Chapter 8

DEMOCRATIC REPUBLIC OF THE CONGO

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8.1 Introduction

This chapter analyzes the provision of agricultural extension and advisory services in the Democratic Republic of the Congo (DRC) in the context of a postconflict country and the experiences and challenges in reconstituting an extension system. Since 1996, the DRC has experienced a succession of wars and lower-scale conflicts that caused more than 5 million deaths over the 1998–2008 period (Maystadt et al. 2014). These have had a devastating effect on the country's infrastructure, technology, and institutions, creating a vacuum that has led to a laborious process of restoration. As a result, the DRC faces serious food insecurity and human development challenges. In 2011 through 2013 the DRC was ranked as the country with the most severe food insecurity, based on the *Global Hunger Index* of the International Food Policy Research Institute (IFPRI). It remains so according to current alarming hunger indicators (IFPRI 2016). At least 50 percent of the population is deficient in key nutrients, including iron, vitamin B12, calories, riboflavin, vitamin E, folate, and zinc (Ulimwengu, Roberts, and Randriamamonjy 2012). Life expectancy in the DRC is around 47 years for men and 51 years for women; 1 in 5 children die before reaching age 5 (Pfingu 2011; UNDP 2010).

Although the Democratic Republic of the Congo has significant potential to be the food basket of Africa (Tollens 2004; World Bank 2006), it has failed to create an enabling environment for the investments and policy changes that it needs. The key challenge faced by the decisionmakers is how to reform the DRC's extension and advisory services, including other necessary key services and activities to support the efforts of the Ministry of Agriculture, Livestock and Fisheries (MINAGRI) to support the transformation of the agriculture and food sectors (World Bank 2018). This chapter explores the delivery process of extension services to provide a better understanding of strategies and approaches to improve the provision of extension services in the country. It aims to contribute to the transformation of agricultural production and the increase in incomes. Specifically, the chapter aims to do the following:

1. Provide a diagnostic assessment of their structure, capacity, activities, and performance;
2. Characterize and compare the capacities and performance of various extension organizations and agents as well as analyze contributing factors;
3. Synthesize the evidence and lessons of various effectiveness analysis and impact evaluation studies of extension approaches; and
4. Identify feasible entry points to strengthen and reform the national extension system.

The guiding principle in this chapter is the "best-fit" (conceptual) framework that is described in Chapter 1 of this book (Birner et al. 2009). Section 8.2 discusses the methods and data sources for this chapter, while Sections 8.3 and 8.4 include the main findings summarized based on the various components of the best-fit framework (items 1 and 2 above). Section 8.5 summarizes the analysis of the performance of extension organizations and agents. Section 8.6 summarizes the evidence and lessons on effectiveness and impact of extension programs and approaches (item 3 above). Last, Section 8.7 provides some concluding remarks and policy implications.

8.2 Data Sources and Methods

This chapter synthesizes a series of literature on agricultural policy processes and extension services in the Democratic Republic of the Congo as well as various data collection approaches and analytical methods. Table 8.1 presents the diversity of methods used. First, an extensive literature review of the status of extension services was conducted. Second, a mapping was carried out of the institutional process network as well as interviews with key informants to better understand the role of agriculture sector players in general, with an emphasis on extension services (Ragasa, Babu, and Ulimwengu 2014). Third, surveys were carried out in August to October 2011 on extension organizations, extension workers, rural producer organizations, and Agricultural and Rural Management Council (Conseil Agricole et Rural de Gestion, CARG) management teams. These included three key provinces: Bandundu, Bas-Congo, and Kinshasa (Table 8.1) (Ragasa, Babu, and Ulimwengu 2014; Ragasa, Badibanga, and Ulimwengu 2016; and Ragasa, Ulimwengu et al. 2016).

The selection of these three western provinces is mainly based on the focus of the government at that time in piloting an effort to strengthen and

reengage with the CARGs in relation to its National Agricultural Investment Plan (NAIP). Given the continuing turmoil in the eastern region of the DRC, the research team was unable to carry out its field work there. Since much of the literature focuses on the eastern part of the country, primary data collection for the western area was combined with the literature reviews relating to the eastern part, in order to draw an overall representation of DRC's extension system.

Sample territories and villages were randomly selected in the three western provinces, consistent with the National Statistics Institute's national 1-2-3 household survey, where each number refers to a separate phase: (1) employment, (2) informal sector, and (3) consumption.[1] In Table 8.1 we indicate the method that was applied to ensure that the selection of respondents was not biased. The various datasets were analyzed using various qualitative and quantitative approaches. An institutional analysis and process-network mapping were conducted (Ragasa, Babu, and Ulimwengu 2014). In addition, comparative and econometric analyses were employed to analyze the factors affecting the performance of CARGs, extension organizations, extension agents, and rural producer organizations (Ragasa, Badibanga, and Ulimwengu 2016; Ragasa, Ulimwengu et al. 2016). These provide rich datasets informing and assessing performance of meso-level organizations, which are providing and facilitating extension and other services to the rural communities. Last, we collected household-level data in the three provinces in line with the midline of the USAID's Food Production, Processing and Marketing Project (Ragasa, Nkonya et al. 2016).

8.3 Governance Structures and Policies

Institutional Landscape

The institutional landscape of the agriculture sector is presented in Figure 8.1. This is based on interviews with 45 high-level officials and representatives of the MINAGRI, the Ministry of Rural Development (MINRD), CARGs, parliament, nongovernmental organizations (NGOs), the private sector, and

(text continues on page 270)

1 Territories are lower administrative units than province and are composed of several *secteurs* (sectors). In terms of size, the following depicts the administrative units in the Democratic Republic of the Congo: "province" is larger than "territory," which is larger than "sector," which is larger than "groupment," which is larger than "village."

TABLE 8.1 Methods used to collect data for this study

Method and purpose	Date	Respondents	Selection of respondents	Analytical methods
Exploratory visit and key informants' interviews to understand policy and institutional context; including focused institutional-process-network-mapping exercises	May 2010	45 key informants (interviews were mainly conducted in Kinshasa, but experts are from various provinces)	Purposive, snowball approach	Descriptive analysis
Literature review	Mainly from May 2010 to May 2012; updates done in November 2015; April 2017; and May 2019 corresponding to the times this chapter was revised	National	Illustrative rather than exhaustive	Descriptive analysis
Review of meeting minutes and reports to look for the diversity and depth of topics discussed and problems raised, indications of follow-up or outcome of the previous discussions, indications of participation/attendance	February–March 2011	30 meeting minutes from 10 different CARGs were collected (national)		Descriptive analysis
Survey of CARGs to understand functioning and assess performance	April–October 2011	Three provinces: 55 CARGs in 23 randomly selected territories*	(1) Randomly selected 23 territories, consistent with the National Statistics Institute implementation of the national 1-2-3 household survey; (2) interviewed all CARGs in the target territories; (3) acquired full listing of the CARG leaders and members (stratified by government and nongovernment); (4) randomly selected 3 from leadership; 1 member from government strata, 2 members from nongovernment strata; (5) conducted face-to-face group interviews lasting between two and three hours	Descriptive analysis and econometric analysis to identify factors explaining CARG performance

Method and purpose	Date	Respondents	Selection of respondents	Analytical methods
Survey of rural producer organizations (RPOs)	April–October 2011	Three provinces: 181 community organizations in 23 randomly selected territories	(1) Randomly selected 23 territories; (2) interviewed all RPOs (with some agriculture related activities) in the target territories; (3) interviewed a group of four to six opinion leaders from these RPOs; (4) conducted face-to-face group interviews lasting between two and three hours	Descriptive analysis and econometric analysis to identify factors explaining RPO performance
Survey of agricultural extension organizations (AEO)	April–October 2011	Three provinces; 107 extension organization heads in 23 randomly selected territories	(1) Randomly selected 23 territories; (2) interviewed all AEO in the target territories; (3) interviewed the head or representative from these AEO; (4) conducted face-to-face individual interviews lasting between two and three hours	Descriptive analysis
Survey of agricultural workers	April–October 2011	Three provinces: 162 randomly selected agricultural workers in 23 randomly selected territories	(1) Randomly selected 23 territories; (2) interviewed all AEO in the target territories; (3) acquired list of workers in each AEO and randomly selected four to eight workers; (4) conducted face-to-face interviews lasting between two and three hours	Descriptive analysis and econometric analysis to identify factors explaining extension agents' performance
Household survey	February–August 2014	Three provinces: household survey and midline assessment of an agricultural program (FPPM)	Total of 3,110 households in randomly selected treatment communities and randomly selected comparable/control communities	Descriptive analysis and difference-in-difference method to assess indicative impact of the interventions

Source: Authors.

Note: * Three provinces include Bas-Congo, former Bandundu, and Kinshasa. FPPM = food production, processing and marketing project. CARG = Agricultural and Rural Management Council.

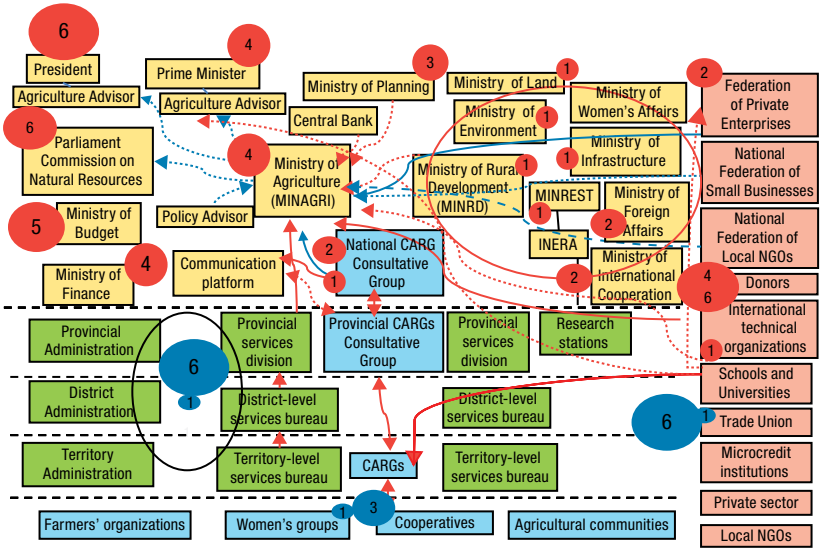
universities, guided by a Net-Map approach and a semistructured questionnaire.[2] MINAGRI and MINRD were the two key ministries responsible for leading the agricultural strategy and policymaking process in the Democratic Republic of the Congo. The political system—including the president, prime minister, and parliament at the national level and elected government administrators at the local level—determines the financial resources and creates the enabling environment for the agricultural sector. Various government ministries (each in its own jurisdiction) are responsible for policymaking and planning, implementation, and monitoring of development programs. The DRC has 26 provinces (including Kinshasa), 30 districts, 145 territories, and 800 sectors (formerly called *collectivities*); within the decentralization process, the provincial services of the ministries are being revitalized to provide service provision to the rural population.[3] Staff recruitment to support the decentralized units is ongoing.

