

Appraisal of Innovations in Agricultural Extension and Advisory Services in Cameroon

Amungwa FA*

Department of Sociology and Anthropology, Faculty of Social and Management Sciences, University of Buea, Republic of Cameroon

***Corresponding author:** Amungwa FA, Department of Sociology and Anthropology, Faculty of Social and Management Sciences, University of Buea, Republic of Cameroon, Tel: 67 777 353 81, E-mail: dramungwa@yahoo.com

Citation: Amungwa FA (2018) Appraisal of Innovations in Agricultural Extension and Advisory Services in Cameroon. J Adv Plant Sci 1: 204

Article history: Received: 02 August 2018, Accepted: 26 October 2018, Published: 29 October 2018

Abstract

In view of the mounting challenges facing public provision of agricultural extension and advisory services in sub-Saharan Africa, participatory approaches, involving NGOs, the private sector and farmers' associations, have gained increasing importance in recent years as a third way to extension service delivery. This paper highlights the conceptual underpinnings of participatory extension and the challenges inherent in their design and implementation focusing on the impact of the Grass field Participatory and Decentralized Rural Development Project model in Cameroon. Lessons on best practices, future prospects and emerging questions on the new roles of agricultural extension and advisory services are highlighted. The methodology relied on case-oriented data from project evaluations, document analysis, participant observation, and semi-structured interviews. The paper concludes with the view that, for innovative extension approaches to have greater impact on agriculture and rural development, there is a need to identify extension systems that use the potential of the state for appropriate policy support, the private sector, NGOs, farmer associations and community-based organizations to create checks and balances to overcome the failures inherent in past extension models.

Keywords: Innovations in Extension Services; Participatory and Decentralized Approach; Local Development Fund; Social Capital; Cameroon

Introduction

Agriculture is very important to Cameroon's economy as it engages more than 70% of the labour force and contributes over 30% of the Gross Domestic Product (GDP). It provides food for the increasing population and raw materials for agro-based industries. The sector is however faced with several problems which militate against optimizing its growth potential. Some of the constraints include low productivity, poor marketing facilities, and distribution infrastructure, inadequate access to credit, weak extension and advisory services and an inadequate database. Agricultural Extension and Advisory Services imply informing, teaching and advising farmers regarding new and improved technologies and getting a feedback from the farmers to research and implement dealers. This is with a view to helping the farmers improve their productivity, income earning power and standard of living [1]. Extension and Advisory Services are vital to building the capacity of farmers through innovative education and communication approaches, thus, helping them to make informed decisions. Despite the important role of Extension and Advisory Services in the development process, the Cameroonian agricultural extension service faces several challenges, including inadequate funding, poor logistic support for field staff, inadequate training of extension personnel, ineffective agricultural research and extension linkages, insufficient and inappropriate agricultural technologies for farmers, disproportionate number extension agent to farm family ratio and lack of clientele participation in programme development. The challenges faced by Cameroon's agricultural and rural extension are common in the African continent. The expiration of donor funding of the extension component of projects and fierce competition for resources from the national budget among different economic sectors has substantially reduced the availability of funds for agricultural technology delivery [2]. One of the major lessons learned from experience with past extension programmes in Cameroon is that it is not possible for government alone to support extension programmes in all its ramifications. The private sector needs to play a more active role in both funding and the physical transfer of the available improved technologies [3]. In pursuance of more private involvement in agricultural technology delivery, innovative mechanisms are being implemented in a number of extension projects. Innovations in agricultural extension and advisory services provide a framework to engage pluralistic service providers and local stakeholders in strategic decisions on long-term planning of agricultural development programmes. Pluralism, which involves using more than one organization, whether public or non-public, for extension service

delivery, is increasingly adopted as an innovative extension strategy [4-6]. In most developing countries, the farmers-to-extension agent ratio is more than 1,000:1 [7]. Hence, farmers have a hard time exercising demand and holding service providers accountable without some form of organization. Farmers' associations can play a role in aggregating farmers' demands for extension services, representing farmers in participatory models of extension management and helping to finance agricultural extension by collecting fees from their members. If extension is contracted out, they can represent farmers on procurement boards charged with hiring extension service providers. They can also contribute to the evaluation of the performance and impact of agricultural extension services [5]. Farmers are now recognized as active seekers of advice, information and opportunities to learn how to improve their production systems and livelihoods rather than a set of traditional producers who need to be persuaded to adopt innovations [8].

