* facilitate the effective use of new knowledge, and include:
  - guiding the direction of the innovation process (e.g. information on consumer preferences, standards and regulations, food safety norms, etc.);

- facilitating the exchange and sharing of knowledge (for learning purposes);
- supplying resources (e.g. funding of research and extension) and incentives (with the perspective of attractive returns on investments made and attenuating risks) for innovation; and
- providing complementary services and a favourable environment (e.g. infrastructure for marketing, buffer mechanisms and insurance schemes to reduce risks, etc.).

FOs can fulfil several roles and thereby contribute to the functions for agricultural innovation (discussed above) and enhance its effectiveness (modified from Hussein, 2001 and Bosc et al., 2003) through:

- Voicing the problems and needs of farmers in directing knowledge-for-innovation services (e.g. research, extension and training). Commodity-based producers' organizations with their own financial resources are in a position to organize and/or outsource some of these services themselves, while community-based organizations may, to some extent, offer such services on a more voluntary basis.
- Organizing the exchange and sharing of knowledge among members, as well as with other stakeholders (e.g. initiating multi-stakeholder platforms). Through their economic roles FOs are often well-informed about markets, which helps them define the overall direction and thrust of innovation.
- Providing economic services (e.g. input supply and product marketing) and organizing financial services (e.g. outsourcing savings and credit schemes, and providing insurance) to their members, which facilitates investments and attenuates risks.
- Coordinating the services provided to their members and ensuring complementarity (of knowledge as well as economic services). This means establishing functional relationships between different FOs (i.e. 'bridging') and with other actors ('linking') that operate within the sector or region (Heemskerk and Wennink, 2004b).
- Contributing to community-oriented social services (e.g. education and health) for their members and infrastructure development (e.g. rural roads, storage and processing facilities) that facilitate stronger members' and non-members' entrepreneurial capacities.
- Representing farmers and participating in policy and decision-making processes for creating conditions and building institutions that foster innovation.

Village FOs, even when initially created with primarily economic aims, have always played a role in agricultural research and extension. Commodity-based producers' groups, which were established under the supervision of state technical services or a parastatal, have been important in disseminating information on production and processing technologies – in principle they provide a clear focus for innovation. At the other end of the spectrum, community-based groups that operate around natural resource management, local development issues etc., often created and supported by the non-profit private sector, and even farmers' groups, which are more heterogeneous than

producers' groups, generally have a much broader array of interests (Boyd et al., 1999a and b). However, both types of village FOs are strongly rooted in rural communities and provide informal but well-established networks for exchanging knowledge and information. As organized entities they have clear advantages in pooling knowledge, aggregating demand and disseminating information (Collion and Rondot, 1998).

Differences in FO origins, memberships and purposes, make prioritization and aggregation of members' knowledge service needs a complex process at provincial and national levels. Commodity-based cooperative unions have a 'natural' focus, while identifying priorities that are often linked to required facilities for credit and input supply. They may also have the necessary funds to direct or provide research and extension themselves. Federations and syndicates represent a much larger array of interests and focusing on priorities may therefore become 'artificial'. They often depend on public sector or donor funding for access to knowledge services (Carney, 1996; Boyd et al., 1999a and b). Funding mechanisms (e.g. multi-stakeholder managed competitive funds, cost-sharing arrangements through levies, etc.) and the related leverage mechanisms ultimately define the power for FOs to really guide services and determine the roles they can play in innovation.

2.6 Challenges for farmers' organizations in agricultural innovation

FOs find themselves in dynamic multi-stakeholder settings that create both opportunities and challenges (see Table 2.2). Opportunities have often been seized by FOs and, in some way, they represent the present 'state of the art', but they also pose new challenges.

Agricultural services are most likely to contribute to rural development if they address the genuine farmer-felt needs and develop innovations that take account of farmers' experiences and circumstances. Farmers have been improving agricultural practices ever since they started farming and therefore they are not mere passive users of new technology. Farmers' knowledge has been widely applied to achieve innovation but little is known of the institutional aspects of building on farmer innovation and making it available for larger networks of researchers and farmers. FOs therefore need to be well-informed of farmer innovation capacity, which means that strong links with grass-roots groups are essential and learning organization reflexes are required (Heemskerk and Wennink, 2004b).

Links between farmers, agricultural research and extension can be very diverse according to the service decentralization level, the core functions of the FOs involved and the funding mechanisms applied (Boyd et al., 1999a). FO participation in research and extension management makes these services more responsive to farmers' needs and appropriate to the overall AR&D context if links are formalized, while 'agenda setting' goes beyond mere priority-setting procedures and takes into account the farmers other main concerns (Collion and Rondot, 1998; Hussein, 2001). Functional links that are based on farmer-

Table 2.2: Ongoing agricultural sector reforms, opportunities and challenges for FOs

Ongoing reforms	Opportunities	Challenges
Institutionalization of participation in agricultural services	Integration of farmers' knowledge and experiences	Strengthen the learning capacity of FOs
	Farmers' priority setting for research and extension services	Gain real leverage power on service providers
Economic liberalization and privatization of services	Wider range of (private) service providers	Access to various knowledge and information sources
	Strong links between commodity-based FOs and the private sector	Enhance equitable representation of women, smallholders and resource-poor farmers
Decentralization of governance and deconcentration services	Decision-making at lower governance and service levels	Link with (local) actors to develop partnerships for innovation
	More client-oriented and demand-driven (public) services	Develop (external and internal) accountability mechanisms
Political democratization	FOs are now key stakeholders (policy formulation and implementation)	Withstand political pressures and keep focused on farmers and FOs' objectives
		Avoid institutional overload of FOs (develop core functions)

Adapted from Carney, 1996.

centred and farmer-accountable partnerships with appropriate funding mechanisms can also contribute significantly to 'revitalising' public-sector services (IFAP, 1995).

The range of knowledge and information sources for FOs is much larger than that of public agricultural research and extension organizations. Farmers also deal with operators in APVCs (input providers, processors, traders, consumers, etc.) as well as interest groups and local development leaders (local governments, lobby organizations for nature conservation, etc.) with whom they have to interact in order to articulate interests and collaborate to achieve innovation (Hussein, 2001). Links with these stakeholders widen the knowledge scope and provide information on market access, safety norms, environmental regulations, etc. that can guide, and even trigger, further innovation.

New FO networks have generally emerged within a context of democratization. They adopt a wide range of purposes to respond to members' needs in an environment where the public sector retreats, but the privatization of goods and service provision continues. Commodity-based unions develop links with the private sector and have internally generated resources to fund public service

provision. However, most federations and networks are less well endowed, which affects their ability to build links with both the private and public sectors (Hussein, 2001). These organizations often regroup member organizations that cover a wide spectrum of farmer households; they then have to deal with diverging interests and should clearly articulate these within a well laid-out strategy for the benefit of their members.

Farmer participation in such links ranges from setting priorities, project planning and funding to providing research and extension services. Separating AR&D funding and implementation opened the way to an array of new funding mechanisms (competitive funding, levies on commodities, local taxes, etc.), each with their own planning and M&E instruments, and thus providing more power and means (Collion and Rondot, 1998). The common denominator is the fact that contractual relationships begin to develop between clients and service providers. This is a strong incentive for both FOs and agricultural service providers to develop joint participatory M&E instruments and to reinforce accountability procedures.

Economic liberalization offers opportunities for FOs to emerge as operators in APVCs and develop linkages with private-sector actors. However, market access for agricultural products requires policy and institutional conditions that are set by national and local governments (e.g. infrastructure development, tax regulations, etc.). Setting the agenda for innovation in general, as well as for knowledge-for-innovation services, therefore needs to be clearly articulated and complemented by FOs lobbying for the implementation of favourable (national and local) policies.

Finally, FOs are now recognized as major stakeholders in agricultural policy formulation and implementation. They are heavily burdened with participating in all kinds of consultative processes, particularly at national and provincial levels. In addition to the traditional project implementation by state services, NGOs, consultancy firms and FOs are currently also being considered by development agencies as potential project managers and implementers. In total this may overload FOs and put an enormous strain on their organizational resources; it risks making them more donor-oriented rather than member-oriented. FOs therefore face the challenge to clearly identify core functions according to their overall institutional context, levels of operation and their members' demands for services (Chirwa et al., 2005).

3 Methodology of the case studies

3.1 Research objectives

The research presented in this bulletin has three objectives. Firstly, it aims to assess the role of FOs in agricultural innovation in selected Sub-Saharan African countries where the agricultural sector has undergone significant reforms over the last decade. Emphasis is being placed on links between FOs and other key actors involved in innovation and on the contributions that FOs make to innovation. Secondly, research has also identified the problems and constraints that hamper FOs in fulfilling their role in innovation; potential solutions were developed, together with partner FOs. Since the research in this study was conducted in partnership with FOs, each of these defined their specific focus for gathering and analyzing information concerning these two objectives. Thirdly, the review of research results helped identify best practices and lessons learned from real-life situations. These provide a basis for developing recommendations to enhance the role of FOs in agricultural innovation that addresses both practitioners and policy makers.

3.2 Approach

The research undertaken in Benin, Rwanda and Tanzania in 2004 used a case study approach. This is a qualitative and empirical method that investigates FOs in their real life situations. Teams composed of FO staff and resource personnel from agricultural research and extension organizations conducted case studies, with support from KIT experts. These teams selected research tools (identification of key actors; inventory and analysis of links; assessment of FO capabilities) and checklists (interviews with key actor representatives), to gather and analyze information. Research results were discussed and verified in local workshops for FO members, government officials, FO staff and research teams.

3.3 Analytical framework

The AIS concept provides a framework for gathering and analysing information by distinguishing the following aspects (adapted from CTA/UNU-Intech/KIT, 2005):

- The *policy, social and economic environment*, which is the overall setting that shapes institutions and facilitates interactions between FOs and other key innovation actors. The case study reviews particularly focus on: the

institutional setup of agricultural research and extension (in a decentralized context); funding mechanisms for these services; emergence of the private sector; and the membership basis of the FOs (integration of farmer households into market economies).
- The *key actors* are the FOs and those public-sector organizations and private enterprises that provide knowledge, information and technologies, and link/interact with FOs. Their interests and methods for providing goods and services that contain knowledge and information are described. Information on FOs concerns their main characteristics, such as type of organization, core functions, organizational structure, systems and procedures, and the diversity of their member constituency.
- The *links that exist between the key actors* at different levels. It is often these interfaces that set the main directions for innovation, prioritize problems and needs for research and extension services, plan activities and account for the results of such services. Links can be analyzed according to: farmer representation; leverage for directing services; planning procedures; participation mode of farmer representatives; and accountability mechanisms. Specific issues include: the role of farmers' knowledge; socioeconomic diversity among farmers; and managing information flows.
- For all key actors, and notably the *FOs' contributions to different functions in agricultural innovation* have been identified. There is an abundant amount of literature available concerning the functions that can be distinguished for innovation. The case studies defined so-called key 'basic' and 'support' functions (modified from Johnson, 2001; see chapter 2.5).
- AIS *performance* is assessed in terms of innovations generated (Tanzania case studies) or the existence and function-level of links (Benin and Rwanda case studies). Strengthening these links and enhancing the capabilities of all actors can improve performance. The problems and constraints that FOs face in linking with other key actors or generating innovations, and the capabilities that need to be strengthened, were therefore identified.

The review of the case study results allowed the research teams to identify best practices and lessons learned. Best practices are outstanding results in a particular situation; they show great potential for other situations, either applied directly or in adapted form. Lesson learned are defined as knowledge gained through experience that is applicable and, when shared, can be beneficial in other situations and circumstances.

3.4 Case studies

Benin

The first Benin case study concerns the national federation of village POs (producers' organizations), plus district and provincial producers' unions in Benin *(Fédération des Unions des Producteurs du Bénin*, FUPRO). The village POs were originally created by a parastatal to handle the input supply and marketing of cotton, but also to promote other production and marketing chains. District, provincial unions and FUPRO give management support to

these village POs and represent them in fora with both public-sector and private-sector entities. FUPRO initiated the study to analyze links between its member organizations and agricultural research and extension services, and to formulate ways to enhance participation by their members in these services. The study focuses on cotton research that is largely financed by levies on the cotton sold.

A second comparable case study was conducted at district level with support from FUPRO. This concerns three district producers' unions in northern Benin: two are FUPRO members, and organized around cotton production and marketing (Kalalé and Boukoumbé district unions, UCPs) plus one district union of cashew growers (ACooBéPA of Ouèssè/Tchaourou districts). The district cashew growers' union was created with support from an NGO-managed project to organize input supply (mainly seeds and seedlings), development and dissemination of improved production technologies, and marketing of cashew crops. This second Benin case study focused on their links with research and extension services, plus other knowledge and information sources for innovation, and the capabilities needed to reinforce these links.

Rwanda

The Rwanda case study involves FOs (affiliated to IMBARAGA) and their implication in improving potato production and marketing in Rwanda (Ruhengeri and Gisenyi provinces). The Rwanda national network of FOs *(Réseau des Organisations Paysannes au Rwanda*, ROPARWA) and the national agricultural research organization *(Institut des Sciences Agronomiques du Rwanda*, ISAR) requested this study to analyze problems relating to potato production and marketing, and to propose future activities for enhancing innovation. A team of students from the International Centre for development-oriented Research in Agriculture (ICRA), in Montpellier conducted the study, as part of their training curriculum. During fieldwork in Rwanda the team elaborated a typology of potato producers, identified the key stakeholders in potato production and marketing, analyzed their links, organized workshops and recommended targeted AR&D activities.

Tanzania

The two Tanzanian case studies concern the functioning of a national network of farmer groups, MVIWATA (in the Morogoro and Mvomero districts of the Morogoro region and the Kongwa district of the Dodoma region), and one of its member organizations, MVIWAMO (in the Monduli district of the Arusha region). Both organizations are examples of 'farmer networks'. They both aim to promote initiatives for self-reliance and collective action by reinforcing local capacities for networking and representation. The two case studies present the way in which the networks perceive their role and operate in promoting agricultural innovation. Specific objectives included: identifying best practices used by network members to develop and disseminate agricultural innovation

technologies and feed them into a large network, the major achievements realized by farmers, and the barriers that they encountered.

The Tanzania Department of Research and Training (DRT) prepared a paper on its view of the role played by FOs in agricultural research and extension, which is also included in this bulletin. The paper is partially based on a recent study into farmer empowerment and provides a basis for establishing so-called district 'farmer fora' for an agricultural sector support programme. The paper presents the agricultural research viewpoint on FOs and farmer networks in Tanzania, such as MVIWATA and MVIWAMO.

4 Orienting research and development for cotton production. The national federation of producers' unions (FUPRO) in Benin

Tiburce Kouton[4], Gaston Yorou[5], Guy Nouatin[6] and Bertus Wennink[7]

4.1 Introduction

More than 75% of the Benin population work in the agricultural sector, which contributes around 40% to the Gross Domestic Product. Cotton alone contributes approximately 10% to the GDP (FAO, 2004). Since the 1980s cotton production has significantly increased, mainly through area expansion. At that time, parastatals managed all operations (input supply, processing and marketing of cotton) and support services, which were financed through cotton levies (rural infrastructure, research and extension). Parastatals also organized farmers into village producer organizations (POs), which manage input supply and marketing. However, since the beginning of the 1990s the sector has undergone a number of reforms in order to tackle problems of mismanagement and inefficiency. As a result, cotton-based POs are now involved in decision-making processes, including the orientation of cotton research and extension. POs and agricultural research and extension are also represented at different administrative levels and this offers opportunities for assessing and strengthening cooperation between these institutions.

4.2 Governance of the cotton sector

Cotton sector reforms started with liberalization of the sector and the privatization of input supply and cotton ginning. In 1994, the village POs *(Groupements Villageois*, GVs) organized themselves into a national federation named FUPRO. They also created a seperate national cooperative structure to manage tender procedures for input supply. However, an integrated approach by the sector was being maintained as a policy principle for further liberalization. Both the private sector and FUPRO member POs are responsible for organizing logistics within the sector (input supply and marketing of cotton) and setting cotton prices. The cotton producers and ginners also decide on the funding of support services through cotton levies: seed multiplication and distribution; quality control; cotton research and extension; and maintenance of rural roads. In 1999 the interprofessional association for cotton *(Association*

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Interprofessionnelle du Coton, AIC) was created to serve as a platform for consultation among, and representation of, actors in the cotton sector (Cotton Policy Brief, 2002).

4.3 Key actors in the innovation of cotton production

Agricultural research and extension

The national institute for agricultural research *(Institut National des Recherches Agricole du Bénin*, INRAB) is an autonomous public institute and is the coordinating agency for the NARS. Research is organized in eco-regional programmes (3), plus sector and thematic programmes (8) that are managed by research centres *(Centres de Recherche Agricole*, CRAs). Research-Development (R-D) teams are attached to the eco-regional CRAs and conduct on-farm research. Cotton research is managed by a commodity research centre *(Centre de Recherche Agricole – Coton et Fibres*, CRA-CF) in Parakou, with its headquarters based in Cotonou, which has a national mandate. It has three sub-programmes (entomology, breeding and agronomy), implemented by two branch offices *(Antennes)* in the northern (Parakou) and southern (Bohicon) cotton-production regions, which are conducted in and around research stations *(Centres Permanents d'Expérimentation*, CPEs; a total of 14).