Farming communities and their organizations are critical players in the agricultural sector. The three federations of NGOs—the Federation of Laic and Economic NGOs (FOLECO), the National Council of Development NGOs (CNONGD), and the Regional Council of Development NGOs—so far have not gained much influence in the agricultural policymaking process. For a more systematic engagement of civil society organizations into the policymaking and planning process, the government initiated in 2008 the creation of CARGs, which are the platforms for multistakeholder discussions, policy dialogues, and information sharing. Private-sector participation in the agricultural policymaking process in DRC has not been strong in the past years, except for some advocacy efforts by the Federation of Private Enterprises in Congo (FEC). This national federation of private companies has to date only a few agriculture-based, large-scale companies as members. Similarly, the Confederation of Small and Medium Enterprises of the Congo (COPEMECO), of which numerous small-scale enterprises are members, has not gained a strong presence in the agricultural policymaking process. Despite the presence of these CARGs and confederations, weak linkages and

2 MINRD was first created in the 1980s, but it was absorbed twice into MINAGRI and then recreated as an independent ministry. CARGs are platforms for consultation, dialogues, problem-solving, articulation of demand of rural services, and monitoring of programs at the territory and local levels and an avenue for engagement in policymaking processes at the provincial and national levels (Ragasa, Badibanga, and Ulimwengu 2016 for details).

3 Based on Decree Law 081 (July 2, 1998) on the territorial and administrative organization of the DRC. This figure includes three districts in Kinshasa (excluding a chief of district). Most of the districts are to become provinces (except the newly created district of Plateaux), according to Article 2 of the Congolese Third Republic Constitution (www.presidentrdc.cd/constitution.html).

FIGURE 8.1 Organizational structure of the agriculture policymaking process in the Democratic Republic of the Congo



Source: Adopted from Ragasa, Babu, and Ulimwengu (2014), based on Net-Map interviews with a high-level official of the Ministry of Agriculture, CARG representatives, and a staff member of an international organization who has worked in the DRC for several years. These Net-Maps were complemented by interviews with several key actors in the agriculture sector.

Note: CARG = Agricultural and Rural Management Council; INERA = National Agronomic Research Institute; MINREST = Ministry of Research, Science, and Technology. The structure and placement of the actors do not represent political ranking or authority. The purpose is to inventory the various actors involved in the agricultural policy process at the national and local levels; to illustrate links among the various actors; and to identify who has influence in the actual agricultural policies being designed, funded, and implemented. The numbers in circles represent the influence level (measured on a 0–6 scale) of these actors, with red circles (and darker numbers) for those at the national level and blue circles (and lighter numbers) for those at the local level. The size of the circle represents the influence score, consistent with the number indicated. For some actors (donors, local government and trade union), two influence scores mean a range, indicating that the score varies across provinces. The different actors (in rectangles) are represented by different colors by type of organization: (1) national-level public institutions (yellow); (2) private sector, donor community, NGO, and academe (orange); (3) CARG and producer groups (blue); and (4) local-level public institutions (green). The lines connecting key actors represent the extent to which links and information flow between the actors (red lines represent information flow while blue lines represent the flow of policy advice; solid lines represent strong links while broken lines represent weak links). Organizations without an influence score were given a zero by respondents.

communication exist among various actors in the agricultural landscape (illustrated by the broken lines in Figure 8.1).

Interviews conducted and summarized in Ragasa, Babu, and Ulimwengu (2014) show that overall organizational and human capacities are also particularly weak in the DRC, with human capacity feeble at the MINRD and MINAGRI (the national and local levels). Of all the platforms and associations, CARG has the most inadequate human capacity. Other areas of capacity (including facilities and infrastructure, organizational systems, monitoring and evaluation systems [M&E], coordination, and communication

within organization) were rated weak or very weak, based on interviews with 45 stakeholders using a 5-point Likert scale (see Ragasa, Babu, and Ulimwengu 2014).

Of particular interest are the universities and research organizations that provide evidence-based analyses and planning for the ministries. Interviews conducted and summarized in Ragasa, Babu, and Ulimwengu (2014) show that the university system faces numerous challenges, including a disconnect between teaching and research by faculty and classroom training of students on the one hand and policy problems and realities in the field on the other. The stakeholders interviewed highlight decaying human capital, the lack of investment and funding in university, agricultural research, education and training, and extension systems that result in insufficient facilities, computer centers, and training materials. As suggested by respondents, training of staff should be accompanied by upgrades in infrastructure and equipment in these systems. It appears that there is need for systemic infrastructure investment and human capacity building in the agriculture sector, including extension services.

As indicated in Figure 8.1, according to the key stakeholders interviewed and summaries in Ragasa, Babu, and Ulimwengu (2014), the most influential agricultural policy decision-makers are the high-level policymakers and lawmakers (the president and the members of parliament) because they set national priorities which, in turn, influence the budget allocation and disbursement to the different sectoral ministries and public services. The next most influential is the Ministry of Budget, which decides on actual budget allocation for sector ministries, followed by the Ministry of Finance, which sets priorities on actual budget disbursement. The prime minister has strong influence in setting national priorities and agricultural policies. Donors are considered influential in the agricultural policy process. These are the common ratings of the key stakeholders interviewed (see Ragasa et al. [2013]).

The patterns of influence illustrated in Figure 8.1 suggest that greater attention is needed to ensure that compelling evidence from research and dialogues reaches the influential decisionmakers and funders. This highlights the required strengthening of policy dialogue and negotiation skills, among many other skills and competencies, at the key ministries. It may also require more systematic mechanisms of linking MINAGRI and these decisionmakers, such as initiating regular meetings with the agriculture advisers of the president and the prime minister, and to examine the reestablishment of the socioeconomic research committee, with emphasis on the agriculture and rural sectors, at parliament. It will require a more systematic and innovative means of

communication among these organizations. This implies that donors can play a major role in influencing policies in the DRC, taking care not to undermine the existing institutional structures and local ownership of these policies. It follows that institutional and policy reforms and funding for extension services will require similar strategies.

Numerous agricultural policies and programs were developed, although the episodes of political turmoil and conflict have disrupted their implementation. Table 8.2 shows the major agricultural policies and programs that began during the postcolonial period. As pointed out by Tollens (2004), many actions set forth by different governments to revive the agricultural sector and induce rural development since the DRC's independence have produced some positive, albeit insignificant, results. Most of the policies failed to be comprehensive and lacked internal coherence on which of the various interventions could have been articulated. Moreover, the lack of commitment from the government with respect to funding and implementation of these programs is evident across time.

The most notable is the Five-Year Plan (1986–1990), which was an ambitious long-term program, implemented to induce economic and social development and to achieve food self-sufficiency. It targeted agricultural development through the increase in size and productivity of peasant farms, promotion of entrepreneurship in the sector, intensification of extension and applied agronomic research, maintenance of feeder roads, and job creation and increase in incomes in rural areas. It is characterized by the move toward liberalism and the promotion of private initiative; promotion of partnership including the private sector, NGOs, peasants, small and medium agricultural firms, and donors; and presence of a detailed five-year investment plan supporting the general policy. Extension services were one of the major themes in this program. However, the implementation suffered, as did the previous ones, from a shortage of funds (that is, the government defaulted on its financing commitments).

To support the government of the Democratic Republic of the Congo, many externally funded programs operated in the 1970s and 1980s, and promoted agricultural technology transfer and advice to small producers, among others. Most notable among these programs are the World Bank–funded projects that were based on the training-and-visit method. In 1988 the National Extension Service (*service national de vulgarisation,* or SNV) was created to harmonize approaches and methods previously developed for various extension services and to integrate them into the ministry's day-to-day activities. However, starting with the unrest of 1991, which *(text continues on page 276)*

TABLE 8.2 Major policies after colonial period affecting agriculture and extension system

Major policies and programs	Year	Objectives and major components	Prominence of extension	Outcomes
Zairianization	1973–1976	Aimed at agricultural development, improvement of social conditions of farmers, and food self-sufficiency	Not prominent	Difficult transition; enormous abandonment of fields; plunge in agricultural production; selection of the new acquirers of the agro-industrial units was based on the political criteria rather than on the management skills of new owners
Radicalization	1974–1976	Aimed at transferring strategic agro-industrial units and large fields mismanaged by unskilled acquirers either to the state or to more skilled new acquirers; new government agencies were created to provide technical support to the sector and to ensure marketing of agricultural products	Not prominent	Failed to revive the agricultural sector as expected; agricultural research and extension were almost nonexistent; several agencies created to support the sector were nonoperational; most agro-industrial units were bankrupted; fall in production of all commercial crops except for coffee
Retrocession	1976–1978	Aimed at rehabilitation of bankrupt firms by focusing on providing financial and technical support		Limited success. Many owners of nationalized agricultural firms declined the invitation; productivity and production stagnation continued
Economic Revival Plan or Plan Mobutu	1978–1982	Aimed to revive the agricultural sector and other ones (mining, transportation, and energy), specifically, aimed at improving food security, increasing the production of exportable crops and of crops used as inputs by local industrial firms, and funding projects contributing to rural development. This was with support from IMF	Prominent	Limited success even with its 26 projects during the first phase (1979–1981) and 22 (1981–1983) during the second phase mainly because of funding shortage from the government

Major policies and programs	Year	Objectives and major components	Prominence of extension	Outcomes
Development Conventions	1979–1980	Aimed at inducing industrial and commercial large firms to contribute to agricultural development through the increase in agricultural productivity and the supply of basic inputs to the local agro-industry; the policy used several instruments including a special tax	Prominent	Limited success; the policy was selective and thus benefited somehow a few rural areas where the selected firms chose to operate; taxes led to increased prices of agricultural products, which was a disincentive among many firms to reinvest in the agriculture sector.
Agricultural Revival Plan	1982	Aimed at improving the partnership between the government and the private sector for a more rational management of the agricultural sector	Not prominent	Some success, but small farmers and other stakeholders of the agricultural sector were ignored
Interim Economic Rehabilitation Program	1983–1986	Aimed as a preparatory stage to the five-year plan (see below); first time that donors were seen as stakeholders; supported by the World Bank and the IMF; the involvement of the donors in the management of the sector included a diagnosis of previous agricultural policies and the identification of the causes of their failure		Some success; public investment plan under this program were funded and included 68 agricultural projects (including forest, livestock, and fishery); government defaulted on its financial commitments
Five-Year Plan (Plan Quinquennal)	1986–1990	Aimed at agricultural and rural development through the increase in size and productivity of peasant farms, promotion of entrepreneurship, job recreation in rural areas, intensification of extension and applied agronomic research, and maintenance of feeder roads	Prominent role of extension	Limited funds; government defaulted on its commitments
Master Plan	1990–2002	Aimed at achieving agricultural and rural development through participatory approaches; rehabilitation of rural infrastructure, improvement of the supply of inputs and credit; funding the agronomic research and extension; and improvement of agricultural markets and agro-processing	Very prominent role of extension	Political instability prevented its implementation

(continued)

TABLE 8.2 Continued

Major policies and programs	Year	Objectives and major components	Prominence of extension	Outcomes
Agricultural Policy Code (Note de Politique Agricole)	2009–2013	Aimed at reducing poverty and hunger by 50% by 2015 (MDG goal); specific objectives: 10% of the government budget going to agriculture to meet the Maputo commitment; MINAGRI restructuring; decentralized agricultural service provision; improvements for financial services; and promoting agricultural entrepreneurship	Very prominent role of extension	Targets not achieved. Funding for agriculture remains low and government commitment continues to be lacking
National Agricultural Investment Plan	2013–2020	Its overall objective is to stimulate sustained annual growth in the agricultural sector of at least 6%, which is required to reduce poverty, to ensure food and nutritional security in the DRC, and to generate sustainable jobs and income. Main components are as follows: • Promote agricultural value chains; • Develop and disseminate research products to users; • Improve sector governance; • Promote gender mainstreaming, and strengthen human and institutional capacities; • Reduce the vulnerability of the agricultural sector to climate change.	About 12.9 percent of the budget was allocated to research and extension	The government failed to mobilize required resources for the program. As a result, the program has been implemented piecemeal and is difficult to assess.