Today's concept of agricultural extension goes beyond technology transfer to facilitation, empowering farmers to work in groups and to scale-up, in dealing with marketing issues, and partnering with service providers. Some extension scholars now employ the phrase, agricultural advisory services, instead of extension, which can imply a top-down approach and ignore multiple sources of knowledge while others talk simply of rural knowledge systems [9-11]. The adoption of innovations in extension and advisory services is informed by the recognition of the importance of agriculture to African economies and the many challenges faced in reducing poverty and enhancing food security. This conviction influenced African governments under the African Union's New Partnership for Africa's Development Agenda, to initiate in 2003, the Comprehensive Africa Agriculture Development Programme (CAADP) to help Africa reach a higher path of economic growth through agriculture-led development [12]. Countries aligning with CAADP have adopted the Maputo Declaration with the objective of: (i) achieving an annual agricultural growth rate of at least 6%, and (ii) allocating at least 10% of the national budget to agricultural development.

The purpose of this paper is to analyze the evolution of agricultural extension practices in Cameroon and to assess the evidence on innovations in agricultural advisory services using the Grassfield Participatory and Decentralized Rural Development Project implemented between 2004 and 2010 in the North West Region. Despite the efforts of governments and International Development Agencies to support and upgrade extension and advisory services, development scholars have generally concluded that the performance of these services in Africa has been disappointing. The Food and Agriculture Organization (FAO), in 2001, characterized extension services across the developing world as failing and in disarray or barely functioning at all [13]. The cost of reaching large numbers of geographically dispersed and largely illiterate smallholder farmers who have limited access to mass media is high in many parts of sub-Saharan Africa. These realities have influenced many agricultural extension scholars to focus attention on assessing the merits and feasibility of innovations in advisory services [5,9,14-17]. Community participation is now considered as a third pillar in the economic system next to the state and the market [17]. Participation is perceived as a particularly important strategy to overcome both the state failures and the market failures in extension [14,17,18]. The top-down approach to development (dominant paradigm) was criticized for its propensity for looking down on local communities [19]. Consequently, the participatory paradigm, a bottom-up approach, was developed as an alternative with the goal to involve local communities in efforts to improve their quality of life. Here, local communities are seen as stakeholders in the process rather than beneficiaries and development initiatives usually focus on their aspirations and strengths [20,21]. When local people participate, they are regarded as agents of change with the ability to transform power and social relations through their own praxis [22,23]. The participatory approach facilitates the transfer of knowledge, not just *from researchers/practitioners* to the locals but also *from locals* to the researchers/practitioners and *between locals* [24-26]. This overcomes what is deemed to be legitimate knowledge being solely derived from privileged experts that has the effect of obscuring other forms of knowing.

Methodology

Data for this paper were obtained from primary and secondary sources including document analysis, the Internet, focused group discussions in the villages that were involved in phase I of the Grassfield Participatory and Decentralized Rural Development Project in Cameroon's North West Region. Case studies give greater depth to assess the extent to which extension project goals and objectives were met [27]. The research strategy sought to generate contextual information on participatory extension and decentralization processes as well as project outcomes. As a first step, seven focus group discussions were conducted in the seven administrative Divisions of the Region with the aim to assess the communities' level of participation and inclusion as well as the level of consensus around shared project goals. Based on the participants' knowledge of project outcomes, forty-two key informants, that is, six from each Division, were sampled purposively from the seven Divisions to participate in group discussions. Field notes were kept from March 2009 to January 2010 on the main issues raised in discussions and observations of on-going project activities. The methodology relied also on project monitoring and evaluation reports and related documents to assess the level of change in the targeted project components.