Public agricultural extension services in Benin are deconcentrated, and are represented in all provinces and districts. The extension services were responsible for organizing and overseeing village POs (GVs). In the 1990s they concentrated solely on agricultural extension. In 2004 they became *Centres Régionaux* and *Communaux pour la Promotion Agricole* (provincial CeRPAs and district CeCPAs), which included the opening of agricultural advisory services to private organizations and further decentralization. Extension services now focus on advising farmers, rural communities and the district authorities *(Communes)* on information relevant to production and marketing chains.

Cotton producers' organizations

Village cotton POs (GVs) were a considerable success since they received payments for their efforts of collecting and weighing cotton for the ginneries. The fixed prices of cotton before the planting season also allowed for discounts *(ristournes)* to GVs in case market prices turned out to be higher after harvesting than initially estimated. In 1994, GVs organized themselves into apex organizations: FUPRO, *Unions Départementales des Producteurs* (provincial UDPs) and *Unions Communales des Producteurs* (district UCPs), which all depend on cotton levies for their functioning.

Private sector

Private input suppliers and cotton ginners are also actors in the innovation process. Inputs are considered essential for cotton productivity and quality. Input suppliers deal with international fertilizer and pesticide manufacturers,

They are well informed about the latest developments. Furthermore, access to the Benin market (notably for cotton pesticides) is subject to regulation. The procedure for gaining authorized access and participating in tendering procedures foresees the testing of new inputs by CRA-CF. Ginners are particularly keen on those cotton-fibre characteristics that are important for processing (spinning, weaving, dying) and are interested in CRA-CF's cotton breeding activities. They are well informed about the norms and standards used in the global market that determine the quality, and therefore the prices, of cotton fibre.

4.4 The national federation of producers' unions (FUPRO)

FUPRO's stated mission is capacity reinforcement of POs to enhance their role as interfaces within the agricultural sector for policy formulation and implementation. FUPRO focuses on lobbying and advocacy, while unions give management support to GVs. The unions are directed by elected bodies and have a technical staff (managing director, accountant and trainers). Numerous other (apex) POs have emerged in Benin and even FUPRO has seen 'dissident' movements emerge. Still FUPRO members represent more than 80% of the national cotton production.[8]

With respect to innovation development, FUPRO aims to:
i facilitate the exchange of information between member unions and international (cotton) POs;
ii stimulate farmer-led action-research;
iii serve as an information centre for members;
iv train members; and
v represent their members in AR&D organizations.

The following activities contribute to achieving these aims.
- Representing member organizations in regional and international federations.[9]
- Publishing a magazine *Voix des producteurs* that includes information on ongoing policy debates and internal organization issues, and reports on training sessions and meetings that have been held. It also provides information through factsheets *(fiches techniques)*.
- Organizing (together with UDPs and UCPs) training sessions for elected officials, staff members and producers, mainly on organizational strengthening and management procedures relating to logistics for input supply and cotton marketing. Technical issues often concern newly introduced inputs for cotton production.

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[8] Due to governance and financial crises within numerous GVs, FUPRO and AIC proposed transforming GVs into small, exclusively cotton POs. Consequently, in 2005, some UCPs started reorganizing themselves around cotton production and marketing to become *Unions Communales des Producteurs du Coton*.

[9] Such as: the *Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest* (ROPPA) and the International Federation of Agricultural Producers (IFAP).

- Representing cotton producers in the AIC, the multi-stakeholder forum for the cotton sector. UDPs in turn represent producers in meetings with AR&D institutions at the provincial level.

4.5 Links between key actors

Platforms, committees and meetings

FUPRO, UDPs, extension services and cotton ginners meet twice a year to discuss the planning for multiplying and distributing cottonseeds that are delivered to farmers free of charge. At these meetings cotton researchers (CRA-CF) present the results of cotton breeding experiments and propose new varieties for multiplication. Other research results may also be discussed.

The AIC meets once a year to decide on the funding of the annual cotton research programme submitted by CRA-CF. The AIC also decides on funding (through cotton levies) of other support activities, such as cottonseed production and distribution, and agricultural extension.

Agricultural research centres (CRAs) with an eco-regional mandate (excluding commodity programmes such as cotton) also organize annual multi-stakeholder meetings in which UDP representatives participate. Research results are presented by NARS researchers and discussed by other stakeholders (agricultural extension and FOs), who also identify new research priorities. A multi-stakeholder committee (including UDP representatives) then selects research proposals (adaptive research and pre-extension trials) for implementation and allocates the necessary funds.

Each provincial extension service (CeRPAs) elaborates an annual activities programme and budget, which are discussed and amended during an advisory committee meeting. Until recently UDPs were represented on this committee, but under the new statute of CeRPAs, a board of directors (without PO representation) has now replaced this committee.

Budget constraints (CeRPAs and CeCPAs mainly depend on government funding) seriously hamper the effectiveness of front-line extension services. For some years now the AIC has financed the contracting of newly recruited extension agents that are stationed in the main cotton production regions and managed by CeRPAs.

Ad hoc contacts

There are regular contacts between the producers' unions (UDPs and UCPs) and the extension services (CeCPAs and CeRPAs), mostly on governance and management problems of GVs and UCPs. Since they were the main initiators of GVs, many producers consider the extension services to be the sole structures competent to address their problems. Through these contacts, they may also decide on joint activities. This is particularly the case when an UCP has a

liaison officer for AR&D *(Chargé de Vulgarisation Agricole)* who is appointed by the elected officials, or a staff member who shows a particular interest in AR&D issues.

4.6 Taking account of farmers' knowledge and experience

The cotton research centre (CRA-CF) organizes farmer field schools (FFS; *Ecoles Paysannes)* for base-line agronomic analysis of cotton production and to organize field trials and tests.[10] This base-line analysis allows researchers to identify the main thrusts for new research. Trials concern participatory breeding of cotton varieties that have shown interesting on-station performance and tests to demonstrate improved pesticides and fertilizers. Special field agents *(enquêteurs PARCOB)* are employed to facilitate village meetings of cotton producers around these trials and tests.

Agricultural research in Benin has a long tradition of farmer participation, mainly through on-farm research by the multi-disciplinary R-D teams at the eco-regional CRAs. These teams have developed an approach to participatory research that takes account of farmers' knowledge when setting research priorities, designing trials and in assessing the results of these trials. Village POs and district union (UCP) representatives participate in these village-level assessment meetings, which also provide input for the aforementioned eco-regional CRA multi-stakeholder meetings (see chapter 4.5).

The agricultural extension services (CeCPA agents) use participatory methods to plan extension activities together with village community representatives. Every year extension agents identify key issues during village meetings and propose an activity plan for extension. These village plans are synthesized by CeCPAs to identify the main extension issues for the whole district.

4.7 Setting the agenda for cotton research and extension

Cotton production problems encountered by farmers, and their consequent need for knowledge to help resolve these problems, are communicated to cotton research and agricultural extension services in several ways, through:

- Farmers institutions. The village PO (GV) is informed by its members and in turn informs the district union (UCP), which may either inform the district extension service (CeCPA) or the provincial union (UDP). The UDP can also inform the provincial extension service (CeRPA) or FUPRO.
- Agricultural extension services. During field visits the extension agent observes specific problems and informs the district service (CeCPA), which in turn may inform its provincial service (CeRPA). In both cases, extension services decide to adapt their ongoing extension programme or inform the nearest cotton research (CRA-CF) branch. The CeRPAs actively cooperate with both the nearest CRA-CF branch and eco-regional CRA and play an

[10] The *Projet d'Appui à la Recherche Cotonnière du Bénin* (PARCOB), funded by the French Agency for Development (AFD).

active role in the multi-stakeholder fora organized by CRAs.[11] The role of UDP representatives in these fora is generally perceived as passive.
- Research institutions. The cotton researcher also observes problems in the field and raises these during meetings at the CRA-CF branch. Cotonou headquarters may decide (after reviewing research results and defining new thrusts) to integrate these problems into the new research programme. The researchers then elaborate proposals for the research programme to be presented at an AIC meeting. Funding of the new research programme is discussed by AIC, of which FUPRO is a member. The AIC meetings on the funding of both cotton research (CRA-CF) and agricultural extension (CeRPAs) focus entirely on financial issues. For example, amendments to the submitted programmes are mainly based on available funding, which largely depends on cotton prices paid on the world market, and is not related to the urgency of the proposed activities.

Extension agents (CeCPA/CeRPA) and cotton researchers (CRA-CF) thus form the main vectors for identifying the problems and need for innovation. They are methodologically competent and operate within institutional settings that allow for continuous analysis of cotton production systems. Besides field information collected from producers, researchers also obtain information from other sources, e.g. the international scientific community to which they belong[12], proposals by private firms to test new inputs, and data on cotton production. For cotton breeding, researchers rely on information concerning world markets and expected trends, since breeding is a long-term process. CRA-CF therefore has a large stock of reliable cotton varieties.

All key actors involved in cotton-sector innovation consider CRA-CF as the one entity that determines the innovation agenda. On the one hand, all players accept this situation since CRA-CF performs well and provides tangible results. However, on the other hand, stakeholders feel that all knowledge is centralized at CRA-CF, without adequate institutional and decentralized mechanisms for consultation and information.

4.8 Dissemination of information and technologies

Cotton researchers consider producers who collaborate with them (through on-farm trials, pre-extension tests and FFS) as important partners for technology dissemination. CRA-CF still prefers the public extension system for scaling up technological innovation, despite the budget and personnel constraints encountered by the extension services that hamper their performance. AIC's funding of contracts for newly recruited extension agents provides an opportunity for progress, since these agents have to focus their activities on

[11] With governmental budget constraints, CeCPAs and CeRPAs now depend entirely on financing of pre-extension activities from (donor) funds of the CRA-coordinated regional research programmes.

[12] Through their longstanding working relationship with the *Centre de coopération Internationale en Recherche Agronomique pour le Développement* (CIRAD).

cotton production and producers. Extension agents organize village meetings and demonstrations, including pre-extension, to inform farmers of improved agricultural technologies. The village Contact Group (CG)[13] meets to discuss the demonstrated techniques and its members are then supposed to inform other farmers.

Private firms support the dissemination of crop-protection products and techniques by funding training sessions, in collaboration with producers' unions (UCPs). Dissemination of new cotton varieties is decided during meetings on cottonseed multiplication; adoption of new varieties by farmers is thus a *de facto* process, since seeds are distributed free of charge. These meetings are one of the few fora where producers, researchers, extension agents and cotton ginners discuss the relevance and usefulness of new varieties.

4.9 Main constraints and challenges for FUPRO

Links between producers' unions (UCPs and UDPs) and cotton research (CRA-CF branches) are weak. POs are not informed of research activities and management. In turn, CRA-CF has a lot of knowledge that it should share with producers. Although the AIC could be used, this body is considered by all stakeholders to be too involved in funding issues. All actors accept the principle of consensual multi-stakeholder management of the cotton sector. However, the subsidiarity principle (already applied by eco-regional CRAs) should allow for the creation of provincial fora, where the interests of key actors are presented and discussed, orientation for cotton research is set, and a first draft of the annual CRA-CF research programme is reviewed. The AIC forum can then decide on the funding issues.

Producers' unions have regular contact and collaboration with extension services (CeCPAs and CeRPAs), but the official fora between extension services and POs are presently not functioning. These fora *(Comités Communaux et Départementaux de Vulgarisation)* meet under the responsibility of the extension service. They can play an important role in mainstreaming the goals that are pursued by extension (and financed through cotton funds) with the aims that have been defined in the district development programmes of the newly established *Communes*. Also, with the changing statute of the CeRPAs, POs are surprisingly no longer represented on the new boards. This is a subject for lobbying by FUPRO, together with, for example, micro-finance institutions to be represented on boards, in order to bring them in line with a government policy that assigns a more coordinating and regulating role to public-sector organizations (e.g. the CeRPAs).

Communication of the cotton producers' need for knowledge largely depends on the extension services. However, this information system is considered inefficient. Firstly, communicating producers' needs between village POs and UCPs is not well organized. Although information flows concerning logistics for

[13] A reminiscent of a previous World Bank funded Training and Visit extension programme.

input supply and cotton marketing are working, information concerning innovation is not flowing well. Secondly, the producers' representatives rarely account for decisions taken in AR&D fora where POs participate. Thirdly, the national extension service used to be effective in communicating producers' needs to research, but it is currently severely handicapped by a lack of field personnel.

The role of UCPs and UDPs within the innovation system is perceived as weak, despite the interface institutions that have been created over the last few years. Trials and demonstrations are still being conducted by research and extension services on a rather limited scale without an institutional contribution by the unions to enhance the scaling up of these services. Also those who participate in various fora on behalf of the UDPs are not always considered to be representative. In the arena of stakeholders who are trying to influence the agenda for innovation, POs might thus lose out. It is therefore a major challenge for FUPRO and its member organizations to equip themselves as effective partners in innovation by:

- integrating 'innovation' into their mission statements;
- adapting mandates and job descriptions for elected officials and staff members to deal with knowledge and information management;
- training officials and staff in AR&D approaches; and
- developing tools for communicating with (public and private) research and extension institutions.

5 Cooperating with agricultural service providers for research and development. Three district producers' unions in Northern and Central Benin

Osée D. Dotia[14], Tiburce Kouton[15] and Bertus Wennink[16]

5.1 Introduction

Farmer participation in agricultural research and extension is an appropriate strategy for enhancing innovation, which essentially means sharing and applying knowledge and requires close interaction between these actors. Over the last decade, the research and extension sector in Benin has developed participatory methods for involving farmers and their communities in planning and monitoring the services provided. Fora have been created to institutionalize this participation, but these will only be effective if POs fully exploit these opportunities (RAAP, 1999; Arodokoun et al., 2002). This is even more valid since POs are organizing themselves into multi-level networks. Other POs have also emerged in the wake of economic liberalization and this creates opportunities for AR&D partnerships. The question is: how have these developments affected local POs and their relations with agricultural research and extension?

5.2 Institutional setting

This case study concerns three local POs in northern Benin. Two of them, in Kalalé and Boukoumbé districts in the northeast and northwest of Benin respectively, are FUPRO union members. The third local organization, in Ouèssè and Tchaourou districts in central Benin, is a union of village cashew growers' groups. All three organizations cover a district (or *Commune*). The new mandates for district authorities became operational at the end of 2002, with the election of governing bodies being the last step in implementing the decentralization policy. District governments are now involved in a process of multi-stakeholder consultation for defining local development plans. Districts have always been the main level of deconcentration for public-sector services, of which the agricultural extension service is the most important. The most recent reforms of the extension system (in 2004) emphasize the development of production and marketing chains, and aim to implement this approach through support to district authorities. The national agricultural research institute also implemented major reforms in 2000, by creating research centres with an eco-regional, provincial mandate (Arodokoun et al., 2003).

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5.3 Agricultural services for research and development

Agricultural research and extension

Two provincial research centres *(Centres de Recherche Agricole*, CRAs)[17] have eco-regional mandates for the three districts concerned: CRA-Centre in Savè covers the Ouèssè district and the CRA-North in Ina covers the Kalalé, Tchaourou and Boukoumbé districts. These centres organize annual multi-stakeholder meetings to discuss research results and to set priorities. Both CRAs have multi-disciplinary R-D teams that conduct on-farm research in each of the three districts investigated. CRA-Centre also houses the national forestry research programme, which conducts research on cashew trees.

The national agricultural extension service is represented at the district level by the *Centre Communal pour la Promotion Agricole* (CeCPA), which depends on the provincial Centre (CeRPA). The district extension service has a technical team that provides support to extension agents working with village communities. However, due to structural adjustment measures in the 1990s the extension service saw its field personnel drastically reduced. Over the past few years new field agents have been recruited through AIC funding (cotton levies; see previous case study). In Kalalé all technical staff and field extension agents (seven personnel) are paid from AIC funds, while in Boukoumbé two field agents (out of the seven foreseen but not yet present) have AIC contracts.

Agricultural diversification projects

Three externally funded agricultural diversification projects support district-based activities, e.g. a project to develop production and marketing of roots and tubers (yams, cassava, sweet potatoes and Irish potatoes) provides technical assistance, facilitates access to markets and organizes producers and processors[18]. Another project promotes cassava production and marketing, and also provides seedlings to farmers[19]. A third project focuses on diversifying agricultural production in cotton-producing areas.[20] This last project also targets cashew, by supporting the training of nursery gardeners and planters and providing registered seeds. Registered seed production and improvement of plantation techniques have been outsourced to the forestry programme under the CRA-Centre in Savè. All three projects contracted NGOs to manage project activities. The NGOs in turn employ field agents to support producers and village groups.