Source: Authors' compilation based on Tecsult International (2009) and DRC, MINAGRI (2013).
Note: MDG = Millennium Development Goals; MINAGRI = Ministry of Agriculture.

brought a nationwide crumbling of institutions and withdrawal of most donor support, SNV institutional capacities were weakened and ceased to function almost immediately. This gave way to an emergency model of extension services through NGOs stepping in to fill the gap, often without the adequate experience and capacity previously brought by SNV. As a result, the system was plagued with inefficiencies, redundancies, and confusion due to

conflicting messages to farmers on a specific issue or technology highlighted by the interviews with farmers' organizations and CARG members (see also Tecsult International 2009; Ragasa et al. 2013).

The political instability that has characterized the country since 1990 has not allowed a full implementation of any agricultural policy. In 1990 an agricultural strategy, known as the Master Plan, was developed although never implemented. The Master Plan was a comprehensive and coherent agricultural and rural development policy involving all agricultural sector stakeholders. It represented the first time the DRC implemented the decentralization of services and restructured the functions and staffing of the MINAGRI. Improvement in the provision of extension services, through SNV, was a major component of this policy. Despite its coherence, the program was never implemented due to political and social unrest.

In 2003, after the war, new political leadership expressed interest in implementing the Master Plan. However, the context was totally different politically and economically for this policy to fit. New policies were implemented, although at a rather slow pace. Moreover, as part of the billions of dollars in the form of international assistance security, humanitarian, stabilization, peace-building, and economic recovery interventions, many donor-supported projects have been implemented targeting the agriculture and rural sectors. In 2009 a new policy document, referred to as the Agricultural Code, was drafted. It outlined planned reforms and takes into account the new challenges and the environment faced by the agricultural sector. The code aimed to reduce poverty and hunger by half by 2015 (Millennium Development Goal) with the specific objective to achieve 10 percent of the government budget going to agriculture to meet the Maputo commitment. Among other things, the three major components of this code were the decentralization of agricultural services, the restructuring of MINAGRI, and the implementation of the CARGs. However, this code remained in draft form and has never been implemented.

Under the Comprehensive Africa Agriculture Development Programme (CAADP) initiated by the New Partnership for Africa's Development (NEPAD), a socioeconomic flagship Program of the African Union (AU), the DRC government developed National Agricultural Investment Plan (NAIP) for 2013 through 2020. After years of sluggish growth in the sector, accompanied by rapidly growing food imports that reached US$1.2 billion in 2012, the trend could be reversed thanks to a new political will, expressed by the commitment to the CAADP process, the signing of the CAADP compact, and the design of a US$5.7 billion NAIP to cover the 2013–2020 period.

The remaining challenge is to increase the share of the national budget going toward agriculture to reach 10 percent, per the Maputo engagement.

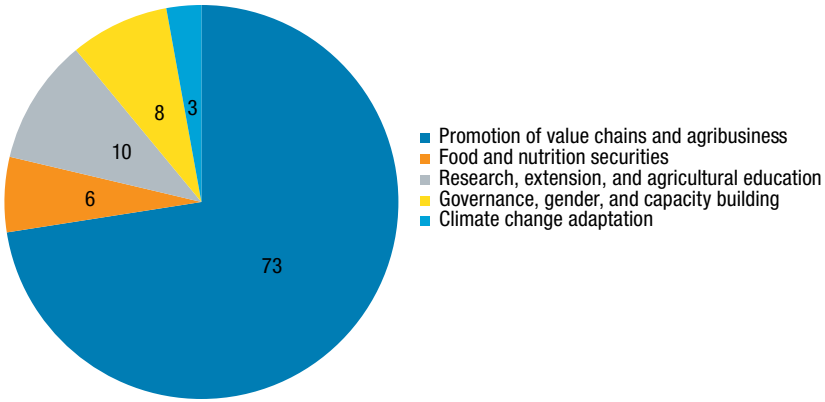
The DRC government has expressed a commitment to engage significantly more domestic resources as part of the CAADP compact and its NAIP 2013–2020, of which 10 percent of the funds will go to agricultural research, extension services, and education. Aside from this, extension services and training will be an essential component in major programs on value-chain promotion and climate change adaptation. The distribution of planned funds by subprograms is given in Figure 8.2. A focus of the NAIP is to encourage private-sector investment, including foreign investors and home-grown medium and large agribusinesses.

In particular, the vision to move the country toward a green revolution entails a two-track approach. The first track consists in transforming small-scale subsistence farmers into commercial farmers by (1) increasing production through access to improved genetic materials (seed breeds), fertilizers, finance, and technology; and (2) reaching markets more efficiently by enabling producer cooperatives to identify markets, pool resources, add value, negotiate contracts, and access feeder roads and storage facilities. This all while ensuring that development does not infringe on ecologically sensitive areas. The second track consists in restarting private investment in commercial agriculture using modern technologies geared toward agro-processing and exports. The government aims to attract private investment in agro-industrial parks, where it plans to provide basic infrastructure (transport, water, power, ICT) and a transparent administrative and fiscal framework (for example, land titles and special economic zone status). This safe haven approach is piloted in peri-urban Kinshasa. There is potential for combining small-scale agriculture and large-scale agro-industries through contract farming and by supporting mid-size operators in relevant value chains and regions. The productive alliance model will be tested in new operations to reinforce the commercialization of products and ensure market integration of small farmers. Extension services are strongly featured in both tracks. Pilot implementation of these are ongoing and yet to be evaluated.

Extension Policy and Structure

There is no existing national extension policy and strategy in the Democratic Republic of the Congo. The extension system described in the 1988 and 1993 decrees point to three systems involved in the provision of extension services in the DRC: (1) national extension services (SNV) for coordination with national headquarters and a coordinating team in each province; (2)

FIGURE 8.2 Available funds for the National Agriculture Investment Plan by subprogram (%)



Source: DRC, MINAGRI (2013).

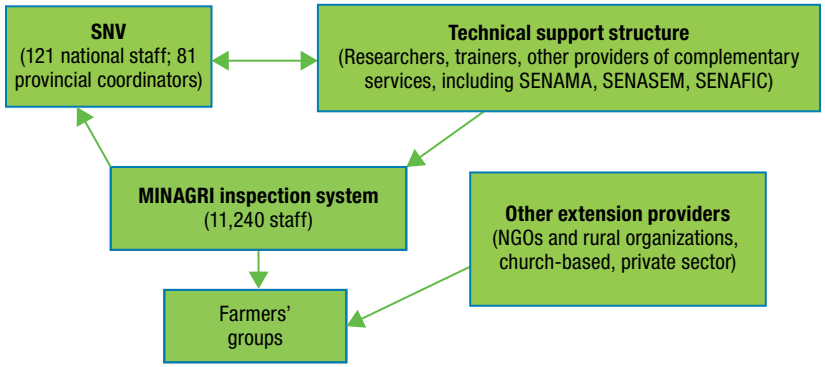
supporting structures, including researchers and specialists, for training and technical backstopping, as well as INERA (the National Agronomic Research Institute), SENAMA (the National Mechanization Agency), SENASEM (the National Seed Agency), and SENAFIC (the National Fertilizer Agency); and (3) agricultural inspection system within the MINAGRI, with an estimated 11,245 field staff, complemented by agricultural workers from NGOs for the actual delivery of extension services to rural communities (Figure 8.3).[4] The number of field staff in the system is still in the payroll, but most operations have ceased after the donors' financial support ended in 1997.

Coordination and Pluralism

In 1988 the SNV was created to coordinate, harmonize, and support rural extension services activities as an independent unit within the National Rural Development Department, with their own budget, to institutionalize the earlier National Extension Program. In 1993 another decree was passed to grant administrative and financial autonomy to the SNV under the umbrella authority of the MINAGRI. During its early implementation (in the late 1980s), the SNV had 121 staff at the national level, and 82 coordinators and officers assigned to the different provinces. The SNV was tasked to develop extension services materials and production guides and to regularly update

4 A census survey conducted in 2005 within MINAGRI reveals that the total number of staff was estimated at 18,500, of which 11,245 is said to be composed of qualified extension agents (DRC, MINAGRI 2005).

FIGURE 8.3 Agricultural extension system in the Democratic Republic of the Congo



Source: Authors; 1988 and 1993 decrees creating SNV.
Note: MINAGRI = Ministry of Agriculture; SENAMA = National Mechanization Agency; SENASEM = National Seed Agency; SENAFIC = National Fertilizer Agency.

them, to provide training and backstopping, based on these extension services materials, and to coordinate and monitor extension services provision.

From 1989 to the mid-1990s, the SNV was financially supported by the DRC government as well as by international organizations including the World Bank, the French aid agency Agence Francaise de Developpment, the United Nations Development Program (UNDP), and the Food and Agriculture Organization of the United Nations (FAO). By the mid-1990s, donor support ended and government funds were substantially reduced. From 1997 to 2001, funding came solely from the government and mostly went to pay for salaries. Starting in 2002, there was no operating funding available from any source and staff salaries were not regularly paid. This made it difficult for the SNV to fulfill its mandate, given that staff of the agricultural inspection system does not fall under the supervision of the SNV; neither could the SNV train staff nor provide other relevant services without budget support. Despite preparing and submitting budgets each year, the SNV has not been able to garner any sort of financial support from within or outside the government. SNV staff has remained unpaid for years, although employees have kept their positions while looking for other means of economic survival. A sizable portion of staff remains untrained in newer approaches to transmitting improved technologies to farmers, and members have now passed retirement age.

