

Review paper

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AGRICULTURE EXTENSION AND ADVISORY SERVICES IN BURKINA FASO AND NIGER

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ABSTRACT

Agriculture still plays an important socio-economic role in Burkina Faso and Niger. However, the agriculture sector faces several difficulties and both countries still suffer from food insecurity and malnutrition. Therefore, there is an urgent need to develop the agricultural sector. Extension and advisory services are widely recognised as an essential instrument for agriculture development. Therefore, the present review analyses the state of research on extension and advisory services in Burkina Faso and Niger. It draws upon a search performed in June 2021 on the Web of Science. The analysis of the scholarly literature suggests a gap in the research field. The modernisation of the extension system implied the co-existence of different extension approaches, from the public training and visit (T&V) extension program to various participatory advisory approaches such as Farmer Field Schools (FFS), with different levels of involvement of the private sector and NGOs. Modern advisory services stress the centrality of farmers' participation and experiential and social learning. A prominent feature of modern advisory services is their focus on innovation development rather than the linear transfer of knowledge and technologies. The modernisation of extension services has implied an increase in ICT use. Proposals to improve advisory services performance include building extension staff's capacity, increasing funding, creating an enabling institutional environment and fostering farmers' participation. Strengthening the extension system is essential to foster the sustainable development of agriculture in Burkina Faso and Niger in the face of climate change, which, in turn, is vital to achieving sustainable food and nutrition security.

Keywords: *agriculture, rural development, extension services, training & visit, farmer field school, West Africa.*

INTRODUCTION

Burkina Faso (BF) and Niger are two developing, landlocked countries in Sahelian West Africa. Agriculture still plays an important socio-economic role in both countries. Recent data from the World Bank show that agriculture, forestry and fishing contribute to 20.2% of the gross domestic product (GDP) in Burkina Faso and 37.8% in Niger, while employment in agriculture is at 73% in Niger and 26% in BF. Furthermore, 83% of the population in Niger and 70% in BF lives in rural areas (World Bank, 2021). While agriculture is still central in the livelihoods of rural populations in both countries, it is generally extensive, poorly mechanized and almost entirely reliant on the variable summer rainfall, making it vulnerable to climate change (USAID, 2017). Agriculture is also important for the food security of the population. However, according to the State of Food Security and Nutrition in the World 2020 (FAO et al., 2020), the prevalence of undernourishment in the total population is still high in BF at 19.2% over 2017–19, while it is even worse when considering the prevalence of moderate or severe food insecurity in the total population, which was at 47.7% over the same period. Challenges relating to rural livelihoods and food security show the urgent need to develop the agricultural sector in both countries.

Extension and advisory services are widely recognised as essential for agriculture development (Cook et al., 2021). According to Leeuwis and van den Ban (2004), *“Extension [is] a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations”*. The public extension system has been the most common source of information for farmers in developing countries (Eicher, 2007). Nevertheless, there is a widespread concern that the public extension system is underperforming (Cook et al., 2021; FAO et al., 2017). This has led to the promotion of farmer-driven extension systems. Indeed, to improve the efficiency of extension services, most developing countries have attempted to move from supply-driven, public extension to demand-driven, pluralistic advisory services but results have been rather mixed (Cook et al., 2021; Meena & Singh, 2013). Mapiye et al. (2021) show that different extension approaches co-exist nowadays viz. technology transfer-based extension (e.g. ministry-based or public extension, training and visit extension), commodity specialized extension approach, participatory agricultural extension approaches (e.g. farmer field school, project extension, farming systems research–extension), cost-sharing extension approach, and education institution extension approach. Also in West Africa, advisory services are increasingly considered as a promising alternative to the Training and Visit extension system (Moumouni et al., 2011). The impacts of the reform and restructuring of public extension services on their performance and plurality change from a country to another. In this context, the present review analyses the state of research on extension and advisory services in Burkina Faso and Niger.