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17 Deconcentrated research entity of the *Institut National des Recherches Agricoles du Bénin* (INRAB).

18 *Programme de Développement des plantes à Racines et Tubercules* (PDRT) funded by the Government of Benin (GoB), the West African Development Bank (BOAD) and the International Fund for Agricultural Development (IFAD).

19 *Programme de Développement de la Filière Manioc* (PDFM) funded by the GoB and IFAD.

20 *Projet d'Amélioration et de Diversification des Systèmes d'Exploitation* (PADSE) funded by the French Development Agency (AFD).

5.4 Producers' unions

District producers' unions

The district producers' unions *(Unions Communales des Producteurs*, UCPs) in Kalalé and Boukoumbé are apex organizations of *Groupements Villageois* (GVs) that were created by the agricultural extension service. Organizing GVs was particularly successful in cotton-producing areas. GVs in the Boukoumbé area of the Atacora region were initially organized around groundnut production and marketing which, up to the end of the 1980s, benefited from state subsidies. After these subsidies finished, many groundnut producers switched to growing cotton, despite relatively unfavourable rainfall and soil conditions. During the 1990s, the national extension service transferred responsibilities for managing input supply and product marketing to GVs. In 1994, GVs united in district and provincial unions (UDPs) and the *Fédération des Unions des Producteurs du Bénin* (FUPRO), which provide management support to GVs. FUPRO is a member of the interprofessional association for cotton (AIC), which is a central platform for private-sector consultation and representation (see previous case study). All unions have the same organizational structure: a board of elected directors and a paid technical staff. The unions are almost entirely funded through cotton levies; funds available therefore depend on the amount of cotton produced by the union's members.[21]

District cashew growers' union

The *Association des Coopératives Béninoises de Planteurs d'Anacardier* (ACooBéPA) is a district union of (10) local cashew growers' unions that was created in 2001 with the support of a faith-based NGO, the *Organisation pour le Développement Durable, le Renforcement et l'Auto-promotion des Structures communautaires* (DEDRAS). This organization already managed a donor-funded project for developing cashew production and marketing.[22] DEDRAS is the service provider contracted by the above-mentioned agricultural diversification project to promote production and marketing of cashew in Kalalé and Ouèssè. Cashew growers are organized in village *Groupements de Planteurs d'Ancardier* (19 in Ouèssè and 17 in Tchaourou), which are members of local unions (4 in Ouèssè and 6 in Tchaourou). The district union has an elected board of directors but does not have any technical staff. Membership fees, shares and levies on the cashew nuts marketed are the main sources of funding for cashew growers' organizations.[23]

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[21] For each ton of cotton marketed (over the last few years): 1,725 francs CFA plus discounts went to the GV; 2,875 francs to UCP; 100 francs to UDP; and 100 francs to FUPRO (1 USD = 545 francs CFA). Kalalé produces around 60 000 tonnes of cotton annually, while Boukoumbé does not exceed 20 000 tonnes per year.

[22] *Projet Anfani* (1998-2000) funded by the Netherlands.

[23] Funding mechanisms are presently being reviewed to evolve towards small (village) cooperatives that will be organized according to 'trust' and 'affinity'. Part of the discounts on cashew nuts will finance a common fund that provides credit to individual growers for maintenance of cashew tree plantations.

5.5 Links between producers' unions and agricultural service providers

The cotton producers' unions (UCPs) in Kalalé and Boukoumbé cooperate closely with the district agricultural extension service (CeCPA). However, planning and monitoring procedures are strongly influenced by operations relating to input supply and cotton marketing. Both parties consider their relationship to be good, and they meet on a regular basis. As one elected UCP official in Boukoumbé declared: 'The extension services are our parents; we, producers' organizations, are their children'. The CeCPAs all have a PO specialist to provide management support to village POs (GVs). Sometimes they even continue to supervise GVs, despite the official policy change that also mandated the UCPs to provide a support function for GVs. The support project for cashew production and marketing has a representative on the UCP Kalalé board of directors. He is a cashew grower himself and is actively involved in a training-of-trainers programme for nursery gardeners and planters. The cashew growers' union (ACooBéPA) works closely with DEDRAS, which facilitates management support activities. According to DEDRAS, it adopts a flexible approach in supporting the union; members' experiences form the basis for learning and adapting governance and management procedures.

Both the CeCPAs and the externally funded projects are active at village level through deployment of their own field agents. Each has its own representative and 'favourite' village PO with which it works: GVs for the CeCPA; newly created production and processing village groups (roots and tubers) and cashew growers' groups and unions for the various projects. Working relationships are particularly strong between GVs, CeCPA's extension agents and CRA's R-D teams. Both researchers and extension agents are well aware of the importance of a well-organized input supply as a determining factor for technology adoption and consider GVs an effective network for technology dissemination. All cotton producers, whether they are large or small, are *de facto* GV members when they use the input services provided. Generally speaking, a GV is well informed of AR&D activities going on in the village. Although GV officials are represented on the UCP boards, union officials and staff are rarely informed about aspects other than input supply and cotton marketing issues. For them, the district extension service remains a major source of information, and the institutional memory for technology issues.

5.6 Planning agricultural services

Research

Village meetings between GVs, R-D researchers and field extension agents provide emerging issues for new research activities. Representatives of these three stakeholder groups also participate in the annual multi-stakeholder meetings that are organized by the two provincial research centres (CRAs) for the planning of new research activities (see chapter 5.3). Each stakeholder uses its individual organization and procedures to communicate research issues that

are considered important. Researchers and extension agents are best equipped and organized to communicate these needs:

- R-D researchers invite producers that host on-farm trials to represent farmers in these multi-stakeholder meetings.
- The district extension service (CeCPA) also analyzes the issues that have emerged during village meetings and decides which should be submitted for research and which could be addressed by extension services. Research issues are then communicated to the provincial extension service's AR&D liaison officer, who participates in these multi-stakeholder meetings on behalf of the extension service.

Staff members at provincial producers' unions (UDPs) are also invited to represent farmers in the aforementioned multi-stakeholder meetings. They are also members of the committee that examines research proposals to ensure that they address priority issues. However, the UDPs' elected officials and staff members are rarely prepared to participate in multi-stakeholder meetings. The union knows about the participation of some of their GV/UCP members, who are invited by R-D researchers, but these members rarely account for their participation.

The Atacora UDP recently initiated thematic committees for addressing issues concerning crops and products other than cotton, which reflects the concerns about the feasibility of cotton production in areas such as Boukoumbé. Researchers trained them to identify research issues on diversifying crops to be discussed in the multi-stakeholder meetings.

Extension

The district unions (UCPs) and district extension services (CeCPAs) cooperate in the annual planning of extension activities for the CeCPA. Extension issues are identified and operations planned at the annual district assessment meetings. In practice, discussions are often dominated by cotton production and marketing issues; newly introduced cotton pesticides, which are often considered to be the main innovation, take a prominent place. The UCP also presents its own activity programme, which concentrates on support for the financial and administrative management of GVs. Technology and other innovation issues in its activity programme are essentially related to cotton pesticides.

Research and extension for cotton and agricultural diversification

Diagnostic surveys in villages were conducted when formulating the activity programmes of the three agricultural diversification projects. The surveys generated research issues regarding the targeted crops, and these were integrated into research contracts with agricultural research (INRAB). This approach is also being used for the principal cash crop: cotton research uses information gathered by its own researchers during diagnostic surveys and field trials, and issues communicated by agricultural extension agents to identify research priorities (see previous case study). In both situations, final

decision-making on research activities and resource allocation take place at the national level.

5.7 Delivering and monitoring agricultural services

Agricultural extension by the CeCPAs comprises organizing village training sessions, information meetings and discussions around demonstration plots. Training-of-trainers is a popular approach used by all service providers, but a significant 'information loss' is perceived. DEDRAS trains members of village cashew growers' groups and has a representative and trainer among the elected officials of the district producers' union (UCP). Training sessions on cotton production are mainly organized as a result of CeCPA initiatives. Over the last few years, private input supply firms have also started funding and organizing training sessions on cotton crop protection techniques. This is particularly the case in Kalalé, where a substantial share of the input market is handled by the private sector.

In Kalalé, the new UCP's premises are used for training sessions organized by CeCPA, while in Boukoumbé the CeCPA's offices are used for this purpose. In fact, the Boukoumbé UCP has never had an office of its own and still uses CeCPA's facilities.[24] Boukoumbé produces less cotton than Kalalé and therefore the UCP Boukoumbé has less funds for providing services to its members. In both districts CeCPA and UCP trainers work closely together. The Boukoumbé CeCPA still has a PO specialist who supports and supervises village POs (GVs) at the request of the UCP. However, the PO specialist at the Kalalé CeCPA gives only occasional support to GVs and the union pays for the necessary travel costs. The UCPs are asked by the national AIC to annually assess the performance of the field extension agents recruited with funds from cotton levies, which is considered an 'administrative' procedure by unions.

The CeCPAs and UCPs organize joint monitoring missions: the mission timing and focus issues are determined by the highlights of the cotton campaign. New issues may emerge through the networks used by both organizations and can become the subject of joint field missions. The Kalalé UCP finances these joint missions, while in Boukoumbé the UCP and CeCPA pool their limited resources.

The NGOs involved with the agricultural diversification projects organize their own monitoring missions and UCPs and CeCPAs are not systematically included. A notable exception is the cashew project: the UCP representative concerned is fully up-to-date and informs the union's board of directors.

5.8 Sources of knowledge and information for producers

The public agricultural extension network remains the main information source for the UCP members in Kalalé and Boukoumbé. Private enterprises (for

[24] UCP Boukoumbé only became 'independent' of CeCPA in 1996, although UCP members don't see this as a problem.

cotton-protection techniques) also form another information source in Kalalé. Promotional materials (t-shirts, calendars, etc.) distributed during training sessions seem to provide extra motivation to participate. UCP officials and staff interviewed generally do not know about indigenous knowledge-based innovations, and these are not considered a suitable subject for organizing information exchanges and discussion. However, they claim that producers are particularly strong innovators in times of crises.

The few indigenous agricultural innovations mentioned during interviews are considered to be not important enough for further dissemination. An exception is cattle breeding and animal health. The Fulani cattle breeders in the Kalalé area have a solid reputation for innovations in breeding and animal health. They have hardly any links with 'formal' research and extension services. Cotton producers in Kalalé are traditionally crop farmers and only gradually converted to cattle breeding, as they invested their cotton revenues in animal traction and herds. Union members admit having very little knowledge of 'formal' research activities and achievements. It is only through the UCP representative for the cashew project that they are informed of the range of issues that research can address.

Members of the cashew growers' union (ACooBéPA) that have been interviewed picture a different situation: they cite numerous indigenous innovations followed by rapid dissemination through the network of village cashew growers' groups. In fact, they say it is only a few years ago that cashew (once again) became an official research topic. Information and experiences are shared during the union meetings, and cashew growers are well informed of research activities and results. The regional research centre in Savè provides certified cashew seedlings and trains growers in new planting techniques; this had a strong impact on cashew production and stimulated the cashew growers' interest for formal research.

5.9 Main constraints and challenges for the producers' unions

Union members who participated in three district workshops were asked to assess the capacity of their organizations, with respect to managing knowledge and information for agricultural innovation. Items to be assessed included:

i the mission statement of their union (integration of innovation-related aims);
ii the organizational structure (task descriptions of elected officials and paid staff);
iii human resources (attitudes and skills available for dealing with AR&D and innovation);
iv communication mechanisms; and
v methods and tools for sharing and analysing knowledge (see Table 5.1).[25]

Mission statements do not integrate clear aims concerning innovation, research and extension. Unions explain this by emphasizing that their organizations were

[25] Assessment based on an adaptation of a method elaborated by Gubbels and Koss (2000).

Table 5.1: Capacity assessment for knowledge and information management

Item	UCP Kalalé	UCP Boukoumbé	ACooBéPA Ouèssè and Tchaourou
Mission statement	+	++	+
Organizational structure	+++	++	+
Human resources	++	++	++
Communication and information sharing	+++	+++	+++
Methods and tools	+	++	+

+ = weak; ++ = moderate; +++ = good.

initially established only for input supply and product marketing, with the idea of evolving towards cooperative structures. Knowledge and information for improving practices was previously fairly well organized through the established public agricultural extension service. Now that this system is suffering from a lack of resources, the current roles (particularly of the public and private services, and POs) should be reviewed. Producers feel the need to develop stronger relationships with other actors. The private enterprises that supply input and train producers are cited as an example. The Boukoumbé UCP considers innovation to be a necessity, as they live in a fragile natural environment at a time when state support is being withdrawn. However, management problems (in the cotton sector) that have a direct impact on their revenues are considered even more urgent.

The Kalalé and Boukoumbé UCPs consider their organizational setup to be suitable for handling research and extension issues. A voluntary AR&D liaison officer is in charge, and he/she manages relations between producers, researchers and extension agents; and the paid UCP staff is qualified. However, in practice much depends on their individual interests and skills, as no formal training is provided and criteria for fulfilling these positions need to be specified. Capacities also need to be reinforced to go beyond merely 'identifying problems and constraints' to fully participating in managing partnerships with research and extension. The cashew growers' union has appointed a liaison officer for the NGO-financed training-of-trainers programme, but has also not specified the necessary criteria and responsibilities.

The three district unions consider that communications operate well, since information flows between the different network levels, allowing for timely input supply and product marketing. The fact that elected officials have received literacy training is mentioned as a determining factor for successful communication, especially when communicating with other outside organizations. According to union members, information concerning innovation, research and extension could be organized through the same mechanisms, but they would need tools for analysing emerging issues for research and extension. The Boukoumbé union considers a partnership with the district extension service to be essential for sharing and disseminating knowledge and information, since both partners have limited human and financial resources.

6 Linking actors for potato production and marketing. ROPARWA and IMBARAGA initiatives in north-western Rwanda[26]

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6.1 Introduction

Irish potato crops were first introduced in Rwanda at the beginning of the 19th century and are now being cultivated throughout Rwanda, particularly in the northern provinces of Ruhengeri and Gysenyi where rainfall and soil conditions are favourable. Since the mid-1970s, when transport and infrastructure developed, marketing potatoes for urban consumption has taken on a new importance. In 1979 the Government of Rwanda (GoR) initiated a national programme to improve potato production *(Programme National d'Amélioration de la Pomme de terre*, PNAP) that concentrated on the development and dissemination of improved varieties. Unfortunately, the civil war in 1994 damaged the country's infrastructure and potato production was seriously affected. But since 1999, both FOs and NGOs have initiated activities to rebuild both the physical and knowledge infrastructure. However, the potato production and marketing chain is still facing serious problems, such as insufficient production and poor quality of seed material, the lack of storage facilities, and other management inefficiencies.

6.2 Policy context

Since independence and up to the 1980s, Rwandan agriculture experienced significant production increases, mainly by expanding the area being cultivated. But from the 1980s onwards, continuous population growth has caused extreme land pressures and deterioration of natural resource productivity, but also political conflicts have resulted in lower yields and a decline in agricultural growth. The 1994 civil war caused the destruction of infrastructure in rural areas. Large sections of the population were displaced, cattle were lost, and planting material and rural infrastructure were all damaged. The new government made the resettlement of refugees, conflict prevention and reconstructuring of the economy its first priorities. In 2004 the GoR adopted a strategy to transform Rwandan agriculture from subsistence-level to market-oriented farming by developing commodity chains and

[26] This text is mainly based on ICRA study results presented in Fané et al., 2004.

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agribusiness, professionalizing agricultural producers, establishing partnerships between the public and private sectors and civil society, and by promoting sustainable production systems (MINAGRI, 2004). These strategic choices are in line with the observed post-conflict dynamism of Rwandan civil society organizations, including FOs, which are based on longstanding traditions in rural society.

6.3 Farming systems

The Ruhengeri and Gysenyi provinces are situated in the northwest of Rwanda at the frontiers with Uganda and the Democratic Republic of Congo. Population density is high, at more than 500 habitants/km^2, and agricultural activities provide 90% of the population with income. Agro-ecological situations are very diverse and include rich soils derived from the volcanic chain. Policies for promoting potato production initially targeted the volcanic soils where yields (at approximately 110 kg/are) are twice that of other soils. Potato production also spread to other zones because local urban markets developed over time and smallholders easily adopted crop-production techniques. A survey of potato producing farmer households indicated that up to 85% of the farmers rent and own land (<3 ha). They rely heavily on family labour forces, get income from selling surplus production and renting out labour, invest in renting and buying land, and all have small cattle, while some also have large cattle.[29] Most of the potato crop is marketed (around half of the smallholders' production), some is consumed (around one quarter) and the remainder is kept for seed (another quarter).