The current extension system in the Democratic Republic of the Congo is characterized by a largely uncoordinated system, with a largely underfunded public system that has an extensive field staff still on its payroll. The system

has numerous NGOs, church-based organizations, or producer organizations that are trying to fill the gaps, mostly with ad hoc and project-based funding. In terms of pluralism, results show that 55 percent of the surveyed extension organizations are government agencies (different locations of MINAGRI or MINRD) and 45 percent nongovernment (one-third of these are NGOs; private sector and producer associations represent about 6 percent each; church-based organizations account for about 3 percent) (Table 8.3). This indicates that coverage of NGOs is still limited, and government agents are still the dominant source of extension services in the rural areas in various territories and sectors in western DRC. Moreover, government agents are also sometimes employed as agents for NGOs to implement their projects. This indicates limited pluralism of extension services in the DRC.

Overall, linkages between extension organizations and between their agents and other stakeholders are rather limited. Absence of interactions with any rural bank and financial institution was reported by the extension agents, organization heads, and supervisors. Almost all of the sample extension agents have neither interacted in the previous year with central MINAGRI staff, financial institutions, other extension agents, nor input suppliers (Figure 8.4). Similarly, only 7–8 percent of supervisors of extension organizations have met with agro-processors or financial institutions only a few times a year. About 80 percent of surveyed extension organizations have never interacted in the previous year with input suppliers, traders or buyers, colleges and universities, and research institutes. The only set of actors with which a majority of sample extension agents met in the previous year was other extension agents (36 percent of sample extension organizations). Given that extension agents are the brokers of information and bridge the gap between users and sources of innovation, their lack of interaction or linkage with other organizations and stakeholders poses a serious issue in the fulfillment of their role in strengthening the capacity of farmers and achieving agricultural growth.

8.4 Organizational Capacity and Management

The majority of respondents (83 percent) reported having a planning process for their activities and operations. In terms of performance targets or indicators, only about 24 percent of extension agents are reporting any target set by supervisors or heads. About 20 percent of these targets relate to some kind of outcome (yield improvement), while the rest are associated with training and other supports. Performance indicators and targets remain at the level of input/output and only a few use outcome and impact indicators.

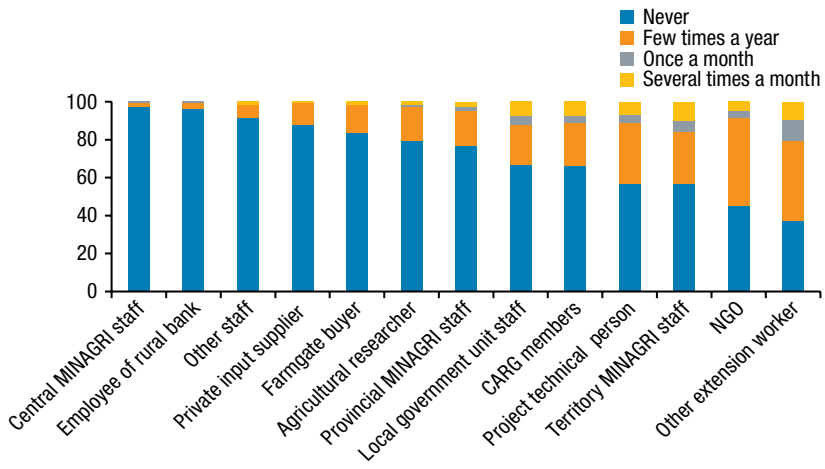
TABLE 8.3 Distribution of sample organizations and agents interviewed

Type of organization	Agriculture extension organizations		Agriculture extension (extension services) agents	
	(Number)	(%)	(Number)	(%)
Government (different locations)[1]	59	55	114	70
Nongovernmental organizations[2]	33	30	25	15
Private sector[2]	6	6	9	6
Church-based organizations[2]	3	3	6	4
Farmer-based organizations[2]	6	6	8	5
Total	107	100	162	100

Source: IFPRI survey (August–October 2011).

Note: 1. Different locations (territories or sectors) of MINAGRI or MINRD. 2. There is an unclear distinction between NGO, church-based organizations, private sector, and rural producer organizations. The classification retained here is what the respondents reported, although it is likely that respondents belong to the other types of organizations.

FIGURE 8.4 Distribution of extension agents based on frequency of interaction with other actors (%)



Source: IFPRI survey (August–October 2011).

Note: MINAGRI = Ministry of Agriculture; CARG = Agricultural and Rural Management Council.

Table 8.4 highlights a few key responses from extension agents concerning supervision and incentive systems. Two-thirds of extension agents claimed that their supervisors visit them in the field, and they reported that on average the frequency of supervisors' visits is four times during the past quarter. However, a third of extension agents were not visited by a supervisor. The enforcement of the incentive system (reward or sanction), based on

TABLE 8.4 Distribution of extension agents based on perception on supervision (n = 162 agents)

Statements	Percentage that agree or strongly agree (%)
Supervisor visits you in the field.	67.3
Supervisor is satisfied with your work.	95.1
Supervisor knows enough about your daily activities.	93.8
Supervisor is always around when needed.	87.0
Know someone in the office subject to sanctions for poor performance.	14.8
Have ever received an award for good performance.	10.5
Farmers never complain about the performance of the organization.	69.1

Source: IFPRI survey (August–October 2011).

performance, is also very weak: only 15 percent of extension agents know someone in his or her office who was subject to sanctions for poor performance or unprofessional conduct, and only 10 percent of extension agents have received or know someone who received a reward for good performance.

Human Capacity and Incentives

Field staff in the DRC totals 11,245, according to estimates, most of which is comprised of those referred to as agricultural monitors or frontline workers. These are mandated to work directly with rural communities. At the sector level they are supervised by sector agronomists and veterinarians who report to agricultural and veterinary inspectors at the territorial level, who in turn report to the provincial directors and inspectors.[5] In provinces where the decentralization policy is not fully implemented, there are also agricultural and veterinary inspectors at the district level.

Estimates suggest that there are about 6 million farming households, around 15 million farmers, and 39 million in the agricultural population in the DRC (FAO 2010). Thus the DRC has about 535 farmers per extension agent or 3,400 agricultural population per extension agent. These two ratios for the country are an improvement over those in India, Nigeria, and Tanzania (see Figure 6.2 in Chapter 6). Moreover, one of the two ratios is higher in the DRC than in China and Indonesia. Anderson and Feder (2004) show that the farmer-to-agent ratio in most developing countries is more than 1,000:1. This signifies that the number of extension agents or

5 A "sector" is an administrative level between a territory and its villages.

the farmer-to-agent ratio may not be the major issue; rather, it falls on how to manage the available human resources while providing them with a clear vision, incentives, and funding.

With respect to the profile of field staff, 78 percent has higher than a secondary or high school degree (Table 8.5). A large majority (57 percent) of field staff from government has vocational training or a three-year agricultural college degree. In contrast, most of field staff from NGOs have a university degree. Across all organization types, a substantive proportion of field staff (22 percent) has only a primary or secondary degree.

A full 61 percent of extension agents received other professional training besides formal education (Table 8.6). There are more extension agents (more than 80 percent) in NGOs and church-based organizations that have received training than in the government, private sector, or producer organizations. Across all respondents, a greater proportion of extension agents with lower formal education (primary or high school) did not receive on-the-job or skills development training compared to those with a higher education level. This reinforces the serious challenge of weak skill sets of a good proportion of extension agents due to a lack of formal education and technical training. For those who received on-the-job training, most of the training sessions were in areas of crop production, general education and communication, monitoring and evaluation, and general management.

An overwhelming majority of extension agents and managers/supervisors in extension organizations are trained and specialized in crop production. About 13 percent of extension agents specialize in livestock and veterinary services, and 3 percent specialize in fisheries and aquaculture. No extension agent reported specialization or training in postharvest or extension services marketing. Field staff should also be trained to have marketing skills so that they can provide extension services marketing among farmers. Furthermore, the skill set should include food preparation as well as nutrition and health advice to prepare mothers and adults on how best to utilize their existing food production and resources to maximize the nutrient intake of their children. Overall, extension agents should be trained in a diverse set of skills so that they can respond to the widely varying challenges and bottlenecks faced by farmers.

Numerous organizations have been providing ad hoc, short-term training to extension agents and rural development workers. Of all the training attended by the extension agents interviewed, more than half are offered by donors or international organizations; around 21 percent are given by government agencies such as MINAGRI, SNV, MINRD, and MINHEALTH,

TABLE 8.5 Distribution of agents by type of organization and level of education (%)

Organization type	Primary	Secondary	Vocational/ college	University
All respondents (n = 162)	**4**	**18**	**47**	**31**
Government (n = 114)	2	17	57	25
Nongovernmental organizations (n = 25)	8	16	20	56
Church (n = 6)	17	17	33	33
Private sector (n = 9)	11	33	11	44
Farmer-based organizations (n = 8)	0	25	50	25

Source: IFPRI survey (August–October 2011).

TABLE 8.6 Distribution of agents by training received and organization type (%)

Organization type and education level	Primary	Secondary and high school	Vocational and technical	University	Other professional training
All respondents	**33**	**59**	**52**	**80**	**61**
Government	0	53	51	79	57
Nongovernmental organizations	50	100	100	86	88
Church-based	100	100	50	100	83
Private sector	0	67	0	50	44
Farmer-based organizations	0	0	25	100	38

Source: IFPRI survey (August–October 2011).

and another 21 percent are from national NGOs and other local organizations. Only 5 percent of the training is from the education system, including the Rural Development Institute/Agro or Agro-veterinarian Studies Institute/College (ISDR/ISEA), and less than 1 percent is provided by the agricultural research stations (INERA). The issue with the training is that it has been provided on an ad hoc basis and in an uncoordinated manner, leaving the capacity of the agricultural training and education institutes largely weak and underfunded.

A major concern with skills development programs and the capacity of field staff is the serious weakness in the agricultural training and education system in the country. Within the Ministry of Education, Agro or Agro-veterinarian Studies Institute/College (ISEA/ISEAV) and the ISDR are the government institutions that offer agricultural training and education, which are responsible for training agricultural extension agents and rural development workers. ISEA/ISEAV trains agricultural technicians (agronomists and veterinarians) while ISDR trains rural development workers. Almost

all territories have at least one ISEA or ISDR. In some cases, farmers' organizations also go to them directly to request training, oftentimes at a fee. Moreover, students taking their practicum to the villages is a useful way to disseminate technology packages and production techniques to farmers. In these cases, ISEA and ISDR are potentially useful pathways of technology dissemination and extension services delivery that can be explored more.

However, a closer look at some of these institutes (Ragasa et al. 2013) highlights the following challenges in agricultural education and training in the DRC: (1) lack of sustained funding; (2) no strategic planning that match the sector needs, and forward-looking mentality for ISDR/ISEA, in particular, and the education system in the DRC more generally; (3) outdated curricula; (4) problems of quality of education starting at the primary level; (5) lack of up-to-date training and skills development for staff; and (6) lack of linkages with the rest of the agricultural support system, including extension services, research, and universities.

The average age of extension agents in the sample is 52 years. About 60 percent of the extension agents is older than 50; 44 percent is older than 55. The extension agents in the government are relatively older, while those from NGOs and FBOs are relatively younger. About 51 percent of agents in government are older than 55, compared to only 16 percent in NGOs and 13 percent in FBOs. About 29 percent of agents from government are older than 60, while there are only 12 percent in NGOs and 13 percent in FBOs.