Evolution of Agricultural Extension and Advisory Services in Cameroon

The development of agricultural extension systems in Cameroon can be classified into a general sequence of five periods: i) *Pre-colonial agriculture* was oriented purely towards subsistence and barter when the need for exchange of commodities between different groups of producers arose; ii) *Colonial agriculture* involved the establishment of experimental stations in Cameroon by European powers with a focus on the production of export crops such as coffee, cocoa and cotton grown by smallholders who were provided advisory services to ensure improved quality and output. Crops such as rubber, banana, tea, oil palms and sugarcane, were grown in large-scale plantations. Assistance to small farmers who grew subsistence crops did not exist, except perhaps in

times of crisis. In the 1950s agricultural extension programmes were established based on the recommended technology packages; iii) After independence of French Cameroon in 1960, *diverse top-down commodity-based extension services* emerged from the remnants of the colonial system, with production targets established as part of five-year development plans and various smallholder development schemes were initiated with support from foreign donors; iv) In the 1970s and 1980s, new hybrids and genotypes were introduced across agro-ecological zones in an attempt to remove farm-level constraints and increase production through widespread adoption of extension packages developed by the agricultural research institution [28]. The environmental and socio-economic repercussions of this decade, known as the green revolution, brought the need for increased farmer participation to the forefront of extension discussions starting in the mid-1980s. Farming Systems Research and Extension contributed to widespread understanding that farming systems are complex and the farmers' role is vital to the adoption of innovations [28]. While paradigm shifts, particularly those involving changes in underlying values come slowly; experiences in agricultural extension service delivery have demonstrated that traditional approaches will need to change rapidly in order to move towards sustainability. During this period, *centralized top-down extension on the Training and Visit model* was introduced in many of sub-Saharan African countries with funding from the World Bank. Existing organizations were merged into a unified national extension service. Agricultural extension messages were delivered to groups of farmers, promoting the adoption of new farming methods and technologies; v) When World Bank funding of the Training and Visit system dwindled around the mid 1990s, diverse bottom-up extension systems funded from various other sources emerged in Cameroon and many sub-Saharan African countries [7]. In the 1990s, extension programmes worldwide recognized that participatory extension facilitates a mutual learning environment and sustainable transfer and adoption of new technologies [3,29,30]. A notable trend in the institutional innovations being experimented in Cameroon is the increased provision of extension services through participatory projects. Some critics have argued that implementation of Structural Adjustment Programmes (SAPs) in Cameroon, has increased rural poverty, provoking a new emphasis on decentralization [31,32]. Decentralization, as an anti-poverty strategy, seeks to shift responsibility for extension planning and decision-making from the centrally-managed, supply-driven and expert-controlled emphasis towards more demand-driven, beneficiary-focused approaches [5,33-36]. This policy incorporates sustainability as a central principle and this requires new ways of motivating collective action and learning, in addition to skills and tools for working with individuals. Teaching has long been the normal mode of transfer of knowledge from one who knows to someone who presumably does not know. Extension for sustainable agriculture emphasizes helping farmers to critically assess their situations and promote local cooperation. A move from a teaching paradigm towards a learning paradigm requires highly participatory interaction and knowledge sharing among all stakeholders. The increasing number of stakeholders in extension makes the issues of coordination and regulation crucial, and underlines the need for the government to remain involved in extension. This includes ensuring food security, regulating food quality and safety, and environmental conservation [37]. Cameroon's Agricultural Extension and Research Programme Support Project financed jointly by Government, IFAD and ADB, implemented nation-wide through competitive research grants sought to improve agricultural yields and productivity as well as farmers' incomes in a sustainable way. To attain the development objectives, the project aimed: (a) to provide support to an integrated, farmer-oriented agricultural extension system; (b) to provide support to a demand-driven agricultural research system; (c) to complete a reform of the Department of Agricultural Production; (d) to assist market-oriented farmers to develop professional associations; and (e) to test alternative methods for delivering agricultural services. While aiming at providing services to all farmers, the project was to give adequate priority to resource-poor and women farmers. The programme had 1,651 extension staff and provided farmers with motorcycles and vehicles to facilitate mobility in field extension with farmer associations (MINADER, 2009). From 1998 until 2004, the World Bank funded the National Agricultural Extension and Research Project (PNVRA) to implement an integrated, farmer-oriented agricultural extension system. The extension strategy was expressed in the Agricultural Development Policy, published in 1995, that facilitated economic liberalization and public-sector withdrawal from direct involvement in production and marketing. The strategy relied essentially on a Training & Visit (T & V) approach, but it included also a principle of flexibility, allowing the national extension system to be opened to substitution of public services by farmer organizations and private service providers. T&V extension is based on classical management principles, including that (1) extension agents should have primary responsibility for carrying out extension functions; (2) extension should be closely linked with research; (3) training should be carried out on a regular and continuous timetable; (4) work should be time-bound; and (5) a field and farmer orientation should be maintained. A recent trend in Cameroon has been the increased channeling of extension services through more commercialized farmer organizations, which tend to be less inclusive of smallholder farmers [33]. The Management Advice for Family Farms (MAFF) strategy, used for identifying new technical and organizational innovations that conform to the needs of farm households has been experimented in the northern regions of Cameroon. While the pilot-test effectively engaged farmers in a process of mutual learning that moved beyond dependency to the linear research-to-extension-to-farmer model, high operation costs and other governance issues have discouraged the widespread use of this approach [33]. The Family Field School (FFS) extension model is being implemented in the cocoa sector for integrated pest management training [38,39]. This approach to delivering information and educational services was designed originally as a means to introduce knowledge of integrated pest management (IPM) to irrigated rice farmers in Asia, but it has since been expanded to numerous countries, covering various agricultural themes [40]. A typical field school educates farmer participants on agro-ecosystems analysis as well as specific technological features of their crops and the field environment. FFS are being used for a variety of activities in sub-Saharan Africa, including food security, animal husbandry, and soil and water conservation. The approach relies on participatory training methods to convey knowledge to participants, with the extension agent-trainer acting not just as a transmitter of information but mainly as a facilitator encouraging farmers' own discovery and discussion of their experiences. A