6.4 Actors in the potato production and marketing chain

Seed production and input supply

The national agricultural research institute *(Institut des Sciences Agronomiques du Rwanda*, ISAR) has long experience in breeding high-yield potato varieties that are resistant to pests, and in producing quality 'breeder' seeds. With donor support, the Ruhyengeri research station built new greenhouses for improved potato seed production and relaunched on-station and on-farm trials. The national seed service *(Service National des Semences*, SNS) is the next operator in the seed chain; using improved seed material from ISAR it produces foundation seed for further multiplication by producers. SNS provides technical support to these producers and supervises certification of registered potato seeds.

In both provinces, registered potato seed producers have been grouped into two cooperative type structures to organize logistics for input supply and the sale of

[29] According to IFAD/MINAGRI (2004) the destitute and landless (who are not included in this survey) make up 12% of the Rwandan population. Generally spaking, family farms are poverty stricken and the food poverty level depends on the size of the farmholding and cattle.

potato seed material. The *Coopérative de Développement Agriculture, Elevage et Foresterie* is a private initiative that groups around 100 producers' associations that cultivate collective fields (a total of 60 ha) to produce registered seeds. The cooperative supplies credit that is reimbursed (i.e. deducted) when the cooperative buys registered seed from the producers. The *Association des Multiplicateurs de Semences Sélectionnées* is a seed producers' association initiated by NGOs and FOs. These NGOs also set up an alternative system for credit supply that is reimbursed by farmers 'in kind', rather than as money.

Agricultural inputs, fertilizers/pesticides and equipment for spraying potato seedlings are provided by private enterprises and small traders that are mainly present in urban centres. The potato producers considered access to input supply in rural areas as insufficient. In response, NGOs and FOs created a rural supply network by building stores in the potato producing zones. With support from NGO agents and FO technicians, the local FOs manage the stores where groups can buy inputs. Private input traders also created their own organizations to improve access to inputs.

Potato production, research and extension services

Since the end of the 1990s the NGOs, agricultural extension services and FOs have strived together to improve potato production and marketing as an income source for farm households. Under this joint initiative, potato producers' federations were created in Gisenyi province (1999) and in Ruhengeri province (2002). The two *Fédérations des producteurs de pomme de terre* that are based on the local farmer groups, *intergroupements*, have representatives at all administrative levels: at sector level (with an elected management committee), at district level (with technical committees that work on issues such as credit supply and production technologies), and at provincial level (where a group of technical committee representatives lobbies for potato producers).[30] The federation still receives substantial financial assistance from NGOs, which also provide technical support.

The national agricultural research institute (ISAR) has regional research centres in each of the major agro-ecological zones and research stations all over the country. ISAR provides information and develops appropriate technologies for the agricultural sector. Since 2002, ISAR has been implementing its strategic plan to transform the institute into a sustainable organization that plays a key role in agricultural innovation by establishing links with other actors (ISAR, 2002). ISAR is represented in the two provinces through a 'regional innovation centre' at Ruhengeri town, which facilitates consultation between researchers and other sector stakeholders.

The Ministry of Agriculture's extension service is represented (at provincial level) by a *Direction* and (at district level) by an agricultural extension agent

[30] Rwanda is divided into provinces *(Intara)*, districts *(Uturere)*, sectors *(Imirenge)* and cells *(Utugari)*. The districts form the basic political-administrative unit of the country.

(Responsable du Service Agricole du District, RSAD). The extension service suffers from a severe lack of human and financial resources. Over the last decade, development projects, NGOs and FOs have become involved in extension services, by recruiting agents and training voluntary farm extension workers.

Storage, transport and marketing

Potato marketing is handled entirely by the private sector: small traders who buy directly from potato producers and sell to larger, urban-based, traders. The small traders collect potatoes in areas where accessibility is difficult (steep hills and bad roads) and thereby reduce transaction costs for large traders. In order to improve trade flows, *intergroupements* of potato producers have built potato collection and storage facilities and undertake collective activities for sale and transportation; respectively in Ruhengeri province through the *Coopérative d'Exploitation et de Création de Marchés Agricoles* and others, and in Gisenyi province through the *Coopérative Ibukwa Muhinzi*. These group actions allow distant potato producers' groups to sell their produce.

A national price committee *(Commission de fixation du prix de la pomme de terre)* comprises representatives of state services (including the agricultural extension service) and other operators within the potato production and marketing chain such as: traders, transporters and producers. Every year this committee agrees on a fixed price per kg for Irish potatoes, regardless of the quality.

6.5 Farmers' organizations[31]

In Ruhengeri and Gisenyi provinces farmers have a tradition of organizing themselves at local level into membership-based entities: multi-purpose *associations*[32], cooperative-type groups called '*groupements de base*'; and loosely organized *intergroupements* that consist of several associations. Farmers mainly organize themselves around agricultural production-related activities, thus allowing them access to credit facilities. At the sector and district levels, single *(coopératives)* and multi-purpose *(associations)* FOs, both with member organizations, have emerged as a result of farmer-led initiatives, which focus on both crop production and marketing. Sustainability of cooperatives largely depends on both the income-generating capacity of production and marketing chains and the management capacity of the cooperatives. Private or state-owned enterprises trading commodities such as tea and pyrethrum, have already gained extensive experience with organizing

[31] Based on overviews presented in Bingen and Munyankusi (2002) and MINAGRI/CTB (2005).

[32] Associations are relatively small (10-50 members), their members live in a small area and have their fields close to each other. They engage in a multitude of activities but without mobilizing sufficient capital to ensure a minimum level of sustainability (Bingen and Munyankusi, 2002).

producers into *associations* and *groupements* to manage supply operations within these commodity chains. In the 1990s (after the civil war), *associations* were reorganized or newly formed to stimulate self-help groups in the post-conflict situation.

Apex organizations have now emerged (at provincial and national levels) such as farmers' syndicates and producers' federations. They often receive financial and technical support from NGOs and donor agencies and recruit technical staff to provide support services to members and capacity strengthening of FOs. IMBARAGA is the most important FO, and operates as a syndicate in both provinces. This syndicate, organized on a farmer membership basis and with branches at sector and district levels, was created in 1992. In 2003 IMBARAGA had a registered membership of around 65 000 farmers and it presently employs 23 staff. IMBARAGA initially focused on advocacy and lobbying on behalf of smallholder farmers, but over the years it has also developed service provision activities for its members. The syndicate cooperates with two NGOs (the *Bureau d'Appui aux Initiatives Rurales* and the *Forum des Organizations Rurales)*, which are involved in capacity strengthening of FOs and manage donor-funded rural development projects.[33]

6.6 Farmers' organization initiatives for linking actors

Seed production and input supply

Research (ISAR), seed services (SNS), cooperatives and private producers now work closely together to ensure a smooth flow in the production of breeder, foundation and registered potato seeds. Still, the quantity of registered seeds produced does not meet demand. These input operations are strictly regulated by laws, norms and rules and are an almost exclusive domain of state-owned services. This is one of the reasons (in addition to the expense involved in purchasing registered seed material) that potato farmers hold part of their own production for seed supply. This practice consequently affects both production and quality.

Farmers mention that access and prices limit the use of fertilizers and inputs. This is especially valid for the smaller farmholdings (<3 ha), which represent over 75% of all potato producers. Furthermore, low-quality inputs do not incite farmers to buy. FOs, NGOs and private enterprises are all striving to improve these supplies by setting up stores in rural areas to improve access to inputs and to start contracting quality input supply.

[33] IMBARAGA, INGABO (another Rwandan farmer syndicate), BAIR and FOR (NGOs) are members of a national network, the *Réseau des Organisations Paysannes au Rwanda*. ROPARWA facilitates lobbying and advocacy activities and provides support (training and information) for project management.

Potato production, research and extension

According to an extensive survey[34], potato producers face numerous problems relating to production and storage that affect both the yield and quality of potatoes. They feel that the technologies offered by research and extension services are dated in terms of soil and water conservation measures, potato varieties, organic fertilizer production techniques, and chemical fertilizers. Farmers also have little knowledge of potato pests and products for treatment, and potato-conservation techniques have not been developed at all. In general, it is felt that research and extension do not provide farmers with technologies that are affordable and attractive under the various agro-ecological and socioeconomic conditions.

FOs, as well as research and extension services, have explored new ways to provide solutions to these problems via lobbying and common initiatives. IMBARAGA staff and researchers from ISAR started on-farm trials with producers to study potato varieties and fertilization techniques. On a more extensive scale, the district agricultural extension service and IMBARAGA technicians developed a training-of-trainers programme for Ruhengeri: they trained members of the potato producers' federation, who then trained other member producers. IMBARAGA also developed a farmer-to-farmer extension programme. In consultation with local FOs, farmers are selected on the basis of key criteria such as leadership ability, being proven technology innovators, and having good communication skills. IMBARAGA technicians train these selected farmers, who serve as voluntary extension agents and organize meetings of associations (both community-based and commodity-based, e.g. potatoes) around specific demonstration plots. The voluntary farm extension agents receive no financial remuneration and plan their own activities.[35]

Storage, transport and marketing

Marketing-related activities are managed entirely by farmers and traders, and are regulated through delivery contracts between potato producers' organizations and traders. IMBARAGA and the federations introduced delivery contracts, and these contracts considerably improved the efficiency of operations. Still, contracts could be improved by including specifications concerning the delivery time and the quantity/quality of products. Farmers tend to harvest potatoes prematurely in order to earn some early cash, but this practice negatively affects potato storage quality, which causes losses for traders.

[34] Fané et al., 2004.

[35] Experience presented during the Ruhengeri workshop of the 2005 MINAGRI/CTB consultancy mission.

6.7 Main constraints and challenges for farmers' organizations

Producers feel that norms for foundation and registered potato seed production are not adapted to the conditions of most Rwandan farmers.[36] This forms a barrier for private producers to undertake this activity and thereby increase certified seed production capacity. Transferring the production of foundation seeds to the private sector (farmers' groups, individual farmers, etc.) is feasible by adapting existing regulations, communicating them to producers and reinforcing their technical skills.

Access by farmers to fertilizers and pesticides is being improved by building up a network of rural stores. Grouping orders together and other cooperative-type management practices by FOs, as well as testing tender producers, can create conditions for negotiating lower input prices. Still, quality control is considered a regulatory function of the state that should be further reinforced and should be the core business of the national seed service (SNS).

Although ISAR has deconcentrated research and therefore the transfer of useful information and technologies to farmers, this is still weakly organized. Socioeconomic conditions (e.g. land tenure, access to inputs and markets) are the determining factors in technology adoption. Farmers and extension agents feel that the responses from agricultural research to real and urgent on-farm problems and needs are too slow and not always well adapted. Decentralizing research management, developing demand-driven approaches for priority setting and planning, putting greater emphasis on adaptive research, and pro-active transfer and adoption assessment of technologies are all strategic options to be undertaken by ISAR, which offers possibilities for FOs to become partners. With their strong grass-root links, FOs can also point out the diversity of factors that influence rural innovation processes.

All key actors involved in research and extension are aware that several extension approaches currently coexist in the two provinces: an agricultural extension service-led approach that is still inspired by the 'transfer of technology' philosophy (RSAD); plus an evolving agricultural research-organization-led approach, which is inspired by farming systems research, with participatory and interactive elements (ISAR);[37] and a farmer-led approach that is based on voluntary farmer extension workers (IMBARAGA). This last approach is innovative, by adopting the APVC perspective and integrating market norms and standards with which agricultural products and technologies must comply. A first assessment of the farmer-to-farmer approach shows that its impact is limited by the lack of financial remuneration and weak links with research for (new) knowledge input.

[36] For example, producers of registered potato seeds should have at least a 20 ha holding in order to allow a four-year rotation of at least 5 ha.

[37] The ISAR Transfer of Technologies Unit became operational in 2004.

However, the coexistence of several extension approaches is in itself not considered an obstacle to smooth and effective knowledge and information flows. On the contrary, it is the start of a more pluralistic agricultural extension and advisory system that needs strong (but decentralized) coordination in order to clearly articulate the needs of the various production chains and local development stakeholders (input suppliers, producers, transporters, traders, local governments, etc.). However, there is still no specific forum where stakeholders can interact to discuss their requirements.

Quality incentives for producers are considered weak and hamper further chain development. Survey results show that defining a fixed potato price for 'equity' reasons does not work in practice: prices depend on distances between collection points and markets as well as rural road conditions, and are negotiated according to the quality of potatoes. Both traders and producers agree that they should include price differentiation in contracts. Premature harvesting of potatoes highlights problems concerning an affordable credit system. Some Rwandan FOs manage their own savings and credit programmes, but with mitigated results. Lobbying for infrastructure development and outsourcing the management of credit supply create better conditions for more equitable access than simply fixing single prices.

7 Farmers' organizations and agricultural innovation in Tanzania. The sector policy for real farmer empowerment

Ninatubu M. Lema[38] *and Barnabas W. Kapange*[39]

7.1 Introduction

Over the past decade, agricultural sector reforms in Tanzania have been characterized by strong decentralization and deconcentration. Agricultural research was largely deconcentrated to the zonal level, while agricultural extension was deconcentrated and eventually decentralized to the district level. Tanzania's main public agricultural research organization, the Department of Research and Training (DRT) coordinates seven deconcentrated Zonal Agricultural Research and Development Institutes (ZARDIs). There are also a number of national thematic and commodity research programmes and institutes, some of which are partly privatized (coffee, tea and tobacco), while others have relative autonomy and are financed by the sectors concerned. The ZARDIs have a long history of working with farmers' groups such as farmer research groups (FRGs), farmer extension groups (FEGs) and farmer field schools (FFSs). Since 1998, farmers have been represented on the various zonal-level research planning committees.

The next phase of the Agricultural Sector Development Programme (ASDP) is expected to support both agricultural services and investments across all levels (national, regional and district/local) and will be implemented by the Agriculture Sector Lead Ministries (ASLMs[40]). ASDP will be financed through 'basket funding' (i.e. joint donor and the Government of Tanzania (GoT) and farmer empowerment will play an important role. Although client-orientation of agricultural services has improved significantly during the last decade, serious shortcomings (mainly related to the lack of specific farmer empowerment) have resulted in poor downward accountability. The poor past performance of extension (and research) partly led to the revision of the Tanzania Rural Development Strategy (RDS) and subsequently to the reformulation of ASDP, with renewed emphasis on accountability for performance and farmer

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[40] ASLMs include the Ministry of Agriculture and Food Security (MAFS), the Ministry of Water and Livestock Development (MWLD), the Ministry of Cooperatives and Marketing (MCM), and the President's Office – Regional Administration and Local Government (PO-RALG).

involvement in AR&D priority setting and resource allocation. The role of farmers in AR&D, through both formal and informal FOs, can be analyzed from two perspectives:

i the role of community-based farmer groups in agricultural innovation; and
ii the representation of farmers in decision-making bodies at higher levels (national, zonal and district levels).

7.2 Policy context

Agricultural research in Tanzania has a long history dating back to the colonial era. It started with the main emphasis on cash crops, but after independence the main food crops were given higher priority. After a broad reorganization of the NARS in 1989, two major World Bank funded projects, the Tanzania Agricultural Research Projects (TARP I and II) and the National Agricultural Extension Projects (NAEP I and II) were implemented over a period of about 14 years. By adopting the farming systems approach, these two projects strongly emphasized demand-driven research. More recently, the GoT and the private sector have taken several initiatives to involve farmers and FOs more intensively in agricultural innovation. The main intention has been to empower farmers and the other actors involved to articulate demands for services that will improve their livelihood security and to involve them in decisions regarding the allocation of resources to respond to their demands.

The current overall objective of AR&D in Tanzania is to promote sustainable food security, income generation, employment growth and export enhancement by developing and disseminating appropriate and environmentally friendly technologies, with an emphasis on sustainability of production systems and maintaining the productivity of natural resources.

At the end of TARP II, the NARS in Tanzania was aiming at the following broad characterization:[41]

- Demand-driven research: stakeholders set the research agenda and influence the selection of research projects and resource allocation.
- Diversification of research supply: a greater number of qualified technology suppliers play a role and compete for resources through competitive agricultural research funds.
- Diversification of demand: not only public extension, but also farmer groups, FOs, the private sector, agro-industry and NGOs express research and information needs.
- Focus on adaptive research: the ZARDIs concentrate on adaptive research and producing appropriate technologies that address the aforementioned local stakeholder priorities.
- Sustainability: research institutes are increasingly financially sustainable because their research is funded from other sources, not just from government funds.

[41] According to the TARP II Project Completion Report (World Bank, 2003).

In order to achieve these objectives the involvement by farmers and other NARS clients in conducive organizational arrangements has proven to be critical. However, there was no social capital at the community level for effective and demand-driven technological innovation.

7.3 Key actors in agricultural innovation

The main players in the Tanzania NARS are the national agricultural organization, the Department of Research and Development (DRD) of the MAFS, the agricultural universities, privatized research institutes and private-sector AR&D. However, the challenge of actually using innovations includes many other actors that are involved in formal and informal research and technology adaptation and dissemination activities, such as extension services, NGOs, the private sector and those involved in the actual adoption and use of the information and technologies. The end-users (i.e. companies and farmers) are the key players in innovation. FOs organize and represent farmers in agricultural innovation.