Only 5 percent of the random selection of extension agents is made up of women. Of all the extension services supervisors/heads interviewed, only 7 percent are women. There was no female supervisor or head from public-sector agencies. There is a limited dataset on female and male farmers' differentiated access to extension services, although evidence from the literature with regard to many countries suggests a strong correlation between the sex of the agent and the gender differential in access to extension services. Gender-based constraints, such as social norms that limit women's school attendance or mobility, also limit their opportunities and willingness to work as extension agents. It may be difficult at the practical level for a married woman to work in a rural area away from her husband and family or to find appropriate housing and schooling for her children.

In addition to capacity, incentives are critical for performance. In an attempt to measure financial incentive and compensation among extension agents, agents were asked about the various sources and types of compensation in exchange for their extension services work. About half of them receive

a basic salary. They reported receiving 75,000 Congolese francs (CF) (roughly US$78) per month as a basic salary, on average, although it could range from 15,600 CF to 921,000 CF per month across agents (Table 8.7), way below the country per capita GDP of US$460.

NGOs can use stronger incentives than a government extension agent receives (see Table 8.8). The salary of public-sector extension agents is seriously low. To put this into context, the daily farm labor wage is from US$0.5 to US$3.5, which on average is higher than the salary of extension agents in the public sector. About half of the extension agents interviewed reported receiving some kind of bonus or commission in cash for their extension services work. Agents reported receiving 22,000 CF per month as a cash bonus per month, although this ranges from 800 CF to 78,000 CF per month across the agents. This indicates additional financial incentives for extension agents, although the total cash compensation reported is still not much compared to the DRC cost of living. Only 3–5 percent of extension agents interviewed reported any in-kind compensation in the form of a gift for their extension services work from farmers or other clients.

Financial Resources

Due to the irregularity of funds disbursed by the government, more than half (54 percent) of government-based extension organizations reported no funding at all since 2009 from government. Only 2 percent of government-based extension organizations obtained operating funds from government since 2009; and only 7 percent received capital funds since 2009. More than half (51 percent) of government-based extension organizations received no funds from any source since 2009. Only 23 percent of extension organizations (all types) received external funding (international NGOs, donors, private sector, or foundations) (Table 8.8). The greatest proportion of extension organizations that received external funding are NGOs. Among government-based ones, only 5 percent obtained external funding. None of the farmer-based organizations (FBO) received external funding. Still, a large proportion of NGOs, church-based organizations, private sector and FBOs do not get funding to do extension services. For government-based extension organizations, more than half do not get funds from government, and only 5 percent receive them from other sources. This still left about half of the government-based extension organizations without any type of funding for their operations and extension services work in 2009 or 2010. Respondents stated that this has been the case for several years.

TABLE 8.7 Descriptive statistics of financial compensation received for extension provision (Congolese francs)

Compensation type	Number	Mean	Standard deviation	Minimum	Maximum
Basic salary	86	75,497	105,527	15,600	921,000
Bonus	73	22,468	17,253	833	78,000
Commission	1	5,000	na	5,000	5,000
Total number of organizations	107	76,056	97,892	833	921,000

Source: IFPRI survey (August–October 2011). na = not applicable.

TABLE 8.8 Distribution of extension organizations by external funds received (%)

Organization type	Received external funds	Did not receive external funds
Total	23	77
Government (different locations)	5	95
Nongovernmental	61	39
Church based	33	67
Private sector	17	83
Farmer based	0	100

Source: IFPRI survey (August–October 2011).

Physical Resources

The dismal state of the DRC's transportation infrastructure also hinders the performance of extension services. Although 81 percent of extension agents believe that the workload is adequate, only 40 percent feel that travel time to farms is manageable, and 47 percent report that mobility to their operational area is difficult (Table 8.9). Supervisors estimate that, on average per month, 55 percent of extension agents' time is spent getting to the field. This discrepancy is likely to be not only due to poor road conditions but also to the fact that extension agents are not provided a travel allowance and bikes or vehicles as a result of insufficient funds. While a motorbike is a common mode of transport for extension agents in many African countries, survey results indicate that 91 percent do not have access to either a bike, motorbike, or vehicle for work.

Extension Approaches

The main approach is still heavily based on the training-and-visit system, remnants of the World Bank–supported program from the 1980s. The survey

TABLE 8.9 Distribution of extension agents by transportation challenges

Statement	Percentage agree or strongly agree (%)
Workload is adequate.	81
Farm distances from where you stay are manageable.	40
Mobility to your operational area is difficult.	47
Do not have access to a motorbike or vehicle for work.	91
Amount spent per month on mobility for job (CF)	21,600
Amount received in travel and transport per month (CF)	18,545
Estimation of extension agents' time spent for getting to the field in a month (%)	55

Source: IFPRI survey (August–October 2011).
Note: Total number of agents = 162.

of 162 field staff in western DRC reveals that the most common method of delivering extension services is field staff visits to farms or homes, followed by visits and information sharing at farmer-based organizations, training sessions, and demonstration farms. NGOs and farmer-based organizations make more frequent visits and meet with other FBOs, training sessions, and demonstration farms, while government, church-based organizations, and the private sector make more frequent visits to farmer's fields or homes than those from other organization types. The survey results indicate that 74 percent of field staff hold special meetings, such as planning meetings, where farmers can express which types of activities they expect to carry out. These meetings are usually held at the community or sector levels. Field staff activities also include the formation, mobilization, and support of FBOs.

Regarding the distribution of inputs, together with the provision of extension services, a quarter of surveyed field staff from government extension services in western DRC reported that inputs were distributed, while more than half of field staff from NGOs and all field staff from farmer-based organizations reported distributing inputs. This indicates that nongovernmental field staff often has a more integrated approach to service delivery and tends to focus more on the complementarity of inputs, technical knowledge, and extension services for farm management.

In eastern DRC, where numerous donor-funded projects have been implemented, the use of radio and innovation platforms (IPs) are common methods in disseminating information on agricultural management practices. IPs assemble stakeholders to share information, identify opportunities, discuss challenges, and agree on joint activities relating to a shared interest, often with a specific commodity focus.

Farmer-centered approaches have also been implemented, although at a small scale to date. The most common of these approaches is farmer field schools (FFS).[6] These approaches rely on the higher involvement of farmers and producer organizations to identify issues at the local level, define adaptive research and on-the-farm trial needs, implement trials, and disseminate appropriate technologies. In western DRC, half of field staff from government interviewed reported teaching or facilitating in farmer field schools; while 64 percent from NGOs and only 17 percent from farmer-based organizations use farmer field schools (or at least in theory). However, key informant interviews and visits to some farming communities suggest limited participation in FFS, and the commonly cited constraint is the lack of trained facilitators.

8.5 Performance of Extension Organizations, Producer Organizations, and Extension Agents

Ragasa, Ulimwengu et al. (2016) modeled the variation in performance among 107 extension organizations and 167 extension agents. The performance indicators collected were the number of farmers trained, number of villages visited, number of technologies disseminated, number of trainings conducted, number of demonstration plots organized, and number of training materials produced and disseminated. In the survey the research team used the French translation *technologie agricole*, and used examples such as improved varieties, fertilizer use, fertilizer timing and application methods, planting methods, disease and pest control techniques, and soil fertility management practices. Half of the sample extension organizations reported having disseminated at least one new technology or improved management practice, and 55 percent of extension organizations reported organizing farm demonstrations in the past two years. While 82 percent of extension agents reported having taught and disseminated at least one technology or improved management practice in the past two years, only 52 percent of agriculture extension agents reported having monitored farmers' adoption of these new technologies

6 A FFS is a group of 20 to 25 farmers with associated land (usually 0.5 to 1 hectare) who are trained in the field following the various stages of development of a given crop, based on field observations and analyses. The objectives are to strengthen the capacities of farmers themselves to identify/solve problems encountered during crop production, and reinforce their organizational capacities to further manage their own development. Main principles are as follows: FFSs are assisted through local organizations (farmers' organizations, women's groups, local NGOs) in which resources persons are identified and trained in the method; FFS facilitators (two farmers per FFS) receive specialized training each month in crop development and disseminate it in the field to other members; inputs given to conduct trials and FFS organizations are managed by an FFS committee; and FFSs should rapidly become financially self-sustained.

disseminated and only 19 percent of extension agents reported having monitored the impact of these technologies on farmers.

Ragasa, Ulimwengu et al. (2016) show some lessons that can be learned on improving the performance and effectiveness of extension organizations and agents. Significant factors explaining agent's performance include (1) external funding received; (2) linkages and interactions with others; (3) training received; and (4) presence of performance targets and enforcement of reward and sanction systems based on performance. Those explaining the performance of an organization are (1) external funding received; (2) linkages and interactions with others; (3) presence of performance targets and enforcement of reward and sanction systems based on performance; (4) proportion of female staff in the organization; and (5) proportion of time spent by field staff accessing farms and farmers. Ragasa and Golan (2014) analyzed the performance of 181 rural producer organizations (RPOs) in service delivery and found that management training has a positive effect on performance and increases the probability of the RPO providing advice and marketing to its members.

Results show that extension organizations with performance targets are more likely to perform well in terms of extension provision and monitoring technology adoption and impacts on farmers. Extension organizations with performance targets have 26 percent higher probability to conduct training and visits compared to those without targets. Extension agents in organizations with performance targets have 13 percent higher probability of being active in technology dissemination and rural education than those without performance targets. Results show strong evidence on the importance of linkages and interaction in organizational and individual agent's performance. Extension agents and organizations that interact and link more to other actors and organizations are 11–33 percent more likely to perform well in technology dissemination, training, farm demonstration and monitoring adoption, and impacts on farmers than those that did not have any interactions. Similarly, Ragasa and Golan (2014) found that the greater the interaction with external actors, the greater is the likelihood that services and information are provided to members through the RPOs. Interacting with external organizations increases directly the probability of providing inputs and advice by 17 percent, but there is no direct effect of external interaction on marketing of outputs. These findings are consistent with other studies (Bernard et al. 2008; Karami and Rezaei-Moghaddam 2005). This finding suggests that there is a need for greater recognition of the importance of linking with other actors that are potential sources of services, information, technical support, and market

outlets. Policies and investments to help RPOs link more to each other and to others are critical. From the supply side, interventions to strengthen the capacity of service providers and external actors (government, NGO, church based, and private sector) will be needed to complement strategies supporting linkages.

Strong institutions and management systems are positively correlated with RPO performance. Especially in the context of weak capacity and institutions in fragile states, external support during setup appears crucial for performance, and it also increases an RPO's capacity to link to external actors. This is consistent with a general consensus in the literature that collective action may as well not emerge at all in the absence of external interventions (Varughese and Ostrom 2001). The widespread lack of capacity and high levels of illiteracy among the rural population in the DRC may make external assistance in setting up groups, raising community awareness, and mobilizing collective action central for the performance and viability of these RPOs.