MATERIALS AND METHODS

The paper draws upon a systematic review of all documents indexed in the Web of Science (WoS) and follows the PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Moher et al., 2009). A search was performed on 11 June 2021 using the following Title-Abs-Key search query: (*extension OR advisory OR advice*) AND (*agriculture OR agricultural OR farming OR farmer OR crop OR animal OR fish*) AND (*Burkina OR Niger OR "West* Africa" OR Sahel*). The initial search on WoS yielded 288 documents. The selection of the documents to be included in the systematic review was informed by the methodology suggested by El Bilali (2021). Table 1 describes the selection steps and process. Particularly, three inclusion/eligibility criteria were considered: geographical coverage (viz. the document deals with Burkina Faso, Niger or broader West Africa/Sahel); thematic focus (viz. the document deals with extension and advisory services in agriculture and/or rural areas); and document type (viz. only research articles, chapters or conference papers were selected; editorial materials – letters to editors, commentaries and/or notes – as well as reviews were discarded).

Table 1. Articles selection process.

Selection steps	Number of selected documents	Number of documents excluded and exclusion reasons
Search on WoS	288	--
Screening of documents based on titles	288	107 documents excluded because they deal with other countries than Burkina Faso and/or Niger e.g. Bangladesh, Benin, Brazil, Cameroon, Gabon, Gambia, Ghana, Guinea, India, Indonesia, Ivory Coast, Kenya, Mali, Mauritania, Morocco, Nepal, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Togo, Uganda and USA
Screening of documents based on abstracts	181	157 documents excluded: <ul style="list-style-type: none"> • 32 documents that do not deal with Burkina Faso and/or Niger • 8 documents that do not deal with agriculture • 117 documents that do not address extension and advisory services
Scrutiny of full-texts	24	5 documents excluded: <ul style="list-style-type: none"> • 2 documents that do not deal with Burkina Faso and/or Niger • 1 document that does not address extension and advisory services • 2 reviews

Selection steps	Number of selected documents	Number of documents excluded and exclusion reasons
Inclusion of documents in the systematic review	19	--

Following the screening of titles, 107 documents were excluded as they do not refer to Burkina Faso and/or Niger; these mainly refer to other West African and/or Sahelian countries (especially Nigeria). At this step, documents covering wider geographical areas (e.g. West Africa, Sahel, Sub-Saharan Africa) or those where the geographical scope is not specified in the title were kept for further analysis. Further 157 documents were excluded following the scrutiny of abstracts mainly because they do not address extension and advisory services. Additionally, 5 documents were discarded following the analysis of full-texts, including 2 reviews (Hansen et al., 2019; Nkiaka et al., 2019). Consequently, only 19 documents resulted eligible and were included in the systematic review (Table 2).

Table 2. List of the eligible articles.

Publication year	References
2021*	Bakker et al. (2021)
2020	Zossou et al. (2020); Bacci et al. (2020)
2019	Sylla et al. (2019)
2018	Boafo et al. (2018); Siddo et al. (2018); Faure et al. (2018); Maredia et al. (2018)
2015	Ihm et al. (2015)
2011	Faure et al. (2011); Le Gal et al. (2011); van Paassen et al. (2011); Settle and Garba (2011)
2005	Riise et al. (2005)
1999	Evenson and Siegel (1999)
1997	Bindlish and Evenson (1997)
1994	Okali et al. (1994)
1993	Shapiro et al. (1993)
1992	Schaefer (1992)

* As of 11 June 2021.

RESULTS AND DISCUSSION

The low number of the selected articles suggests a gap in research on extension and advisory services in BF and Niger. This is particularly true in Niger as most of the

selected documents deal with BF. The majority of the selected articles address extension services for crop production while animal production is generally overlooked. Among crops, there is more attention to commercial ones such as cotton (Boafo et al., 2018; Settle & Garba, 2011) and rice (Zossou et al., 2020). However, some papers address general and transversal extension services such as those relating to meteorological information (Bacci et al., 2020).

Different extension approaches coexist in Burkina Faso and Niger. The Training and Visit (T&V) system (Bindlish & Evenson, 1997; Evenson & Siegel, 1999) has been the dominant agricultural extension program in developing countries for decades. Despite recurring criticisms of the T&V system, data from Kenya and Burkina Faso suggest that it helped to support agricultural growth, increase productivity and close the yield gap. However, evidence shows that T&V management affects the effectiveness of the extension services and the development of the agricultural sector (Bindlish & Evenson, 1997). There is an ongoing, yet slow, transition from T&V to advice for family farms. In the latter are included various advisory approaches such as Farmer Field Schools (FFS) (Bakker et al., 2021; Settle & Garba, 2011) and Management Advice for Family Farms (MAAF) (Faure et al., 2018). The results of the reform of the public agricultural services have been mixed and change from a country to another. In their analysis of the perceptions of the stakeholders about the outcomes of the reforms of the cotton sector in Ghana and Burkina Faso, Boafo et al. (2018) found that the assessment of Ghanaian stakeholders generally highlighted only negative outcomes (e.g. lack of farmer's voice in extension services, corrupt field agents of private companies, conflicting extension policies of cotton companies), while Burkinabe ones perceived both negative (e.g. side aging extension agents) and positive (e.g. regular training and support services, development of better-quality extension services) outcomes.