7.4 Farmers' organizations

Several formal FOs exist in Tanzania. Farmers no longer consider the traditional umbrella organization (the Tanzania Federation of Cooperatives), which is organized into cooperative unions, as providing reliable advocacy. As a result, MVIWATA emerged in 1993 as a new representative network of farmers' groups, with NGO status, representing around 60 000 farming households. MVIWATA aims to ensure effective representation of farmers' interests and takes part in a number of national fora for the agricultural sector. MVIWATA and its local networks are strongly involved in AR&D and actively approach many different sources of information and knowledge-for-innovation sources. MVIWATA has developed experience with farmer-to-farmer knowledge exchange for innovation and the contracting of agricultural services. Apart from MVIWATA, which is the only multi-issue FO, other specialized FOs exist that focus on particular commodities. In relation to coffee research there are several such FOs, some resulting from the old cooperative sector, such as the Kilimanjaro Native Cooperative Union (KNCU) and Tanganyika Coffee Growers Association (TCGA), others from the newly developing specialty markets overseas such as the Association of Kilimanjaro Speciality Coffee Growers (AKSCG). Representatives of some of these FOs have become board members of privatized coffee research bodies such as the Tanzania Coffee Research Institute (TACRI).

Since Tanzania's structural adjustment phase during the mid-1990s, there has been a pressing need at Local government authority (LGA) level to develop a pluralistic approach to service provision and effective local interaction with farmers that creates an enabling environment for the private sector and civil society organizations to expand their roles in agricultural innovation. Many NGOs are involved in farmer empowerment, group formation, adult education and technology transfer. Some area-based development programmes, as well as NGO-supported projects, have experimented with improving access to

technology for poorer smallholders through farmer empowerment and through carefully targeted investments aiming to deliver public goods and rectify market failures, especially in drought-prone and risky areas. Tanzania has a rich diversity of farmers' groups with many purposes, which have been in existence for many years. Many agricultural development projects have facilitated group formation and worked with farmers groups in various ways, often building on indigenous, mostly informal village producers' groups. Not all of these groups are genuine and some exist only for a particular project.

Some groups are legally registered entities with strong binding governing constitutions (e.g. the seed growers' associations in the Lake Zone and FFS groups in Bukoba, Morogoro and Mbinga districts), while others are legally registered under the Cooperatives Act (No. 15, 1991), or simply listed by the Community Development Department (CDD). A range of legal mechanisms exists for group registration, including as cooperatives, associations or trusts (URT, 2004). However, few informal groups are actually registered and there are no formal registers available concerning the numbers of such groups, although many surveys record their existence and activities. Informal groups have neither a legal status nor written constitution. It is increasingly the policy and practice of district agricultural service providers (ASPs) to work with groups. The ZARDIs are an example: they have large mandate areas that include many different agro-ecological and socioeconomic environments. In order to achieve improved coverage and a farmer-focused research system, FRGs were formed to represent different environments. Having a relatively limited number of sites on which to focus has helped the ZARDIs to implement, monitor and evaluate the on-farm research activities more effectively. As partners in adaptive research the FRGs became platforms that provided feedback from farmers to researchers and other stakeholders. Since both farmers and extension staff collect most on-farm research data, this approach has contributed to greater efficiency and better sharing of experiences among stakeholders (Lema et al., 2003). However, nearly all of these groups involved in AR&D are facing a core problem of insufficient organizational capacity. Another prominent feature of most of these groups is the weak resource base and their poor access to rural finance.

7.5 Farmer representation

In research and extension service provision, farmers have become members of a wide range of planning and decision-making fora. At national level, farmers are part of the National Agricultural Research Fund (NARF) board as well as steering committee members of a large World Bank funded Participatory Agricultural Development Programme (PADEP). At zonal level, two farmers are members of the 10-person Zonal Agricultural Executive Committees (ZAECs). Farmers are also members of Zonal Technical Committees (ZTCs) and Zonal Agricultural Research Fund Management Teams (ZARFMTs); in the latter case, sometimes as FO representatives.[42] Research priority setting starts

[42] See Tanzania case studies in Heemskerk and Wennink (2005).

with researchers receiving specific requests from farmers or groups. These requests are then translated into draft research proposals and presented at the annual zonal Internal Programme Review (IPR) meetings, which are attended by researchers, farmers, extension agents, NGOs and policy makers. The IPR reviews the proposed AR&D projects to ensure that they are demand-driven and address farmer priorities, while also taking into account total resource availability (zonal, national, public, private etc.).

Although farmers have some influence in these zonal committees this is relatively weak, and is similar to that of the farmers' groups at community level, which are also involved (to some extent) in decisions concerning the research focus. This situation is partly caused by research institutes managers selecting farmers on the basis of proposals by the government's regional agricultural office rather than the farmers themselves deciding who should represent them. Many of these selected farmers largely represent their own personal interests and concerns, and contribute little to real downward accountability of ASPs. Another problem is that not all farmers are yet organized into groups; those who are organized are not yet formally recognized, and all face an across-the-board capacity problem. The situation at district level is slightly better in the sense that representatives of FRGs, FEGs or FFSs are occasionally invited to attend district fora.

7.6 Farmer empowerment

The Tanzania rural development strategy highlights the need to transform and diversify agricultural and livestock production towards prevailing patterns of demand in local, regional and international trade. It also focuses on strengthening capacities to investigate and identify investment potentials in a more liberalized and competitive economic environment, and outlines the government roles at each level. Participation by the private sector, civil society, and rural communities is crucial in implementing rural development strategies. The Agriculture Sector Development Strategy (ASDS) focuses on agricultural productivity and profitability, as well as on promoting private sector, public sector and processor/contract-grower partnerships, and on the participatory implementation of the strategy through District Agricultural Development Plans (DADPs). To complement the strategic priority areas identified in the ASDS, it envisages investments through three sub-programmes:

i activities undertaken at a local (within district) level;
ii activities that are public sector functions at the national (and zonal) level in support of agricultural development, including interventions concerning the policy and regulatory framework, research, advisory services and training, private-sector development, support to marketing and rural finance; and
iii cross-cutting and cross-sectoral issues such as gender, HIV/AIDS and environment, land tenure, rural infrastructure, energy, education, etc.

Farmer empowerment is a precondition to successful partnerships between farmers and their groups and organizations on the one hand, and public, private and community-based ASPs on the other. It is also essential for ensuring

effective client participation in formulating and implementing Local Agricultural Development Plans (LADPs). Farmer empowerment for agricultural innovation in Tanzania has two components (URT, 2005):

- Strengthening farmer empowerment. Through knowledge, control of funds, influence on organizations and institutional change, farmers can then acquire the capacity to better analyze their constraints and identify opportunities, articulate their specific needs, exchange knowledge, access the services they need, become active AR&D partners, and improve their bargaining power.
- Strengthening FOs. Farmers or community-based organizations and networks should be promoted and strengthened to become key development partners.

7.7 Participatory planning at district level

Planning guidelines require that LADPs originate from villages and are synthesized at district level. In some regions, Ward Facilitation Teams assist communities to develop plans through participatory processes as well as providing backstopping services in the wards. However, experience shows that these LADPs are often prepared at district offices and seldom involve real input from other stakeholders, including farmers. Such plans often do not address farmers' actual needs. In many situations, new technologies are still developed and disseminated using conventional research methods rather than participatory approaches; as a consequence many farmers continue to rely on their traditional practices. This is thought to be partly due to the fact that researchers and extension agents are insufficiently conversant with participatory problem-solving and decision-making tools and communicate badly. Farmers do not actually control decisions on the planning and implementation modes of AR&D activities. Inadequate rural financial services have made it difficult for farmers to access credit and hence they fail to adopt and/or utilize improved technologies that are capital-based, e.g. seeds, fertilizers and farm equipment (URT, 2004). This situation underscores the need to follow a much more comprehensive agricultural innovation approach.

7.8 Monitoring and evaluation

Under the local government reform, M&E is supposed to be conducted in a bottom-up fashion, from village, ward and district up to national levels. However, as yet M&E is mostly conducted at national and district levels without much involvement by farmers and other key stakeholders. There is no emphasis on participatory M&E. The monitoring indicators are also not clearly defined and are not fully understood by the key stakeholders. In addition, people in most districts have no instruments or tools that they can use for monitoring research and extension activities.

7.9 Main innovation challenges for Tanzanian farmers' organizations

Tanzania has a rich tradition of organizing its farmers. The FOs are formed with varying objectives according to levels of development that vary widely across the country. However, there is no defined coordination mechanism for

FO formation, operations and evolution, and their overall impact on AR&D decision-making processes can therefore not be easily evaluated. Furthermore, there are many FOs that do not take advantage of the assistance offered by rural (public) service providers because such FOs tend to operate informally and do not comply with official legal requirements. Also, when organizations are formed under resource support from external forces, they tend to lose sustainability once that external support is phased out.

Farmer group establishment and organization has been particularly strong in areas with a large concentration of externally funded projects, implying that external initiatives (including logistics support and sensitization to support the organization process) are helpful in initiating the process. The primary focus behind such group formation is to serve members' interests and enable them to make decisions, while projects tend to see FOs as instruments for increasing the effectiveness of technology generation and diffusion. They often provide more relevant extension services to members and link them better to both public and private ASPs. However, the formation is often carried out by outside agents of change, as a vehicle for reaching many farmers in a cost-effective manner (and thus also useful to achieve the objectives of the outside agent). This external drive has often led to unbalanced farmers' groups and organizations that are dependent, unstable and (after external assistance ends) have few resources. The main challenges therefore concern:

- reinforcing the resource base of these organizations;
- creating links with grass-root institutions to provide backup and represent farmers' voices; and
- forming groups and organizations beyond the traditional associations based around crop production.

As for agricultural innovation, institutional factors strongly influence the uptake and further development of agricultural technologies by poor farmers. Technological innovations can facilitate changes in farmers' institutions and these institutions can significantly influence the process of technology generation and adoption. Therefore smallholder farmers must organize themselves to improve their access to technology through representative organizations (farmers' unions), legally registered bodies (such as cooperatives, savings and credit unions or water users' associations), or special-interest farmers' groups (formed to receive advice or facilitate the processing/marketing of produce). The overall challenge is to develop capacity with farmer groups, local networks and FOs for active representation in decision-making fora and resource-allocating bodies. At the same time, a capacity within ASPs needs to be developed so that they actually listen to farmers' representatives.

8 Networking for agricultural innovation. The MVIWATA national network of farmers' groups in Tanzania

Laurent Kaburire[43] *and Stephen Ruvuga*[44]

8.1 Introduction

The previous section has highlighted the recent policy changes in the agricultural sector in Tanzania and, in particular, the role of FOs in relation to research and extension. To a large extent public financing for research and extension is being made conditional on a strong collaboration with farmers and FOs. Many FOs have emerged that are attempting to help address the multiple challenges faced by farmers – in agricultural and livestock production in general, and the need for innovation in particular. Nevertheless, there continues to be inadequate farmer participation in decision-making throughout the entire AR&D process, whether these innovations are technical, organizational or institutional. However, FOs have significant additional potential to make the research and extension agenda more relevant to farmers' needs and their environment, and indeed in bringing about the desired changes in agricultural productivity, incomes and sustainability. Because MVIWATA is one of the oldest Tanzanian FOs and has been involved in the agricultural innovation process since its establishment, lessons can be learned from its experience.

8.2 MVIWATA

MVIWATA[45] is a national network of farmers' groups in Tanzania, and was established in 1993 by small-scale farmers from the Morogoro, Iringa, Tanga, Mbeya and Dodoma regions (in the centre, southwest and northeast of Tanzania) who wanted to establish a farmer-to-farmer exchange forum. Sokoine University of Agriculture (SUA) at Morogoro guided and facilitated its establishment, which finally led to formal registration of the organization in 1995. MVIWATA's mission is to link farmers' groups and local networks of such groups together into a sound and strong national FO capable of ensuring representation and advocacy of their interests in decision-making processes at all levels. MVIWATA's overal objective is to develop a strong and effective representation of farmers' interests in jointly confronting their needs and challenges, mainly concerning participatory communication, lobbying and

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[45] MVIWATA is the acronym for *Mtandao wa Vikundi vya Wakulima Tanzania*.

advocacy, plus organizational strengthening to provide agronomic and marketing services. MVIWATA advocates strong organizations for smallholder farmers, establishing reliable markets for their farm produce, sustainable financial and technical advisory services, as well as empowered representation of farmers at all levels.

In many areas MVIWATA is strongly represented at the village level; small-scale farmers (irrespective of age, gender, farm type, religion, geographical origin, or political opinions) can become members and hold responsible positions in the organization. MVIWATA has five organizational levels: individual members; local farmers' groups; local networks; intermediate level networks; and the national level (with headquarters in Morogoro). MVIWATA operates under the motto '*Mtetezi wa Mkulima ni Mkulima Mwenyewe*', which literally means 'defender of farmers' interests by farmers themselves'. The organization has members in more than 100 local networks with some 1 000 affiliations. Network size varies from 5-70 affiliated farmer groups, each with an average of 5-200 members. Farmers are all small-scale farmers and can be members through their groups (presently 60 000) or as individual members (10 000 cardholders).

8.3 Links with key actors

All actors in the NARS, from policy makers to AR&D institutions (both public and private) and FOs (such as MVIWATA) play a role in agricultural innovation, which involves efforts to improve the current practices in agricultural production, processing, organization and marketing. FOs also play a role in collecting and disseminating practical and technical information through formal and informal networks within their structure. In order to be relevant to the clients' formal or generic needs, agricultural research organizations need to become more client-oriented and demand-driven; this can be greatly facilitated if clients are organized and their demands are properly articulated.

Innovation involves new products, processes or changes to existing products or processes. The speed with which firms and clients adopt new technology and information, and which largely determines its final impact, depends on its relevance and the constraints of the marketplace (e.g. availability of inputs, access to credit, markets, etc.). Participatory group approaches have become common in most rural development initiatives. These groups can be self-initiated ('self-help' groups), or initiated with support from government services, AR&D projects, NGOs, commodity-based farmers' groups or producers' associations. Considerable on-farm research and adaptation involving farmers and farmers' groups is often required before an innovation becomes fully relevant and can be easily adopted.

MVIWATA plays an important role in innovation and links up (both nationally and internationally) with actors relevant to rural development and agricultural innovation. MVIWATA is recognized by farmers and other stakeholders as a credible, independent, and democratic membership organization with elected

representatives. MVIWATA works closely with agricultural AR&D organizations[46] and is a member of several national steering committees and boards.[47] Internationally, MVIWATA also networks with other FOs[48] and has links with many NGOs and funding partners. One of MVIWATA's strong points is its credibility with both farmers and other agricultural innovation stakeholders who recognize the organization as independent from the government and publicly financed services. The organizational structure is democratic with effective control of the organization by members and their elected representatives at local and national level being recognized in the MVIWATA statutes.

8.4 MVIWATA's overall strategy

MVIWATA carries out the following operational activities:

- Strengthening local groups and networks through motivating self-reliance attitudes and encouraging farmers to defend their own interests. MVIWATA trains farmers on collective action for poverty reduction in rural areas, without becoming government or donor dependent. Training aims at capacity building of the members involved in the network.
- Provision of participatory training skills to network members through extension services and study tours. Training is targeted at leaders appointed by their respective groups to attend the courses. After completion of the course, these leaders are required to provide feedback to their respective groups and networks so that the knowledge they have gained can be disseminated to all members.[49]
- Support to sustainable income-generating projects organized by members, by encouraging and assisting farmers to form their own savings and credit groups.[50]
- Construction and rehabilitation of rural infrastructures, including rural training centres, market structures, feeder roads and bridges to improve access to markets.[51]
- Membership affiliations with national and international network organizations as part of lobbying and advocacy activities. MVIWATA has created partnerships with many social and civil society organizations, both

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46 Such as INADES-Tanzania, PELUM-Tanzania, Southern Highlands Development Project, Cooperative College Moshi, SUA, Tanzanian Association of Non-Governmental Organizations, and the Agency for Cooperation and Technical Development.

47 The PADEP; the Agricultural Marketing Systems Improvement Programme (AMSDP); the ASDP Task Force; the Eastern Zone Client-Oriented Research and Extension (EZCORE) programme; and the Morogoro Livestock Training Institute (LTI).

48 East African Farmers Federation (EAFF); International Federation of Agricultural Producers (IFAP); and several national unions in Sub-Saharan Africa and Europe.

49 Up to now more than 600 farmers have been involved in national farmer visit exchange programmes and 70 Tanzanian farmers participated in farmer exchange visits to several foreign countries.