There is no conclusive evidence that the number of staffs in the extension organizations is a statistically significant factor in explaining good performance in terms of extension service provision among extension agents and organizations. However, there is some evidence that training received by extension agents and gender balance in staffing in extension organizations matter in performance. Extension agents who received training are 6–18 percent more likely to be active and perform better than those who did not receive training. Extension organizations with female agents are more likely to be active and perform well in extension service provision compared to extension organizations without female agents. A 1 percent increase in the proportion of female agents in extension organizations is associated with a 1 percent increase in the probability of good performance in technology dissemination and farm demonstration among extension organizations.

The statistical analyses suggest that the availability of financial resources, especially in the form of external funding, is a strongly significant factor in explaining good or poor performance among extension organizations and agents. Extension organizations that received external funds are more likely to be active and perform well in extension service provision. Extension organizations that received external funds have 33–48 percent higher probability to conduct farm demonstrations and promote training materials in rural areas compared to the extension organizations that did not receive external funds. Extension agents that received external funds have 18–56 percent higher likelihood to be engaged in technology dissemination, rural education, monitoring farmers' technology adoption, and monitoring technology impacts on

farmers. It will be therefore crucial to support knowledge provision and agriculture extension through external funds in the coming few years, but the government could start streamlining its human resources to free some resources from salary to operating and capital funds.

Based on these results, we conclude the following interventions can help improve the performance of extension agents and organizations:

1. First, training opportunities have been proven to be important in performance as confirmed by findings in several studies. Especially in the case of the DRC, where almost a quarter of agents only have primary education and the majority of government agents have no university degree, regular training is extremely important and needs to be institutionalized rather than being provided as an ad hoc activity. Also, agricultural extension system relies on the strength of the agricultural education system, and therefore any efforts to revitalize the former need complementary investments in the latter.

2. Second, linkages and partnerships have been shown to be important in extension performance. Interactions with other extension agents, NGOs, agrodealers, and agribusiness, and local political authorities are particularly important. This finding suggests that there is a need for greater recognition of the importance of linking with other actors that are potential sources of services, information, technical support, and market outlets. Policies and investments to help extension agents and organizations link more to each other are critical. For example, providing means of transportation, better roads, and reducing the time and transaction costs for extension agents to go to the field, visit farmers and interact with other actors has been shown to be important based on the analysis.

3. Third, clear direction and vision, coupled with measurable targets, are extremely important. With clear mandate and clear definition and communication of roles and responsibilities and with corresponding performance-based incentive mechanism, the weak extension system can be transformed into an efficient system that supports knowledge dissemination and technology transfer.

4. Fourth, with the absence of government funding, external funding has been crucial for the functioning of the extension system. External funders such as donor agencies and international NGOs also tend to put conditionality and more emphasis on monitoring adoption and

impact, and this has implications on the importance of their support for a transition economy such as the DRC. However, as has been proven in the past decades of neglect on extension in the DRC, the short-term support from external actors is extremely important but it needs to be supported and continued by the government for sustainability.

5. Fifth, the analysis suggests a strong correlation between having female agents in extension organizations and performance in service provision that confirms results of past studies. In places where female heads and agents are a few such as in the case of the DRC, focusing on girls' education and recruiting more women students and graduates to work on agriculture and on extension will be an important strategy.

8.6 Evidence of Effectiveness and Impact of Extension Services

Access to Extension Services

Since no national or subnational dataset is available, indications of access to extension services and extension performance presented here include (1) activeness in technology transfer and (2) visits made to the villages, as reported by the village representatives. Approximately half of the 107 extension organizations included in the survey reported that they had not disseminated or promoted any agricultural technology in the previous two years. An even greater proportion of government extension agencies had not promoted or disseminated technologies to farmers in the previous two years. This mirrors limited activity by a good proportion of extension organizations. Only 17 percent of the sampled villages reported having had visits from any extension agent or development worker (Table 8.10) in the previous two years (2009–2010). A large majority (83 percent) of villages reported not receiving any extension visits. Of those receiving visits, about 70 percent of the villages reported a single agent who visited and provided extension services, and 19 percent of the villages reported being visited by two extension agents, with the remaining 11 percent reporting having been visited by three to five extension agents. These agents come mostly from MINAGRI and NGOs. Of the 43 extension agents who visited the sample villages, only 9 percent were women.

This poor performance is not only for extension services but the agricultural sector overall. AU-DREA (2017) show that the Democratic Republic of the Congo is the lowest score among various countries in country

TABLE 8.10 Distribution of sample villages and extension visits by number of visits

Category	Number of villages	Percentage of total villages
No visit by extension agent	129	83
Visited by at least one extension agent	27	17
Number of agents who visited		
1	19	70
2	5	19
3	1	4
4	1	4
5	1	3

Source: Village-level survey implemented by IFPRI in 2011.

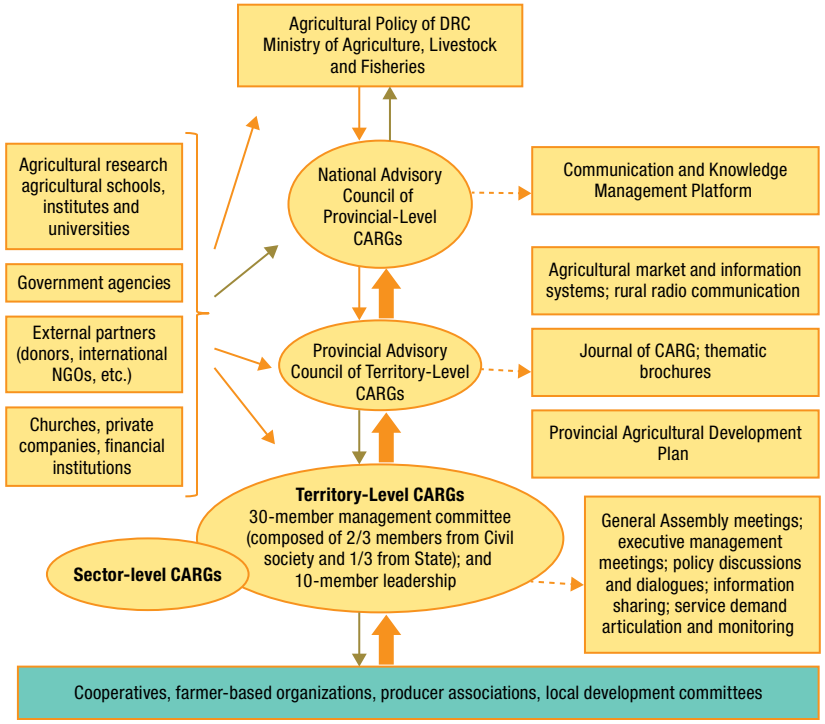
performance according to the Malabo Declaration. They recommend that the DRC should facilitate access of men and women engaged in agriculture to fertilizer, financial services, and agricultural extension services as one of the key interventions to enhance investment in the sector. They recommended that the DRC increase its spending in the agriculture sector toward these recommended interventions and to meet the CAADP target of 10 percent of the national budget. There are no national or subnational datasets available but there are smaller datasets and past studies that provide empirical evidence of effectiveness and impact of agricultural programs and extension approaches to help guide the investments in these areas.

Agricultural and Rural Management Councils

One of the major initiatives on agriculture and extension services is the Agricultural and Rural Management Councils (CARGs). The Belgian Technical Cooperation and various donors and NGOs have supported the establishment of more than 140 CARGs across the country since 2008. The CARGs are councils and forums of consultation that aim to improve planning and policy processes through the participation of stakeholders in the design, implementation, and monitoring of agricultural policies and programs, including demand articulation and coordination of agricultural extension services. CARGs operate at the local (territorial) level, which is equivalent to a district in many countries and is at a level of government just below a province (which reflects the level of decentralization in the DRC) (Figure 8.5).

In theory, CARGs are expected to (1) organize and facilitate dialogues for information sharing and problem solving, including such topics as harassment

FIGURE 8.5 Structure of the Agricultural and Rural Management Council



Source: Created by the authors, modified from Ragasa, Badibanga, and Ulimwengu (2016) and CARG (n.d.).

Note: CARG = Agricultural and Rural Management Council of the Democratic Republic of the Congo. Thin solid lines represent the flow of financial or technical support; thick solid lines represent the flow of feedback and information; broken lines represent outputs/products.

and land conflict; (2) document, aggregate, and communicate inputs from grassroots organizations for the design and implementation of provincial and national agricultural plans and programs and advocate actions to address their concerns and constraints; (3) coach, train, and strengthen farmers' associations; (4) act as brokers, bridges, or platforms for providing knowledge, advice, and innovative sharing among farmers; (5) inventory, coordinate, monitor, and evaluate agricultural development projects and activities; and (6) support farmer organizations in designing proposals and programs. Such CARG activities are thus more diverse and encompassing compared with other platforms and panels.

Ragasa, Badibanga, and Ulimwengu (2016) evaluate the effectiveness of 55 local-level Agricultural and Rural Management Councils (CARGs) in 23

randomly selected territories in the western DRC. All CARGs (territory, sector, city, or group) in the target territories were included in the sample. A full listing of the CARG leaders and members (stratified by government and nongovernment) were obtained and selected randomly to participate in the group interviews: three from leadership, one member from the government strata and two members from the nongovernment strata. Face-to-face group interviews lasted between two and three hours.

Ragasa, Badibanga, and Ulimwengu (2016) measure CARG performance using three indicators:

- The first measure of CARGs' performance is how consistent activities and outcomes are with reported objectives, which is a proxy for tangible output or outcome from the multistakeholder platform process. This is important because key informants and some members highlighted the fact that CARGs tend to pursue objectives other than their goals. The study results show that that only half of the surveyed CARGs achieved results consistent with at least one of their main goals, while the rest have not achieved any tangible outputs consistent with their objectives. Here, we see a mismatch between the goals and actual activities among many CARGs, which is a cause for concern as it signals a lack of focus.

- The second set of performance measures is related to the satisfaction and perception of relevant stakeholders (in this case, extension organization heads, agricultural workers, and members of rural producer organizations) about CARGs. Results show that although 79 percent of the heads of extension organizations were aware of the presence of CARGs, 42 percent of agricultural workers and 49 percent of rural producer organizations (RPOs) were not aware of CARGs. This shows limited outreach and sensitization about CARGs among key stakeholders. Although the majority of stakeholders interviewed were aware of CARGs, only 33 percent attended CARG meetings and perceived CARGs to be useful; and only 11 percent reported having benefited or knowing someone who had benefited from CARGs.