Community-based and participatory extension approaches have become increasingly prominent in developing countries as a consequence of the decline of investments by governments in public extension services in the 1980s–1990s period as a result of the Structural Adjustment Programs (SAPs) promoted by the World Bank and International Monetary Fund (IMF). In this respect, Faure et al. (2011) stress the need for continuous adaptation of the methods of extension and advice taking into consideration the local context as well as resources (financial, human) available for providing advisory services. This also implies a better understanding of the drivers of knowledge acquisition, learning and technology adoption in agriculture and rural areas (Shapiro et al., 1993; Zossou et al., 2020) in order to use it in the design of effective extension and advisory programs. Zossou et al. (2020) show that a range of factors affects farmers' knowledge such as household size, training, access to knowledge sources and socioeconomic status. They also stressed the central role of the experiences of farmers themselves or that of fellow ones in the adoption of new technologies (Zossou et al., 2020). Therefore, effective extension programs should promote both first-order (experiential) learning and second-order (social) learning (van Paassen et al., 2011).

The modernisation of extension services has implied an increase in the use of information and communication technologies (ICT) (Ihm et al., 2015; Maredia et al., 2018). This has determined a change in the communication media used by extension staff to convey extension messages to the farmers. In this respect, Maredia et al. (2018) found that animated videos shown on mobile phones, a versatile and economical method, were as effective as the traditional extension method (i.e. live demonstration) in Burkina Faso. Animated videos were also effective in inducing the adoption of innovative technologies by Burkinabe farmers but less effective than live demonstration (Maredia et al., 2018). However, Ihm et al. (2015) argue that the use of Information and communication technologies for development (ICT4D) should take into consideration the different media environments and preferences of target populations within countries. This encompasses the digital divides within countries and target population preferences as well as the disparities among extension agents and farmers in media ownership, access and ICT skills.

The governance mechanisms to steer the advisory services affect not only the content of the advice but also the overall performance of the advisory services (Faure et al., 2011). Governance is often linked to the funding of extension and advisory services. Indeed, Faure et al. (2011) argue that “*the funding mechanisms are pivotal in defining the rules of governance*” (p. 364). Nowadays, extension and advisory services are no more only public and there is a growing participation of the private sector (Sylla et al., 2019) and NGOs (Evenson & Siegel, 1999). Interestingly, Sylla et al. (2019), in their analysis of the perceptions of Burkinabe farmers about the quality of public and private agricultural extension, found that farmers were satisfied with the quality of both types of providers of extension services (e.g. facilitating market access, technical support, facilitating access to credit, facilitating input provision), but private advisory services were rated better. This finding supports the privatisation of extension services.

A prominent feature of modern advisory services is their focus on innovation development rather than the linear transfer of knowledge and technologies (Bakker et al., 2021). In this context, the literature describes different attempts to involve farmers in the co-design of advice content and tools (Le Gal et al., 2011). Bakker et al. (2021) show that even when it comes to participatory methods such as FFS their effect on farmers’ innovation and change processes depends on the level of their participation. Indeed, the authors suggest that the innovation of farmers in pest management (e.g. use of bio-pesticides), organic and mineral fertilization (e.g. use of compost) and legume cropping practices (e.g. intercropping, rotation) in Burkina Faso and Togo was much better when farmers’ participation in FFS was collaborative (i.e. they participated actively in developing the FFS curricula and structure) than when merely consultative (i.e. farmers have low, limited participation in developing the FFS curricula and structure) (Bakker et al., 2021). This clearly shows that no matter how the advisory approach is named, the real system performance depends on how it is implemented at the community, local level. Meanwhile, Zossou et al. (2020) argue that the “*key policies for*

strengthening the innovation systems are those that help farmers access both formal and informal knowledge sources, credit services, better welfare and information and communication tools” (p. 291).