50 To date, 25 Savings and Credit Cooperatives (SACCOs) have been formed.

51 Especially in the Nyandira, Kinole and Tawa villages of Morogoro, and in Kibaigwa village, Kongwa district in Dodoma region.

inside and outside Tanzania (see above). Together with MVIWATA, these partners help farmers improve their local knowledge and develop strategies for poverty alleviation.
- Information management, dissemination and exchange by documenting farmers' experiences, and activities using other media, e.g. radio, television, booklets and newsletters. This work focuses on informing producers of agricultural innovations and organizations from which they may benefit.
- Providing a platform for lobbying and fundraising for agricultural and income-generating undertakings by members. After farmers have initiated their own development initiatives, MVIWATA tries to contact funding organizations in order to support and strengthen these initiatives.

8.5 MVIWATA's approach to agricultural innovation

Relying on local farmers' groups and networks

One of MVIWATA's key institutional innovations involves forming a network of farmers and groups in order to create fora for communication, information exchange and sharing experiences.[52]

MVIWATA uses a bottom-up participatory approach in which farmers fully participate in designing and implementing innovative technologies and approaches for enhanced agricultural productivity. The methods used include community meetings and open group discussions to reflect on the situation of farmers, reveal their challenges, inventory farmers' own capabilities, identify constraints and decide on actions that can be taken. MVIWATA therefore builds up farmers' capacities to recognize their own capabilities and identify solutions within their own means. In this way MVIWATA strengthens local farmers' groups and networks by motivating self-reliance attitudes. MVIWATA trains farmers on how to join together in order to be in a better position to decide which development programmes they themselves can initiate in the fight against rural poverty. The organization establishes farmers' groups and networks to help farmers solve socioeconomic problems without waiting for conditioned grants or gifts from donors.

With regard to agricultural AR&D, two sides are always emphasized simultaneously: in marketing terms it is important to have at least a potential market for a new product or process; and in productive terms, relevant technologies are required (this may mean generating new scientific and technological information, or just using adaptive research and dissemination). Through the initiatives of MVIWTA and its partners, farmers' groups carry out income-generating activities such as: SACCOs, inputs supply, vegetable and fruit production/processing, raising dairy livestock, producing tree seedlings etc.

[52] MVIWATA has documented and disseminated this experience, in collaboration with INADES (African institute for economic and social development).

Valuing indigenous knowledge and adoption of improved practices

MVIWATA also emphasizes attitude and perception changes that aim to improve the value of farmers' indigenous technical knowledge and take advantage of such know-how in adapting new technologies. MVIWATA encourages formal research to improve indigenous knowledge already practiced by farmers in order to make agriculture more rewarding. In this context, developing new products and processes through innovation focuses on the needs of the clients, placing particular emphasis on user participation in decision-making and evaluation of innovative technologies.

Some agricultural innovations that have recently been adopted by MVIWATA farmers' groups include the replacement of conventional cultivation systems involving frequent ploughing and tillage to 'conservation agriculture'. For example on the slopes of the Uluguru Mountain in the Morogoro Region, farmers have adopted improved soil conservation measures (such as terracing and contour bund farming, row cropping across the slope and agro-forestry practices), as well as zero and rotational grazing. They have also introduced new crops such as tomatoes, Irish potatoes, and sunflowers, and have dug water distribution canals for better management of irrigated agriculture. In the drought-prone Dodoma Region, farmers have adopted techniques such as rainwater harvesting and agro-forestry, and are addressing soil fertility issues by leaving crop residues in the field and incorporating them into the soil to encourage nutrient recycling. In many areas farmers are successfully applying these improved technologies and have significantly improved their income levels.

Dissemination of farmers' knowledge and experiences

MVIWATA plays an important role in facilitating the exchange of farmers' practical and successful experiences, including the dissemination of farmers' best practices through written materials, radio programmes and newsletters; this includes work on technologies as well as on the management of dynamic groups.[53]

MVIWATA has several mechanisms for disseminating innovations, including:
- its own radio programme called '*Ijue Mviwata*' and various television programmes;
- booklets that document best practices;
- a quarterly newsletter on technology dissemination '*Pambazuko sauti ya wakulima*';
- training workshops that are held regularly to train farmers' leaders and trainers;

[53] Indigenous medicinal plants used to treat crop pests and diseases in the Dodoma, Singida, Morogoro and Mbeya regions have been documented by INADES in '*Kulima mimea shambani kwa kutumia njia za asili No 2, 1999*'. INADES, in collaboration with MVIWATA, also produced stories such as '*Mabise wa Magubike*'.

- local network meetings to discuss new information useful to farmers; and
- exchange visits during which farmers share their knowledge and experiences. These study tours expose farmers to different environments and sources of knowledge, while also allowing them to learn new technologies through interaction with other farmers who already practice these methods.

8.6 Results of MVIWATA's role in agricultural innovation

Recognition of farmer institutions

The results achieved by MVIWATA are evident in at least three areas. Firstly, farmers' knowledge is recognized as valuable and important information that is readily available; the effective use and incorporation of this information into improved technologies requires close interaction between researchers, extension staff, and farmers themselves. Secondly, it is becoming increasingly clear that institutional change is required for FOs to be positioned in such a way that they become meaningful representatives. Thirdly, farmers' groups have become deeply involved in facilitating the improvement of smallholder's livelihoods through income-generating activities for which innovation and hence knowledge is required (MVIWATA functions as the knowledge broker).

The farmer's voice

Farmers in MVIWATA farmers' groups are beginning to realize the need to raise their collective voice, as well as the importance of group work and collective action to improve their socioeconomic conditions. In MVIWATA's operating areas, farmers have become confident in addressing their problems and are involved in village and ward development committees. MVIWATA has representatives on steering committees and boards, and farmers have been involved in marketing board committees. The strengthening of local farmers' groups and networks has also enabled farmers to strongly interact with extension staff. Farmers in these areas have generally improved their ability to initiate their own development projects and take responsibility for implementation, monitoring and evaluation.

Income generation

Some of the farmers who have joined MVIWATA have improved their livelihoods, including their income-generating activities. On the other hand it is also realized that farmers often identify more urgent obstacles than technology development and dissemination (e.g. input access). The fact that MVIWATA's involvement in some situations does not appear to have an immediate impact on farmers' economic performance sometimes forms an obstacle to mobilizing support for agricultural innovation development programmes.

8.7 Main constraints and challenges for MVIWATA

Farmers united in MVIWATA have tried to ensure an effective representation of their interests. However, both MVIWATA and the majority of its members

are facing a wide range of challenges and bottlenecks that hinder agricultural technological innovation.

At the national level the gap between resources and ambitions results in an ongoing discussion by the MVIWATA steering committee on what should be the main priorities in assisting member farmers and groups. On the one hand, poor communication infrastructure for the farmer-to-farmer dissemination of information is hindering innovation development and trained network promoters often fail to reach the target farmers in a timely manner. On the other hand, the lack of sufficient market capacity to absorb increased supply is also a major challenge. The lack of adequate communication facilities and appropriate markets has contributed to failures in adapting and implementing otherwise relevant agricultural innovations. In areas with intensive agriculture, farmers often point to the poor quality and the lack of timeliness (of chemical input supplies) as important reasons for slow adoption.

Some farmers have misconceptions about the role of MVIWATA, confusing the services supplied by the network and the economic activities of the farmers' groups. Some farmers join local networks with a perception of obtaining loans or grants from the government or NGOs, rather than gaining knowledge, information and experience from extension service providers and/or other farmers[54]. However, MVIWATA does not provide funds to farmers, it only facilitates farmers' capacities to influence research and extension services providers, and provides access to training opportunities.

Group dynamics and leadership are sometimes also considerable barriers to innovation development and adoption. Some leaders of farmers' groups and networks are insufficiently competent to coordinate the agreed activities. Many farmers' groups and networks fail to achieve their goals due to the lack of coordination and, out of frustration, farmers then frequently decide to elect new leaders. Under such circumstances, it becomes difficult to make any real progress in technology transfer and adaptation.

Another challenge for small-scale farmers is the introduction of market liberalization, which leads to competition between producers in terms of the quality of farm products. The lack of financial resources to run a small business is a frequent constraint, particularly in combination with the lack of adequate skills and knowledge. SACCOs often do not save sufficient funds to meet the demand for seasonal loans and agricultural credit.

[54] For example, farmers from Sukuta village failed to implement and sustain their small farmer-owned projects due to lack of knowledge and, as a result of poor management, carried out no evaluation and monitoring of their development projects.

9 Linking farmers' groups with various agricultural service providers. The MVIWAMO district network of farmers' groups in Tanzania

Richard Masandika[55] *and Anselmi Mgangaluma*[56]

9.1 Introduction

The previous case study described in this bulletin concerned MVIWATA's approach and activities with regard to agricultural innovation. However, this study focuses on MWIVAMO[57], the first formally registered 'intermediate-level network'. MVIWATA, which works at the national level, could not render all services required. The need therefore arose for intermediate-level networks in order to reach members at the grass-roots level. Such intermediate networks are normally created at the provincial level but, in Monduli district, MWIVAMO started at district level with the ambition to expand to cover the entire Arusha region. This study aims to draw capacity development lessons from farmers' groups that hope to enhance links with agricultural service providers.

9.2 MVIWAMO

MVIWAMO was officially registered in March 2004, and its main aim is to strengthen farmers' groups and their economic base. MVIWAMO's specific objectives are to:
- establish local farmers' group networks (i.e. 'bridging' social capital);
- strengthen farmers' groups (i.e. 'bonding' social capital); and
- provide services to improve crop and livestock productivity, and provide services to strengthen farmers' economic situations.

The annual general meeting of voting members (450 in 2004, each having a membership card with voting rights), is MVIWAMO's supreme body. The voting members represent more than 2 500 members from 75 registered farmers' groups. As a membership-based organization, MVIWAMO leadership is vested into a Steering Committee, which includes the chairpersons of the organization's three sub-committees (Communication and Training, Planning and Finance, and Lobbying and Advocacy). The Coordinating Office, which is employed by the Steering Committee, manages MVIWAMO's daily affairs.

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[57] MVIWAMO stands for *Mtandao wa Vikundi vya Wakulima wa Wilaya ya Monduli*.

The general building blocks and point of intervention for MVIWATA is the farmer group (FG) with at least five FGs forming a local network (MVIWAMO has facilitated the formation of four local networks). The local network can be at village level, or higher. In Monduli, the lowest level for a local network was agreed to be the ward (sub-district), but several wards can also merge into one local network, depending on the number of active FGs. MVIWAMO targets small-scale farmers and agro-pastoralists in Monduli district, and has reached more than 70% of the farmers in the district.

MVIWAMO receives financial support from various donors[58] but also accumulates revenues from private donations and the sale of MVIWATA membership cards. MVIWAMO retains 50% of the membership fees, while the other 50% is transferred to the umbrella organization MVIWATA. MVIWAMO's Coordination Office and staff prepare activity and financial reports, which are discussed by the Steering Committee on a quarterly basis. Accountability is transparent through monthly reporting to donors and financiers. Annual physical (activity) and financial reports are tabled in the annual meeting, including internal and external audit reports.

9.3 Links with key actors

A stakeholders' identification sketch of the key actors involved in agricultural innovation in Monduli district resulted in a list of 16 key parties. These varied from formal public research and extension organizations to a wide spectrum of NGOs, both local and international, as well as private companies. MVIWAMO maintains links with most of these organizations at the local level. MVIWAMO supports and actively participates in the Monduli district NGOs network (MoN-net) and in the District Advisory Committee (DAC) coordinated by the District Council. The DAC consists of the NGO network, local government (District Council, the key local government development coordinating entity), central government (District Commissioner's Office), politicians (Members of Parliament for the district) and the private sector, and aims to coordinate development activities in the district, including AR&D. MVIWAMO is currently preparing formal cooperation agreements with the various actors from the public and private sectors. MVIWAMO also collaborates closely with other parties involved in public agricultural research, development and training.

9.4 MVIWAMO's approach to agricultural innovation

Overall strategy

Although MVIWAMO members form just a fraction of the Monduli population, the organization also affects the remaining community via a 'trickle down effect'. For example: a MVIWAMO member trained in potential technological innovations applies that knowledge, leading to improvement in his/her enterprise, which is then often copied by neighbours. Other strategies used by

[58] TRIAS-Belgium, European Union, and numerous others.

MVIWAMO to foster producer innovation include:
- the identification by local networks of 'successful model farmers' that can be emulated by other farmers;
- organizing study tours and exchange visits;
- the contractual engagement of extension officers[59];
- conducting workshops and seminars and thematic training sessions aimed at specific products (e.g. bee-keeping, vegetable growing);
- broadcasting information via MVIWATA's radio programme (these recently included radio programmes on formation/strengthening of FGs and local networks); and
- participating in agricultural exhibitions.

Institutional strengthening of farmers' groups

MVIWAMO contributes to the institutional strengthening of FGs by:
i mobilizing farmers to form their own groups and local networks;
ii thematic seminars and workshops;
iii organizing information exchange and study tours; and
iv lobbying and advocacy.

Local network members mobilize farmers to form their own groups (MVIWATA staff were previously responsible for this). Trained 'promoters' of local networks visit groups for orientational meetings, train farmers on the dynamics of group formation, and enable groups to join local networks.[60] The promoters operate as trainers of trainers in local networks within Monduli. They are accountable to their local networks as well as to MVIWAMO Steering Committee. Members of the local networks, as well as MVIWAMO members, have been trained on specific issues such as lobbying and advocacy, leadership, board membership, and NGO regulations. MVIWAMO believes that good leadership is essential for institutional strengthening of FGs. MVIWAMO assists FGs and networks to develop their constitution, which underlines identity and local structure but is also based on network guidelines.

The Cooperative College of Moshi, with backstopping by MVIWAMO, helps FGs to conduct participatory needs assessments and analysis to identify problems and potential solutions. Based on a 2003 needs assessment, the group held workshops on good leadership, strengthening of networks, and cost-awareness, as well as on farm-level bookkeeping, record keeping and market-orientation skills. Farmers were informed of the importance of being aware of basic knowledge and information necessary for determining the asking price of their produce. A base-line survey showed that almost 75% of all small-scale farmers

[59] Public extension officers are contracted to provide certain services on a variable cost-recovery basis.

[60] In 2004, 14 MVIWAMO promoters were trained at the Nyandira Training Centre in Morogoro, which is owned by MVIWATA and UMADEP (a project supported by SUA). Trainers included experienced farmer promoters. The costs were shared with farmers, who contributed time and travel fare for the six-week training course.

and pastoralists interviewed kept very poor records of their economic activities, and that various established participatory cost-benefit calculations showed a deficit. A follow-up workshop to design a cost-awareness training manual attracted MVIWAMO members and participants from District Council Departments, NGOs, and from various research and training institutions.

MVIWAMO promotes agricultural innovation through learning from fellow farmers who are successful. Depending on the theme selected by farmers, MVIWAMO has organized several exchange visits. The main costs are covered by MVIWAMO, including transport, food and accommodation and (sometimes) institutional fees. The main selection criteria for the participants consist of: the ability to give feedback to fellow members, membership of MVIWATA, and familiarity with the theme of the visit. The output from such visits include contacts and future direct communication by farmers with colleagues at the places visited. The effectiveness of these visits is monitored by MVIWAMO through follow-up visits and through local network meetings.[61]

Each of the four MVIWAMO local networks has a lobby and advocacy sub-committee to organize the common lobby issues based on the members' concerns and to act upon them. In Mtowambu, for example, during their lobby meetings with government leaders the local farmers' group network (MVIWABU) advocated the need to urgently end existing conflicts between farmers and pastoralists in the area. MVIWAMO participates in the NGO network (MoN-net) meetings and in the DAC. MVIWAMO uses these fora to advocate, for example, the need for complementarity in AR&D activities supported by the various actors in Monduli.

Improving agricultural productivity through innovation

A detailed inventory has been made of recent innovations that have been adopted and implemented by farmers, as well as the farmers' feedback on agricultural innovation initiatives by various stakeholders. The results of these studies show that farmer innovation depends on the following:

- The organization of agricultural extension services: MVIWAMO does not itself provide extension but offers such services to members in collaboration with the District Council Departments and other organizations. MVIWAMO informs the District Council's executive director of specific requests for professional assistance, financed by MVIWAMO on the basis of variable cost recovery. MVIWAMO works very closely with the district's crop and livestock extension team, as well as with community development (group formation and dynamics) and health (HIV/AIDS) agents.
- Input supply facilitation and support: MVIWAMO facilitates the formation of SACCOs as well as the establishment of supply centres for agricultural and

[61] Monitoring is being implemented through a learning approach, which includes five questions: Which local network is actively involved in agricultural innovation? What have they done? What have they done well? What have they not done well? What are the reasons for doing well or not doing well?

livestock inputs. Local network members have attended training on SACCOs and study tours to successful groups in Morogoro, Dodoma and Kilimanjaro. Groups can make use of MVIWAMO's revolving fund for these activities, which was started through externally provided seed money. All four networks are expected to establish local SACCOs.

- Promotion of marketable crops and alternative livestock raising: MVIWAMO encourages farmers to diversify enterprises for increased income and to grow locally adapted and alternative marketable crops. Although MVIWAMO facilitated the innovation process, many other stakeholders were also involved.