- The third set of performance indicators was the number of times CARGs interacted with service providers and other organizations and institutions; and we also used the CARG members' ratings of these meetings as a measure of the quality of the interactions. Since CARG is a conduit for finding solutions and services for rural communities, it is crucial to measure how they are performing in terms of their linkages and interaction

with other institutions. External partners included MINAGRI, churches, NGOs, donors, farmers' organizations, other CARGs and research institutes and universities. All CARGs reported interaction with at least one of these external partners. CARGs met more often with RPOs, churches, and NGOs (average of five meetings per year); fewer with MINAGRI and donors (average of two meetings per year), and many fewer with other CARGs and research institutes and universities (average of one meeting per year). On average, 15 percent of CARGs found their meetings with external partners "very satisfactory," 70 percent "satisfactory," and 15 percent "not satisfactory." Meetings evaluated as "not satisfactory" were due to the lack of follow-up or limited activities or actions arising from the meetings.

Ragasa, Badibanga, and Ulimwengu (2016) show that CARGs' functioning and performance are diverse and have looked at factors that can help explain CARG performance level using probit regression analysis. The specific characteristics of CARGs that were strongly correlated with CARG performance are as follows: (1) effective coordination of CARG processes; (2) financial capacity; and (3) training received.

Coordination time (a proxy for the commitment of CARG leadership to CARGs) is correlated with CARGs performance. The leaders of the better performing CARGs devoted three times more to CARG activities than those in other CARGs. A substantial amount of time was allocated to the coordination of CARG activities by some CARG leaders, with 39 percent of CARGs in this group allocating between 100 and 286 hours to the coordination of CARG activities. Ways to incentivize CARG leaders to devote more time to management and activities could be part of the discussions on strategies to support CARGs. Borrowing from the literature on incentivizing public-sector service providers (see Musopole et al. 2013), opportunities for training and learning, reimbursement for CARG-related activities spent by CARG leaders, offering free bags of seeds of improved varieties, or vouchers for extension services are some of the incentives for CARG leadership that could be tested. Similarly, borrowing from the literature on IPs (Schut et al. 2016; Faysse 2006; Moellenkamp et al. 2010), investing in an effective broker or facilitator, either from the CARG leadership or an external expert, has worked in many cases to enhance commitment and management of the platform processes.

The financial capacity of CARGs is correlated with better performance. This is consistent with Sanyang et al. (2016), who found that incentives and access to resources are of high importance in the functioning of innovation platforms. A common element in all the successful platforms reviewed above

is that they were funded and supported, which the regression analysis seems to support. The regression analysis provides an indication of strong correlation between training provided to CARG leadership and/or membership and CARG performance. All the platforms indicated training of its membership and executive committees. Areas for capacity strengthening that were implemented in the platforms are facilitation, conflict resolution, negotiation, organization, and management. Most of the platforms reviewed have supporting technical committees in addition to the executive committees that CARGs could also adopt. In addition to the membership and leadership committees, it may be worthwhile to facilitate the creation of innovation clusters (those with similar interests and working on the same value chains) to address specific issues in the priority value chains to encourage stronger market orientation and foster greater economic incentives for participation.

Overall, study results identify several problems and challenges in CARG implementation and the overall weaknesses in CARG formation. When it comes to their role in extension services, there is much controversy in terms of what they can do in extension services, which is partly explained by the lack of a clear definition of the CARGs' mission. While some stakeholders in the agricultural sector believe CARGs can handle any issue relating to agricultural strategies and policies, others do not see how a multistakeholder platform such as the CARG can deal efficiently with an issue that requires resource commitment and regular management operations, such as the provision of agricultural extension services. CARG can play a role as facilitator of access to agricultural extension services and as a platform for demand articulation and aggregation. It appears that CARGs are showing potential as an effective demand-side strategy and a bridging institution for demand and supply. However, they cannot play the role of service provider and therefore cannot function as a supply-side strategy.

To operate effectively as a service provider, an extension organization needs (1) to design and implement a coherent agricultural extension program with clearly defined targets; (2) to use different means and methods for providing agricultural extension services; (3) to use well-trained and experienced extension personnel; and (4) to have substantial financial and material resources to complete its goals. The CARGs do not meet these conditions. In fact, a CARG is a multistakeholder platform for consultation and thus differs from any permanent structure or organization that can design a program and commit the resources needed to implement it. Supply-side strategies, including capacity building and training of pluralistic extension service providers, will be crucial to complement investments and support to demand-side strategies such as CARGs.

Integrated Agricultural Research for Development and Innovation Platforms

The Lake Kivu region, capturing parts of eastern DRC, Rwanda, and Uganda, is one of three project sites of the Sub-Saharan Africa Challenge Program (SSA-CP), coordinated by the Forum for Agricultural Research in Africa (FARA). SSA-CP aims to develop technologies for sustainably intensifying subsistence-oriented farming systems; develop smallholder production systems that are compatible with sound natural resource management; improve the accessibility and efficiency of markets for smallholder and pastoral products; and catalyze the formulation and adoption of policies that would encourage innovation to improve the livelihoods of smallholders and pastoralists. It started in 2004 with the aim of introducing a new approach to promoting innovation and diffusion of innovations in African agriculture.

Integrated Agricultural Research for Development (IAR4D) is based on the innovation systems perspective and creates coalitions of stakeholders to identify and address local bottlenecks to agricultural development. Through this approach the program aims to promote agricultural innovations by using farmers' indigenous knowledge through a participatory framework and interactions between different stakeholders. The innovation systems perspective focuses on recognition of a wider, differentiated set of innovation suppliers; demands responsiveness and better connectivity of agricultural research with a wider range of innovation actors beyond extension agents and farmers; and expands the definition of the innovations being developed to include both economic and social applications (World Bank 2007, 2012).

A central concept of this approach is innovation platforms (IPs), which are decentralized local innovation systems. IPs are vehicles to bring stakeholders together. Each IP serves a group of villages and theoretically chooses representatives from different stakeholders via a participatory process. These representatives of farmers' associations, traders, researchers, extension workers, NGOs, and government policymakers regularly meet at the platforms, articulate their views and negotiate joint strategies for action. To provide proof of concept, the IAR4D program and its IPs were rolled out as a large experiment whereby some communities received IPs and others did not. In addition, baseline and midline surveys were conducted. These processes ensure rigorous monitoring and evaluation of the concept.

Available studies show mixed outcomes of these IPs (Pamuk, Bulte, and Adekunle 2012, 2014). Even within eastern DRC, results are mixed. The IPs in Kituva resulted in higher food security and reduced poverty, while those in

Rubare led to lower food security and a higher poverty count. There were no significant impacts of IPs on poverty in Bweremana and Rumangabo (Pamuk, Bulte, and Adekunle 2012). The mixed outcomes of IPs in the context of the IAR4D program and SSA-CP are consistent with results obtained by other authors in other contexts (Kilelu, Klerkx, and Leeuwix 2013; van Paassen et al. 2014). There is limited information on why some IPs were more successful, except that Pamuk, Bulte, and Adekunle (2014) indicated that the level of initial social capital in a village was positively associated with the success of an IP.

Also, the IPs that were implemented for two years or longer had a higher percentage reduction in poverty than those implemented for only one year (Pamuk, Bulte, and Adekunle 2014). The more established IPs on average experienced a 20 percent reduction in poverty compared to an increase of 5 percent for immature IPs. This is consistent with our findings on the performance of CARGs: regression results show that the age of a CARG helps explain its performance. Combining both studies, there seems to be negative startup effects that may capture the investment component of building a functional platform and its short-term (opportunity) costs, and that medium-term benefits seem to materialize after several years of establishment.

Other lessons can also be derived from other IPs in other contexts. For example, Plataformas in Ecuador, which center on alliances among small-scale farmers and a range of service providers to link smallholders to high-value agricultural markets, have been quite successful (Cavatassi et al. 2011). Overall, there has been more success in IPs when the private sector is involved. When economic incentive and market orientation are strong, participation and contribution by the private sector, as well as producers and other actors, become stronger. CARGs can help set up and facilitate innovation clusters and IPs focusing on priority value chains. Sanyang et al. (2016) shows that several or different IPs and innovation clusters can be formed within a value chain, such as on technology, marketing, and policy. This argument is also supported by the multiple barriers in a value chain (technological, institutional, lack of resources, administrative, organizational, opposition, among others) and therefore requires multiple innovation champions described by Klerkx et al. (2013). As in the case of oil palm and cocoa in Ghana and rice in Benin, several innovation champions worked toward actions within each of these value chains: technology champion (for technological barriers); power champion (for institutional barriers, ignorance, oppositions, or lack of resources); process champion (for institutional barriers, administrative, bureaucratic); and network champion (for organizational, cooperation problems).

Extension Services in the Food Production, Processing, and Marketing Project

In 2011, in collaboration with the United States Agency for International Development (USAID), the DRC government launched the Food Production, Processing, and Marketing (FPPM) project—which aimed to raise incomes and improve food security in the target areas by improving agricultural productivity, market efficiency, and the capacity of producers to respond to market signals. Provision of agricultural and market extension services are key interventions under the project. In August–October 2013 and February–March 2014, halfway through the project's implementation, a midline survey of 3,110 consisting of a random selection of project beneficiaries in project sites and a random selection of households in comparable nonproject areas was conducted to assess progress with respect to intermediate outcomes (see Ragasa, Nkonya et al. 2016 for more details on the sampling). The study pays close attention to accurate attribution of observed changes to the project and employs a double-difference method that compares the changes in indicators before the project and at the time of the survey (project midline) between the beneficiaries and comparable control groups.

We highlight the main impacts of the project on extension services. We see some positive impact on participation in farmer field schools in Bandundu province only but not in the other two provinces: 59 percent of farmers in FPPM villages had access to FFS in 2013, up from 49 percent of farmers in 2010, compared with 33 percent of farmers in control villages (Bandundu only). We also see some positive impact of the FPPM project on the access to agricultural extension services in the three provinces: a total of 35 percent to 50 percent of FPPM beneficiaries, while only 15 percent to 30 percent of the control group reported access to extension services in the three provinces in 2013. Positive change from 2010 to 2013 is observed among FPPM beneficiaries, while a decrease in extension services access is reported among the control group.

These changes are statistically different between FPPM beneficiaries and the control group in the three provinces. However, we see less impact on market extension: the FPPM intervention did facilitate increased access to market information in Bandundu but had no significant effect in Kinshasa and Bas-Congo. While we see some changes in access to extension services, we do not see positive impacts on access and use of productivity-enhancing inputs and improved technologies being promoted by the project. We see minimal improvement in productivity in Bandundu, but no significant impact on the change in productivity is observed in the other two provinces.

Overall, the survey results suggest weak impact on most of the outcome indicators, and they highlight challenges in implementing small-scale farmers' capacity building within the context of weak institutions and a fragile political context. Given the long-term nature of the FPPM objectives of increasing crop productivity, market efficiency, and farmers' capacity to respond to market signals, we did not expect that significant impacts of the FPPM intervention would be evident in the early stages of the project's implementation. However, weak impacts at midline show challenges in the implementation and some areas that need improvements and focus.