Gender issues are generally overlooked in studies on extension and advisory services in BF and Niger, with a few exceptions. For instance, Evenson and Siegel (1999) analyse the effects of government (Training and Visit) and non-government (NGO) extension programs on the role of women as farm managers in Burkina Faso. They concluded that women’s access to extension services strengthens their involvement in the management of farms and has a positive impact on crop yields. Scholars made several proposals to improve the performance of extension and advisory services in BF and Niger. These include building the capacity of extension staff (Bakker et al., 2021; Faure et al., 2011, 2018), increasing and better targeting financing (Faure et al., 2011, 2018), reinforcing collaboration between different stakeholders (Faure et al., 2011) as well as fostering farmers’ participation in the design and implementation of extension programs (Bakker et al., 2021; Faure et al., 2018; Okali et al., 1994; van Paassen et al., 2011). Faure et al. (2011) suggest that the functioning and performance of advisory services in Burkina Faso and Benin are affected by *“the financing mechanisms, the governance mechanisms put in place, the quality of the human resources delivering advice, and the characteristics of the advisory method”* (p. 364). This clearly shows the central role of human resources in determining the performance of extension and advisory services. Indeed, the authors posit that *“the nature and the quality of advisory activities are closely related to the skills of advisors and managers of advisory services”* (p. 364) (Faure et al., 2011). As for the private advisory services, creating an enabling business environment seems crucial. Referring to BF, Sylla et al. (2019) put that the *“government can promote private participation in extension delivery by creating a good business environment for the private systems to operate”* (p. 1). Institutional environment also matters in the case of extension services based on adult learning such as Management Advice for Family Farms (MAAF). Faure et al. (2018) found that the main constraint to scaling MAAF is institutional and recommended giving producers’ organisations a greater say in the governance of the advisory system not only to improve its effectiveness but also to reduce operating costs and strengthen its sustainability. A further proposal regards increasing the use of ICTs in the design and delivery of extension services (Ihm et al., 2015; Maredia et al., 2018).

CONCLUSIONS

This article provides a comprehensive review of the state of research on extension and advisory services in BF and Niger. The analysis of the scholarly literature suggests a gap in the research field, especially in Niger. It also suggests that the extension system focuses mainly on crop production while other agriculture sub-sectors (e.g. animal production) as well as rural development are generally overlooked. Different extension approaches coexist in BF and Niger. These include the T&V extension system as well as various advisory approaches such as Farmer

Field Schools (FFS) and Management Advice for Family Farms (MAAF). Nowadays, extension and advisory services are no more only public and there is a growing participation of the private sector and NGOs. The results of the reform of the public agricultural services have been mixed and change from a country to another. Community-based and participatory extension approaches have become increasingly prominent as a consequence of the decline of investments by the government in public extension services. Modern advisory services support continuous adaptation of the methods of extension and advice taking into consideration the local context as well as resources (financial, human) available for providing advisory services. They also stress the central role of the participation of farmers and the importance of experiential and social learning. Extension is a complex, highly dynamic process that cannot be based on generalized science-based knowledge, but should take into account the context-specific knowledge of farmers as well as values and perceptions of the different local stakeholders. A prominent feature of modern advisory services is their focus on innovation development rather than the linear transfer of knowledge and technologies. The modernisation of extension services has implied an increase in the use of ICT. However, the use of ICT should take into consideration the different media environments and preferences of target populations. The governance mechanisms affect not only the content of the advice but also the overall performance of the advisory services; no matter how the advisory approach is named the real system performance depends on how it is governed and implemented. Proposals to improve the performance of extension and advisory services in BF and Niger include building the capacity of the extension staff, increasing funding and improving its targeting, reinforcing collaboration between the different stakeholders in the agricultural knowledge and innovation system (AKIS), creating an enabling institutional environment as well as fostering the participation of farmers in the design and implementation of advisory programs. Moreover, more attention should be paid to gender issues to meet the differentiated needs of women farmers. Building the capacity of the extension staff is essential for fostering the sustainable development of agriculture in BF and Niger in the face of climate change. This, in turn, is vital to achieve sustainable food and nutrition security.

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