Strengthening the learning ability of farmers' groups

Farmers are encouraged to communicate at group level. Some FGs in the Komolonik local network conducted peer monitoring and study visits in which farmers learned about successes from their fellow farmers in the field. Several on-farm demonstrations were carried out during these visits to allow the exchange of information and experience, and to provide feedback on training or study visits carried out previously by one or more of the local network members.

Organizing complementary services to farmers

MVIWAMO does not employ a service provision team, but links farmers with individuals and organizations/institutions able to provide the required services to a particular group through a network. In Monduli this has operated well over the past three years, although a few other organizations believe in greater competition in service provision. MVIWAMO works through simple terms of reference and collaboration agreements, or sometimes just through a negotiated contract. In the future MVIWAMO intends to embark on a more formal approach through Memoranda of Understanding and legally binding contracts.

9.5 Results of MVIWAMO's role in agricultural innovation

MVIWAMO is a young organization that is ambitious to learn more about providing services to its members. Since its formation in 2001, MVIWAMO has paved the way for many FGs to flourish and gain strength and confidence. Farmers in Monduli district are now in a position to express their opinions and be heard by the rest of the community. MVIWAMO has been successful in advocating the importance of FGs strengthening their collective voice. As a consequence, the status of MVIWAMO members has risen considerably: members have improved their skills in agricultural and livestock production, FG leaders are invited to village meetings, and people are less afraid to express their views.

Due to the gains observed by MVIWAMO members in productivity and incomes, the number of FGs has increased (from 12 in 2001 to 75 in 2004) and is

expected to rise even further. As an organization MVIWAMO has gained recognition as a key stakeholder in Monduli district and has been invited to join partnerships with many other organizations and institutions.

MVIWAMO's philosophy, to prepare FGs to be easily accessible by all other stakeholders (government, NGOs, private sector), has proven to be both functional and effective. MVIWAMO's establishment has reduced efforts and costs (by other organizations) in forming new groups. MVIWAMO has succeeded in working effectively with professionals employed by the Monduli District Council for implementing various activities in the field (e.g. in agricultural and livestock extension and community development).

9.6 Main constraints and challenges for MVIWAMO

MVIWAMO works with members through their FGs, particularly with respect to information sharing and training concerning agricultural innovations. It does this in collaboration with other stakeholders, mainly from NGOs and the private sector, but also in coordination with the public sector. Most activities are based on the requirements of its members, constituting a demand-driven service supply approach. Working with FGs as an entry point to service provision has proven successful. Both the forward and backward links effectively reduce workloads, enhance complementarities in development and help ensure a rapid dissemination of agricultural innovations. However, service providers need to be open to collaborating with each other, to reduce competitiveness and capitalize on comparative advantages.

Creating working fora, communications platforms and strategic partnerships can enhance communication between development actors, and thus enhance agricultural innovation in rural areas. As a learning organization, MVIWAMO strives to improve its service provision, building on the capacities of all other organizations in the district. MVIWAMO needs to further strengthen the links and interactions between the formal district network and the organization's local networks before embarking on any expansion outside Monduli. The outreach and expansion strategy (within the Arusha and Manyara regions) will require assistance from MVIWATA and other organizations.

10 Research findings

10.1 Policy environment and institutional context

All case studies presented in this overview concern Sub-Saharan African countries that have embarked on reforms of agricultural research and extension systems (this is exemplified by the Benin and Tanzania cases but there are many other countries where similar developments are underway[62]). The reforms aim to enhance demand-driven services through greater stakeholder participation in decentralized systems for priority setting and resource allocation. Also, the overall process of democratization, economic liberalization and privatization sweeping across Africa see private enterprises and NGOs offering knowledge-for-innovation services to farmers and FOs (for example: in the Benin cotton and cashew sector, the Irish potato production and marketing chain in Rwanda, and coffee and tea production and processing in Tanzania). Although this may represent a new distribution of roles between actors, in some cases there is still some reminiscence of the 'transfer of technology' approach (as in Benin and Rwanda).

These new institutional arrangements continue to evolve through the emergence of the private sector (Benin cases), the continuing lack of resources for public-sector agricultural services (Benin and Rwanda cases); a more prominent position (voice and role) claimed by FOs (Rwanda and Tanzania cases); and by the start of the knowledge economy and information era, which leads to multiple sources of knowledge-for-innovation. In all cases new links between FOs and public/private sector service providers (including NGOs) are emerging through public-sector initiated multi-stakeholder fora and privatized agricultural services. However, few of these links are formalized by FOs and sustained through appropriate funding mechanisms. Consequently, planning and monitoring processes do not always go beyond merely consulting farmers and FO representatives.

Farmers' institutions and organizations provide important social capital to create momentum for enhanced adoption of technological innovations and the transformation of the agricultural sector by accessing knowledge sources,

[62] Uganda is currently involved in a major reorganization of its NARS to make it more stakeholder-controlled and pluralistic through the National Agricultural Advisory and Development Services (NAADS; see for example Friis-Hansen et al., 2004).

inputs and markets, (as demonstrated in Tanzania and Rwanda[63]). FOs not only have advantages in terms of economy of scale for providing support services but they also represent indigenous knowledge and experience, as well as interactive learning with the private sector. They are also (or should be) at the centre of agricultural sector policy formulation and implementation.

10.2 Types of farmers' organizations

The case study results show that the way in which the various FOs seized the newly created opportunities for accessing knowledge-for-innovation were largely determined by their own special history and origin. The FOs (notably the farmers' and producers' groups and unions that are members of larger federations and networks that were included in the case studies) provide a basis for a typology according to the nature of the investments made (Bingen and Rouse, 2002; Bingen et al., 2003) and the types of links that are being sought. Table 10.1 shows the main characteristics of FO types:

i 'old' commodity-based FOs with contractual relations;
ii 'new' market-oriented FOs with collaborative relations; and
iii service-system and network-oriented FOs.

However, in practice FOs (especially networks and federative structures) often include features of each of the three major types.

'Old' commodity-based FOs with established contractual relationships

In Benin, the FUPRO and its affiliated provincial/district unions and village POs clearly exemplify this type. The village POs were created with investments from cotton parastatals (with a monopolistic position) and support from public sector services on a 'contractual' basis to organize input supply and provide cotton for marketing and export in return for pre-funding of inputs.[64] Strengthening these FOs, whether via agricultural extension service or union staff, still focuses on managing the logistics for input supply and marketing of cotton. Innovation within the cotton sector is mainly technological and generally driven by the private sector (input supply, cotton processing and marketing) with strong links to the international commodity market, which remains the 'trigger' for innovation. Accessing input and marketing opportunities offered by the FO motivates membership. Cotton levies for development activities in the cotton chain and payment of service provision by FOs are centrally collected and distributed among FUPRO member organizations. This is considered to be a weak basis for committed membership; direct membership fees are insignificant and hardly play a role in farmers' decisions to join.

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[63] In Rwanda, agricultural research and extension are undergoing the same reforms as part of the government's efforts towards economic reconstruction and social cohesion in the post-conflict period.

[64] Inputs for cotton production are now directly supplied to the farmers by the private sector (previously by the parastatal) on a credit basis and are discounted when cotton is marketed. The private sector now invests in the commodity chain.

Table 10.1: Types of FOs and their main characteristics

Criteria	'Old' commodity-based with contractual relations	'New' market-oriented with collaborative relations	Service-system and network-oriented
Membership motivation	Contracts for buying inputs and selling produce	Access to markets and services	Access to services and collective action
Governance and management	Influenced by commodity-sector policy	Influenced by project strategy	Related to community practices
Human resources	Paid staff and elected officials	Elected officials (and paid staff)	Elected officials, volunteers (and paid staff in federations)
Financial resources	Commodity levies and 'paid for' contractual services	Produce levies and donor funding	Membership fees and donor funding
Internal relations	National (hierarchically structured) unions	District unions	National federations (of networks)
External relations	Focus on existing contractual relations with private sector	Focus on developing collaborative relations with project support	Focus on partnership relations through joint action
Innovation focus	Technological	Technological and institutional	Technological, institutional and organizational
Innovation drivers and triggers	Private (and public) sector Markets	Public (and private) sector Markets	Public sector and individual members Markets and members' needs
Case study FOs	FUPRO/UCP-Benin	ACooBéPA-Benin IMBARAGA affiliated FOs – Rwanda	IMBARAGA affiliated FOs – Rwanda MVIWATA/MVIWAMO affiliated FOs-Tanzania

Modified from Bingen and Rouse, 2002.

Although not included in the case studies, outgrowers' associations that have been established with private sector support and have contractual relations with private enterprises are also an example of this first type of FO. Contractual relationships between individual (large and smallholder) farmers and the private enterprise are particularly strong and the organization of farmers is entirely focused on improving the handling of logistics for input supply and delivering quality products.

'New' market-oriented FOs with emerging collaborative relationships

The IMBARAGA affiliated potato producers' federations in Rwanda and the ACooBéPA member unions in Benin are considered to be examples of this FO

type. Both spearhead activities to develop production and marketing chains through externally funded projects that are managed by NGOs. The FOs are often community-based, while their future viability largely depends on the project design and the approach adopted by the NGOs.[65] In Rwanda, the supporting NGO consortium (ROPARWA) therefore focuses on both organizational strengthening and management assistance to the FOs, with the aim of innovating collaboration with both public and private actors within the chain, and making technological innovation more demand-driven.[66] In Benin, both the project and facilitating NGO (DEDRAS) still focus on supply-driven, technological innovation for developing the cashew production and marketing chain.[67] FO membership is also motivated by access to input supply and markets, but direct membership fees and local-level managed levies for the functioning of the FO clearly reinforce the relationship between the FO and its members, and between various organizational entities.

Service-system and network-oriented FOs

The MVIWATA national and MVIWAMO local networks and farmers' groups are examples of this FO type, although this model also includes features of the second type, just as IMBARAGA includes features of this third type. Promoting self-help groups with an emphasis on networking at the local level (relatively small farmer groups) and learning-by-doing can make a significant contribution to social capital. Farmers arrange themselves into organizations, or fora, and establish partnerships with other actors to provide various services to their members (infrastructure development, SACCOs for credit and savings schemes, FFS for information and demonstrations on technologies, etc.). Innovation is therefore both institutional and organizational, with a focus on grass-roots farmer institutions. Technological innovation is very much farmer-driven and triggered by farmers' needs. Membership of these FOs is again motivated by the services provided but is strongly reinforced through financial contributions and in-kind cost-sharing for farmer group-led projects.

These FOs roughly correspond to the types mentioned in chapter 2.3: the old, top-down, state-initiated cooperative structures and the more bottom-up, private-sector (private enterprises and NGOs) initiated organizations in response to APVC opportunities and community-driven development initiatives. The younger (national) farmer federations are often a combination of the second and third FO types.

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65 An NGO can become an obstacle to sustainable FO development if this conflicts with the NGO's interests as a donor-funded provider for the management of the project (Bingen et al., 2003).

66 The Tanzania Association of Kilimanjaro Specialty Coffee Growers (AKSCG) is another example on how the innovative organization of farmers and links with the market contributes to technological innovation in the coffee chain.

67 The other agricultural diversification projects mentioned in the case study are other typical examples of this approach, in which FOs are 'instrumental'.

10.3 Links for accessing knowledge and information

The case studies underscore the fact that sources of knowledge and information for farmers have greatly diversified over the last decade and that consequently FOs are starting to take advantage of these various opportunities.

The 'old' commodity-based FOs represent an important market for input supply (such as the FUPRO and affiliated district unions in Benin), which is one of the reasons why they now also receive technology information from the private sector (e.g. on cotton pesticides from input producing and distribution companies). Cotton producers contribute to agricultural research (CRA-CF) and extension (CeRPAs) via levy funds, but the opportunity that this represents to FO member-orientation of these services is only partially exploited. Financial issues, with clients' priorities receiving insufficient attention, dominate decision-making at the central level (in the AIC, of which FUPRO is a member).

Other FOs obtain knowledge and information through NGOs that facilitate relationships with public sector agricultural research (such as between DEDRAS and ACooBéPA in Benin e.g. for the supply of cashew seedlings), but without any actual participation by the cashew farmers. Both IMBARAGA in Rwanda and MVIWATA (including MVIWAMO) in Tanzania address farmers' livelihoods, i.e. by developing entrepreneurial skills as well as the social and human capital assets of farming households. Both FOs strive to establish working relationships with formal agricultural research by enhancing real farmer participation in research efforts and establishing farmer-to-farmer extension networks.

In all cases, providing 'private goods' and related technical advice (such as for agricultural inputs and instructions for their use) is increasingly becoming private-sector business. For example, import firms provide cotton fertilizers and pesticides, local private nurseries produce and sell cashew plants, and farmer-led cooperatives produce potato seeds. The more network-type FOs use a wide array of providers, especially NGOs, through their strong linking capacities. In all cases FOs have yet to define their exact roles in relation to private service providers and, in particular, in market-driven APVCs.

As a consequence, FOs are only involved in public-sector-led innovation to a limited extent. Farmers compare different sources of knowledge and information and use those most appropriate to them. The multi-stakeholder setting for agricultural innovation in the countries concerned has resulted in diminished farmer interest in influencing public-sector providers directly; public-sector-led innovation is no longer automatically the farmers' first concern. However, public-sector organizations continue to play an important role in facilitating innovation through their links with the international scientific community (as demonstrated in export-oriented APVCs, such as cotton and cashew) and in ensuring adequate human resource development for the AIS. However, in all the countries studied, the public sector needs to redefine its role in relation to the emerging private sector, especially in a

context where national and local governments are heavily committed to food security and poverty-reduction strategies.

The FOs reviewed in the case studies (with the exception of the FUPRO) do not have many formal partnership agreements (Memoranda of Understanding, contracts, etc.) with knowledge and information providers. They have no strong institutionalized role in the priority setting and management of these service providers at the decentralized levels where decisions are made. However, export commodity-based POs (such as FUPRO) and other national FOs (federations, syndicates, etc. such as MVIWATA in Tanzania), are increasingly represented on boards, steering committees etc. It is rare that token farmer representatives actually represent the farmers' wide and diverse range of interests; the poorest smallholders, female farmers, HIV/AIDS affected households or other social minority groups are even less heard. The case study results indicate that procedures for both planning and accountability (M&E of results) for agricultural services to members are very poorly developed in FOs and are often only reinforced at the initiative of external organizations.

10.4 Roles of farmers' organizations in agricultural innovation

All FOs studied contribute to the so-called 'support functions'[68] of the AIS, notably the facilitation of input supply and marketing of agricultural products but also by organizing credit and savings schemes. This situation again demonstrates the vital importance of these support functions for farmers in facilitating technology adoption and the 'trigger' role that market access plays in innovation processes.

The 'basic AIS functions'[69] are still seen by some FOs as the exclusive responsibility of the public sector and the NGOs. However, network-oriented FOs (such as IMBARAGA-affiliated FOs in Rwanda, plus MVIWATA and MVIWAMO in Tanzania) substantially participate in research and extension at the grass-roots level, but lack the power and resources to set agendas at the more strategic and central levels. MVIWATA has even become a knowledge broker between farmers (groups) and the different types of service providers. However, FO-led technological innovations in the Tanzania cases mainly concern general issues of common importance to farming households and are not always addressed within a clearly defined strategy of valuing and marketing products. All three FOs are also involved in institutional and organizational innovation, e.g. linking with markets, and stimulating learning-by-doing by organizing technical committees and farmers' groups, as well as farmer fora at different levels.

[68] AIS support functions: guiding innovation; facilitating exchange and sharing of knowledge; supplying resources and incentives for innovation; and providing complementary services (see chapter 2.5).

[69] Basic AIS functions: identifying needs for knowledge and information; creating knowledge and supplying information for innovation (research and extension; see chapter 2.5).

Ideally, commodity-based FOs (such as FUPRO and its member organizations in Benin) have both the financial and human resources to fund and orient agricultural services according to the needs of their members. But information flows on AR&D issues within the FUPRO network are too weak to improve coordination in setting the overall research and extension agendas, preferably in cooperation with other FOs. Both the private sector (e.g. input suppliers and cotton ginners) and the public sector (the cotton research institute and extension) are the main drivers behind technological innovation at the production level.[70] Innovations therefore mainly concern improved varieties, fertilizers and pesticides and technologies are generated as standard packages without much adaptation and differentiation according to the diversity of farmers' needs and circumstances. The ACooBéPA case of the cashew planters in Benin provides a similar picture: innovation is almost entirely funded and driven by donors and an NGO organizes and manages the entire process.

10.5 Best practices and lessons learned

Table 10.2 presents an overview of the most salient best practices and lessons learned (in terms of challenges) from the case studies with respect to:

i policy-making and implementation;
ii exchanging and sharing knowledge and information;
iii guiding the innovation process; and
iv providing complementary and supporting services.