One implication is the need for complementary investments on the supply, accessibility, and affordability of inputs and technologies for the training and extension services to show impacts. For instance, a major focus of the project is on seed multiplication and distribution as reflected in the bulk of activities during the first two to three years of its implementation. However, there seems to be weak impact to date, with only a modest increase in adoption of improved varieties of maize in Bandundu and beans in Bas-Congo and no impact in the other focus province or on the other focus crops. The project has run into problems related to the foundation seed purchase and certified seed production and multiplication components in the earlier years of implementation. To fix this, efforts should focus on better selection and enforcement of contracts among seed multipliers and stricter monitoring of services and seed quality. Traders, extension agents, and farmers interviewed expressed the need for more certified seeds to be distributed.

A second implication is the need to approach the issues and investments within a value-chain perspective and focusing investments on developing different aspects of the value chain. To improve market efficiency, our findings suggest the necessity of intensive investment in developing collective marketing by linking producers and traders. Building partnerships with transporters, exploring different transport schemes, and rehabilitating aggregation centers to reduce transport costs and better support the marketing activities of local producers, traders, and consumers will also improve market efficiency substantially. There is a need to intensify activities geared toward setting up the village savings and loan cooperatives and linking farmers with formal credit institutions. More training activities on business management skills development are also needed.

Integrated Multipronged Communication Approaches

Eastern DRC is one of the project areas for the Consortium for Improving Agriculture-Based Livelihoods in Central Africa (CIALCA), a research-for-

development consortium led by the Tropical Soil Biology and Fertility Research Area of the International Center for Tropical Agriculture (TSBF-CIAT), the International Institute of Tropical Agriculture (IITA) and Bioversity International. It aims to improve the livelihoods of rural households in Central Africa through the identification, evaluation, and promotion of technological options to enhance the productivity of banana-, maize-, cassava- and legume-based systems and to create an enabling environment for their adoption. CIALCA promoted complete integrated soil fertility management (ISFM) comprising the use of improved germplasm, mineral fertilizer, appropriate organic resource management, and local adaptation.

Vanlauwe et al. (2012) describe CIALCA as an integrated, multipronged communication approach using a mix of tools to disseminate and promote ISFM at a large scale. The first steps toward ISFM were fertilizer and improved varieties. An essential condition for their adoption is access to farm inputs, markets, and financial resources. CIALCA has worked on dissemination strategies, including ways to facilitate access to the required inputs, simple information fliers spread through extension networks, and knowledge on how to avoid less responsive soils. CIALCA implemented campaigns that addressed farmers' constraints by offering them information, technology demonstrations, product exhibits, financial incentives, and opportunities to develop their skills within their own farms.

As efforts to promote the seed and fertilizer strategy were under way, activities such as FFSs were initiated to guide farming communities toward complete ISFM. The CIALCA Knowledge Resource Centre was established in the African Great Lakes region to identify and leverage new impact pathways for ISFM technologies. By working closely with extension agents and outreach partners, targeted information tools can be developed to support adoption of practices by farmers in specific settings.

According to Vanlauwe et al. (2012), a particular challenge was to develop innovative knowledge products that take into account the low rates of adult literacy and formal education prevalent in the region. Rural radio, one tool that was used, offered a wide reach and was very useful for raising awareness around a particular issue. However, it is less suitable as a training tool, particularly as knowledge complexity increases. With increasing complexity of knowledge, CIALCA focuses on rigorous and in-depth farmer facilitation and training. CIALCA has intervened in markets by working with farmers' organizations to achieve a marketable production scale. Capacity building on collaborative action, marketing and business planning skills, and management of credit and finances have ensured that farmers are now able to bulk their

produce, wait for better prices, and earn higher incomes from their produce. In addition to farmers, training also targets the institutions and organizations that support farmers' organizations, such as NGOs and national research staff, to ensure postproject sustainability.

Based on Vanlauwe et al. (2012), farmers in South Kivu were able to raise their sales revenues by 50 percent through strategic storage facilitated by inventory credit schemes (*warrantage*): farmers did not have to sell immediately after harvest but were able to store their produce collectively, awaiting better prices for their products. Through group efforts, farmers were able to acquire credit for their ISFM-based farming activities and, because they had targeted production to key markets, were able for the first time to borrow funds without collateral. In addition, farmers working in groups have been able to initiate mutual savings schemes that supplement other sources of finance, particularly for investment in new technologies.

8.7 Conclusion

As pointed out earlier in the chapter, 10 percent of the country 2013–2020 NAIP under CAADP is allocated to agricultural research and extension. However, per the recent review by the DREA (AU-DREA 2017), the country is not on track to achieving the CAADP/Malabo commitments. This means that the ambitious strategy adopted by the government of the DRC, as part of the NAIP, is still very much relevant. This serves as basis for more concerted efforts to rebuild the agriculture sector and provide the needed extension and other services to the rural population. Rebuilding the agriculture sector is crucial for food security, restoring livelihoods, and economic recovery of the Democratic Republic of the Congo, as well as revitalizing the extension system, which will be extremely important for rebuilding the agriculture sector. Strategies to rebuild the agricultural extension service in the DRC must look at both demand-side and supply-side constraints and should follow a defined sequence.

This chapter highlights four lessons. First, it highlights that public-sector extension remains crucial even in areas with very weak government institutions and fragile states like the DRC. As widely observed in the DRC and other fragile countries, many donor and NGO-led projects tend to bypass and not involve government institutions in their project design, implementation, and capacity-strengthening activities. An important strategy therefore is to include public-sector extension agents and subject matter specialists in capacity-strengthening and learning programs instead of focusing only on

NGOs. It is crucial to work with the government counterparts (agriculture ministry, extension system, research institute, and seed inspection systems) and not bypass them in agricultural and rural projects. Even when there is some distrust and perceived inefficiency in the government institutions, they continue to have the cadre of human resources scattered throughout the country and have long-term structures, as compared to the limited coverage and more ad hoc nature of NGO activities, therefore they should be a crucial part of any capacity-strengthening and extension activities.

Second, in the case of a pluralistic system, focusing on coordination, quality control, and regulation to avoid conflicting extension messages and duplication of efforts will be a priority role for the government and this would be equally or even more important than providing extension services themselves. Although there remains pressure to continue service provision by the public sector, there has to be major decisions on how to invest limited resources more effectively. The public sector could focus more on coordination and regulation of extension services and freeing more resources from the actual service provision, which could be done mainly by, or contracted out to, the private sector and nongovernmental organizations.

Third, given the greater knowledge brokering and facilitation role of extension, linkages and partnerships become extremely crucial for performance. As shown in this chapter, there are many constraints to linkages, and therefore part of the strategy is to find ways to help extension agents and organizations link more to each other and to other relevant actors. This chapter has shown that providing means of transportation and reducing the time and transaction costs for extension agents to go to the field and visit farmers and to interact with other actors are some of the ways to encourage greater interactions and linkages.

Lastly, this chapter complements findings by Davis et al. (2010) and Ragasa et al. (2013) on Ethiopia that number or quantity of agents is not a sufficient measure of performance, but an effective system needs to focus on building quality of agents and enabling environment for them to be motivated to work as mandated. Enabling conditions that are found to be significant are external funding, enforcement of performance targets, systems of rewards and sanctions, and skills development and training. In measuring performance, it is important not to focus only on the number of staff and getting a good ratio of extension agents to farmers, but more important, it is key to look at systems in the organizations to ensure that performance targets are set and being followed, that there are right incentives based on the performance, and funding, skills sets, and mobility are present for the agents to perform their tasks.

In terms of priority action areas, this chapter proposes the following: First, the enabling environment for extension services is a priority. In particular, improving input and output market efficiency and increasing access to credit, inputs, markets, land, and equipment/tools are the most common and most consistently mentioned constraints among farmers, based on the perspectives of extension agents, extension organization heads, and farmers themselves. Increasing the productivity and incomes of the rural community does not require changes in the extension system alone; rather, a holistic approach is essential to address constraints in the input distribution system and technology adoption. The results warrant complementary review and reform in the policies and investments governing these inputs and services.

Second, within the extension system, governance issues need to be addressed, including clarity in policy and strategy, coordination, government commitment, and funding. Lack of clear direction and vision, coupled with measurable targets, are the weakest points of the DRC extension system. In the most immediate term, the priority is to have a unified policy and clearer strategy for extension services in the country. This requires designing and communicating a clear mission and mandate to more than 11,000 and more extension agents scattered throughout the country. With clear mandate, functions, and performance targets of extension services staff, it may trigger the change in perception and trust among farmers that extension agents are no longer "monitors" but knowledge brokers and technical advisers. The national workshop on agricultural extension and productivity held in June 2012 offered a good start, and the government can continue to bring the workshop's recommendations into its agricultural strategy planning and policy formulation.

Moreover, institutional coordination, quality control, and regulation of extension services should be strengthened. Greater coordination, quality control, and regulation are critical to communicate consistent extension messages across many different extension service providers. This involves encouraging development organizations to work with local MINAGRI offices, INERA, SENASEM, and SNV, to avoid inconsistencies and duplication of efforts, as well as to ensure capacity building and continuity of activities. The capacity of SNV to play its role of coordination and technical backstopping should be strengthened. There is a need to mobilize substantive funds and commitment from the government and its partners. As discussed above, the government often defaults on its commitments in the implementation of key policies and programs. No amount and degree of institutional reforms or approaches will work without sustained funding, especially from the government. The

National Agricultural Investment Plan, developed in 2013, details a series of reforms on the extension system for the coming years. This initiative is encouraging and deserves bold and firm commitment from the government and its partners.

Third, management systems, especially incentive systems based on a credible performance M&E system, need to be strengthened at the organizational level. The enforcement of an incentive system (reward or sanction) based on performance is currently very weak with only a few extension organizations having systems of reward for good performance and sanctions for nonperformance. It does not really matter whether extension organizations or agents do good or bad. Moreover, performance indicators and targets are often not set and enforced in most organizations; and for those few that have these targets, they stop at the level of input or output and almost none monitors on the level of outcomes and impacts (yield, income, or nutrition improvements).

Fourth, human as well as physical capacity need to be strengthened. Priority lies on the streamlining of the number of extension services staff by retiring the older agents to hire and retrain younger and more dynamic ones. This could remake the salary structure and free valuable resources that can be shifted to much needed operating and capital components. The plan has already been started and the government can facilitate its implementation for quicker impacts.

Fifth, there is need to address the demand side to strengthen the role of farmers' organizations at the village level, and the role of CARGs at the sector and territory levels, in demand articulation and the capacity for planning and monitoring service provision. The role of CARGs in the policymaking process should be strengthened so that they can advocate effectively for greater investment and commitment to agricultural extension.

Last, in the medium term, complementary investment in reforming the agricultural education and training institutes will be a priority as they are the critical institutions that train and nurture the new wave of agricultural extension agents and officers. This includes a review and reform of extension curriculum. And, given the serious food and nutrition insecurity in the Democratic Republic of the Congo, inclusion of nutrition messages in agricultural extension services is an important strategy. The scarcity of female extension workers requires investing in and supporting girls' education and mobilizing more female agents. Given that extension services are just one of the factors determining productivity growth, complementary investments and policy reforms to facilitate access to markets, and affordability of inputs to complement the knowledge and extension provision, are also important strategies.

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