Policy-making and implementation

The importance of proactive farmer involvement in innovation development is now increasingly recognized, hence the strong emphasis on farmer empowerment for networking (social capital) in many development projects. However, FO contributions to innovation vary and depend on their stated and actual mission, assets and networks, as well as their historical background. Local-level FOs are often not formally registered or recorded in general registers. There is a need for a district-based overview showing where these local FOs are located and what they do to facilitate agricultural innovation.

Another FO contribution is to represent individual farmers and farmers' groups at higher levels in order to lobby for their interests and provide evidence to make the case for favourable policies. FOs can be successful in influencing policies, based on their own experiences (learning by doing).

Training group/network leaders and farmer promoters (e.g. in leadership and communication) has had a positive impact, as farmers feel more confident, are able to speak out in meetings and have the capacity to clearly identify innovation constraints and opportunities. Unfortunately, most of these positive experiences

[70] In Tanzania, cotton ginning innovation took place when saw gins were introduced by the private sector to replace the older roller gins, with major consequences for the entire cotton chain.

Table 10.2: Best practices and lessons learned from the case studies

AIS functions	Best practices	Lessons learned
Policy-making and implementation	FOs contribute to policy-making by providing FO experiences (evidence-based)[d]	Reinforce the FOs' capacity for evidence-based policy-making (learning-by-doing)
	Empowering FOs with grass-roots links (social capital) for agricultural innovation and transformation[cd]	Prepare an (district) overview of FOs/FGs, their characteristics and functions to identify their (potential) roles
	Training local FO leaders to voice their demands[d]	Document FO experiences of voicing demands for innovation
Exchange and share knowledge, identify knowledge needs and supply information	Local learning initiatives (FRGs, FEGs, FFS, etc.) for sharing and exchanging experience and information[ad]	Establish partnerships with the public and private (market-oriented) sector to advance and guide experiential learning[71]
	Use printed material (newsletters) and media (radio programmes) for sharing information[acd]	Document FO-initiated best practices to gain credibility with technical and financial partners
	Joint activity programmes between FOs and public-sector agricultural extension for providing front-line services[bcd]	Design sustainable funding mechanisms and coordinate services provided by the public sector and private enterprises
Guide innovation processes, identify knowledge needs and supply information	Synergy between APVC-oriented and community-based information and training approaches[c]	Establish interactions between commodity-based and general issue FOs for putting cross-cutting issues on the AR&D agenda
	FO initiated (provincial) technical committees (themes, crops or products) to orient innovation activities[bc]	Link with formal multi-stakeholder platforms that have a decision-making mandate on AR&D programmes
Provide complementary and supporting services	Linking development investments with FO managed contracts for client control over services[d]	Design service provision and delivery systems at local governance entity level

Case studies referred to: a) FUPRO – Benin; b) District producers' unions – Benin; c) ROPARWA/IMBARAGA affiliated POs – Rwanda; and d) MVIWATA/MVIWAMO network FGs – Tanzania.

have not been properly documented; such evidence is important in order to avoid a loss of FO credibility with other partners and funding organizations.

Exchanging/sharing knowledge and information

The exchange of knowledge is generally well organized at the field level, either through learning initiatives developed by formal research institutions or by the FOs themselves. However, the number of knowledge exchanges or interactive

[71] For example through 'Farmer Business Schools' for agribusiness development.

learning opportunities is limited and a greater effort is required to advance experiential knowledge generation and dissemination in which grass-roots institutions establish partnerships with NGOs, public-sector institutions, and the private sector. Close links with the (market-oriented) private sector also help to give direction to the innovation process and facilitate the required co-innovation in APVCs.

Initiatives taken by most of the FOs, such as participating in agricultural shows, producing newsletters, organizing radio programmes, etc., are important means of sharing knowledge and information between farmers and other stakeholders. However, FOs need to include others in these initiatives, not just NGOs and public-sector organizations, and develop mechanisms to better document the farmers' experience and indigenous knowledge.[72]

In many cases, FOs and agricultural extension agents are involved in joint information dissemination and training programmes. Such experience presents promising opportunities for tackling the shortage of front-line extension agents through closed pocket arrangements, cost-sharing, and/or externally funded training of farmer extensionists by extension agents. The case studies indicate that working with cost-sharing arrangements for services significantly enhances farmer ownership. Private enterprises also increasingly provide services, which need to be clearly coordinated with those provided by the public sector and/or the FOs. Ensuring the financial sustainability and continuing responsiveness of these services to members' needs are other important challenges.

The financial capacity of most local governments to support general extension services is limited, which is why it is necessary to establish a pluralistic extension system. However, grass-roots farmer institutions also need to contribute from their own resources if these new initiatives are to be sustained. Mobilizing savings and establishing grass-roots micro-finance institutions are critical to the sustainability of these initiatives, as are a market focus and the careful selection of high value and marketable produce.

Guiding the innovation process

APVC-oriented and community-based extension systems combine two core strengths: community-based approaches are readily adaptable and socially embedded for organizing dissemination of information, while APVC-oriented approaches closely link producers and markets for defining the type of information needed. The APVC approach also generates financial resources for providing these services. Commodity-based POs have the necessary resources to develop relationships focused on a more client/user service provider basis, with transparent planning and accountability mechanisms. Closer interaction between general-issue FOs and those that are commodity-based is urgently required in order to address cross-cutting issues that concern large farmers and smallholders alike.

[72] See for example Reij and Waters-Bayer (2001) and www.prolinnova.net.

Farmers' group and farmer fora development is part and parcel of the reconfigured AIS, with client representation in decision-making bodies. The challenge is to insert existing grass-roots networks into larger networks in such a way that they contribute to sustainable social capital development. Higher-level initiatives such as thematic groups, technical committees, etc. organized by FOs themselves are also required. They can link with district and provincial fora that decide on priorities and resource allocation for agricultural services (e.g. multi-stakeholder fora organized by agricultural research centres).

Providing complementary and supporting services

Farmers' groups (e.g. FRGs and FFSs) exist to improve their members' access to technology, but also to access funding and markets and/or to support members in the event of unexpected needs (traditional and culture-based groups). A number of development initiatives (e.g. the testing of Ward Facilitation Teams and District Farmer Fora in Tanzania and Uganda) have demonstrated how to link investments with group-based management using contracts and other funding-control mechanisms that give the clients greater control over planning, implementation and M&E of services. The collective experience from the case studies reviewed indicates the appropriateness of locating demand-driven service provision at local government level or deconcentrated service provision.

11 Conclusions

11.1 Strengthening the role of farmers' organizations in agricultural innovation

Case study results indicate that strategies for strengthening the role of FOs in AIS need to take account of the (adapted from Berdegué et al., 2002):
- policy environment and institutional context;
- assets (and needs) of the FO membership base; and
- type of FO involved.

The farming households' assets depend on the degree of market integration and they consequently both determine the capacities, the activity portfolio and the resources of the FOs to which these farming households belong.

This can be clarified by distinguishing three situations (adapted from Berdegué et al., 2002):
- The farming households are strongly integrated into markets and consequently build up assets. The market acts as the trigger for innovation, farmers invest in professionalizing agriculture and there are potential spin-offs with regard to off-farm activities. The private sector plays an important role in agricultural services, while the public sector increasingly concentrates on regulatory and coordinating functions. The innovation process basically has a technological character and is centrally and/or externally steered without appropriate mechanisms to make it more farmer-driven. This is the situation in which (export-oriented) commodity-based FOs evolve; they have established contractual relationships for input supply and produce marketing and a solid resource base that offers possibilities to enhance the demand-driven levels of other knowledge-for-innovation services provided to members.
- The conditions are favourable for developing markets but farming households have limited assets. Market access can be developed such that it becomes a trigger for innovation and allows farming households to build up assets. Public-sector organizations (and NGOs) increasingly focus on linking farmers with private enterprises and creating public-private partnerships (PPPs) for innovation within well-targeted APVCs. The emphasis on establishing such links gives innovation a greater institutional challenge. The 'new' market-oriented FOs without strong ties to the private sector, but also service-system-oriented FOs, may operate in this kind of environment; often with external support (from donors, NGOs or private-sector assistance), which emphasizes technological innovation. Conflicts of interests between donors, NGOs and

FOs in donor-funded and NGO-managed agricultural diversification or chain-development projects may hamper sustainable institutional development and organizational strengthening of these FOs.
- Conditions for market development are currently unfavourable and farming households have few assets. Market access can be developed but only on a limited scale. Public sector (and NGO) efforts therefore adopt a livelihood perspective and promote basic preconditions for agricultural development such as infrastructure development, local resource mobilization, participatory technology development, etc. Local service-system-oriented FOs often merge in this kind of situation; their solid social capital is their main asset for partnering with local government authorities and service providers. They strive to develop social capital through both institutional and organizational innovation, but face the challenge of building up and/or merging into higher-level networks.

11.2 Challenges to empowering farmers and farmers' organizations

Empowering farmers and their organizations is the guiding principle behind strengthening the role of FOs in AIS, and contains a favourable policy context and institutional setting, improvement of access to information and capacity reinforcement for local organization with a special attention for issues such as social inclusion, participation and accountability.

Agricultural innovation is an interactive, multi-stakeholder process that requires a favourable policy context and appropriate institutional setting that allows actors to interact and create a substantial consensus on the strategic orientations for innovation. FOs cannot achieve this alone and need to build alliances with the other actors. Furthermore, other actors also face challenges such as:
- establishing formal partnerships with FOs (see also Collion and Rondot, 1998)[73];
- further decentralization of multi-stakeholder platforms (within the NARS/AKIS/AIS) and opening of these platforms to the private sector;
- designing appropriate funding mechanisms that strengthen demand-driven procedures for planning of and resource allocation for AR&D activities.

Based on the results of the aforementioned cases studies, the following empowerment challenges have been noted:
i linking with key (public and private sector) service providers;
ii planning and M&E of knowledge-for-innovation services;
iii orienting and facilitating innovation processes;
iv developing an (interactive) learning environment and learning capacities;
v enhancing participation, social inclusiveness and accountability; and
vi enlarging the power and resource bases of FOs.

[73] This paper by Collion and Rondot (1998) presents an overview of the results of a case-study-based research programme and issues concerning the relationships between FOs and (mainly public sector) AR&D organizations. See also Boyd et al., 1999b.

Linking with key service providers

Linking with key actors for innovation is not limited to those that provide straightforward knowledge-for-innovation and technology services; importantly it also extends to parties that contribute to the so-called support services of AISs, such as credit and savings schemes, infrastructure development, and input supply and marketing channels. From the farmers' point of view, these services are of vital importance to successful innovation, and AR&D issues therefore need to be contextualized and accepted as such by other actors and stakeholders.

FOs therefore need to:
- identify reliable APVC options through market research;
- identify (private and public sector) actors with which to create a formal link, for exploring markets, and accessing knowledge and information sources;
- identify options for innovation and co-innovation;
- develop both action-research and agro-enterprise skills; and
- identify and link with other 'complementary' services that are necessary for success.[74]

These are particular challenges for both market-oriented and service-system-oriented FOs. The first type requires these capacities to 'release' itself from earlier NGO and/or project supervision, while both types need them to efficiently use their limited resources to formalize these links.

Planning, monitoring and evaluation of knowledge-for-innovation services

The knowledge services provided need to be responsive to farmers' needs if they are to have a positive impact on their livelihoods. This demands an effective participation by farmers and their organizations in planning and M&E of the services provided. FOs themselves can strengthen institutionalized participation by developing the skills of their technical staff to assist FO representatives in preparing planning sessions. Particular skills to be developed include analysis of agricultural innovation constraints within their socioeconomic context and according to the various social groups of the FO's membership, and aggregation of constraints at higher levels of the organization. Numerous tools have been developed for research/extension priority setting and evaluation of research/extension results. A main challenge is to develop mechanisms for farmer-led M&E that allow clients'/users' evaluation and/or beneficiary assessments, and thereby make service providers accountable, more responsive and more efficient.

Experience shows that the underpinning funding mechanisms largely determine the degree of farmer ownership and consequently the responsiveness of the services provided[75]. Possible funding mechanisms include: out-sourcing and in-

[74] See Sanginga et al. (2004) for an example of an integrated approach to demand-driven and market-oriented agricultural research and agro-enterprise development.

[75] See Heemskerk and Wennink (2005) for experiences with various funding mechanisms.

sourcing, cost-recovery, cost-sharing or co-financing, and external funding on a farmer demand-driven basis. The first two mechanisms are indicated options for established commodity-based FOs that have the necessary financial and human resources while sharing costs, but notably (donor-supplied), multi-stakeholder-driven (competitive) funds help 'new' market-oriented and service-system-oriented FOs to strengthen their role in the innovation processes.

Orienting and facilitating innovation processes

Orienting knowledge creation (agricultural research) and information supply (extension) for innovation is crucial. Identifying strategic sectors, crops, products or topics, plus innovation drivers and 'triggers', and consequently the key stakeholders, is all vital to successful planning of and resource allocation for these knowledge services. Participatory planning procedures therefore need to broaden priority setting for technology development and dissemination. The fact that all FOs focus heavily on services other than research and extension (e.g. input supply, savings, credit, etc.) once again emphasizes the importance of factors and issues other than knowledge and technology in achieving effective innovation. FOs need to develop capacity at various levels in relation to innovation development such as:

- evidence-based participatory policy-making;[76]
- formulating comprehensive strategies for technological innovation (within an APVC context);[77] and
- innovative institution building for linking APVC actors[78] and creating interactive learning platforms.[79]

Developing an (interactive) learning environment and learning capacities

Agricultural innovation is an interactive multi-stakeholder process that requires contributions by all players involved. Sharing and exchanging knowledge and information is therefore crucial and requires appropriate fora where stakeholders meet on a regular basis. Other (public-sector research and extension) institutions often initiate these local-level multi-stakeholder platforms (FFSs, farmer fora, etc.). However, FOs need to take the lead in developing platforms at the higher levels in APVCs and eco-regions in order to

[76] For example, MVIWATA experiences with SACCOs that contributed to national policy-making for rural financial institutions in Tanzania.

[77] For example, the UDP Atacora (member union of FUPRO) in Benin created technical committees for specific crops that analyze production and processing constraints via the Strengths-Weaknesses-Opportunities-Threads (SWOT) method. This allows for identification of contextual socioeconomic factors such as credit facilities and market access.

[78] The Rwanda case is an example of generating a proposal for innovative institutional arrangements and targeted AR&D activities that was elaborated at the initiative of a farmer organization (ROPARWA) and an agricultural research institute (ISAR). See also www.icra-edu.org for various methods and tools for agricultural research for development.

[79] For example interprofessional platforms such as the AIC in Benin.

provide indigenous knowledge and to make these platforms more farmer-centred and farmer-accountable. Developing learning capacities is first of all a joint process taken together with other innovation stakeholders, i.e. interactive learning, leading to (and requiring) changed attitudes.

Innovation also includes (farmer) organizational innovation. FOs need to adapt themselves to a changing context (i.e. demands from partners and an increasingly independent membership basis) through collective processes that allow for learning from knowledge and the experience gained by members, staff and similar organizations, in order to continuously improve procedures and practices. Effective operational communication systems and well-maintained and accessible institutional archives (i.e. systematically recording information and experiences) are two important pillars of a learning farmer organization.

Participation, social inclusiveness and accountability

'Old' commodity-based and 'new' market-oriented FOs in particular tend to consider their membership basis to be homogenous; everybody who is involved in producing or processing is considered to have equitable access to services. Knowledge services and technologies provided to members are often standardized, and they seem to be less adapted to the different social groups and types of farming households that comprise their memberships. However, FO members have sufficient information to grasp the socioeconomic diversity of the membership base (e.g. as part of their membership registration and administration) and can define acceptable criteria for all to characterize member groups and specify demands for services.

Weak representation of minority groups (e.g. very poor farmers and women) in decision-making processes due to cultural and institutional barriers remains an important recurrent issue. Internal institutional barriers can be identified and removed (i.e. to go beyond 'window dressing' by appointing women on governing boards), though external facilitation is often needed to achieve this. FOs often cannot achieve effective participation and inclusion alone, so service providers also need to develop inclusive mechanisms and make participation, inclusion and downward accountability a joint responsibility within the service system. However, case study results indicate that strong community-rooted farmers' groups (e.g. farmers' groups, local network groups, etc.) form building blocks for larger organizations and, in combination with training for communication and leadership skills, can enhance opportunities for all social groups to have their voices heard, and thus facilitate upward participation and downward accountability.

Enlarging the power and resource bases

Social, human and financial capital together provide a solid basis for sustainable FOs, which can then fully participate in platforms, fora, etc. on policy-making and implementation. However, many FOs rely on external funds

for organizational functioning and institutional development. Empowerment therefore requires reinforcing both the financial resources (e.g. levies on marketed products, mobilizing resources through grass-roots financial institutions) and the power base (i.e. integrating existing farmer networks and federations). Once the role of FOs strengthens, political interference is also likely to increase, as already sometimes happens at the district level. FOs therefore need to urgently develop their local networks – not only to achieve an even stronger base, but also to further strengthen downward accountability and upward representation.

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