FFS entails a season-long sequence of half-day sessions of hands-on farmer experimentation and informal training to a selected group of 20–25 farmers during a single crop growing season. The selection of participants is done with strong community involvement through its established leadership and existing social structures. The participants are expected to contribute to the wider community through dissemination of knowledge and follow-up activities such as field experiments and collective actions. The training is led initially by paid trainers or public extension staff. Through group interactions, participants sharpen their decision-making abilities and are empowered by learning leadership, communication, and management skills. Some of the participating farmers may be selected to receive additional training to be qualified as farmer-trainers, who then take up training responsibilities with official backup support such as training materials. Farmers are facilitated to conduct their own research, diagnose and test problems, and come up with solutions. Some studies conclude that there was substantial immediate and developmental impact for participation in Family Field Schools despite their limited opportunities for self-funding [40]. The Farmer's Voice' (La Voix du Paysan) Newspaper produced by the Support Service to Local Development Initiatives (SAILD) started in 1991 has been one of the most successful rural newspapers conveying technical information in the two official languages (French and English) to farmers and extension agents [33]. Other public institutions with extension functions include the Institute for Agricultural Research for Development (IRAD) and the African Centre for Research on Bananas and Plantains. A number of NGOs and community-based organizations also support extension work throughout the country in providing extension and advisory services.

The Grassfield Participatory and Decentralized Rural Development Project

The Grassfield Participatory and Decentralized Rural Development Project (GPDERUDEP) was implemented as an anti-poverty programme in Cameroon between 2004 and 2010 within the context of Cameroon's Poverty Reduction Strategy. The objectives were to:

- Increase the incomes of small-scale farmers through increased agricultural output by the sixth year;
- Promote food security; and
- Improve the socio-economic environment of the rural population (MINADER, 2009) [41]. The expected outcomes of the project were grouped into three components including: agricultural development; capacity building; and rural infrastructure. A loan agreement of CFAF 15,726 million was ratified in 2004 between the Cameroon Government and the African Development Bank, which provided 85% of the funds while the Government contributed 10%, and the local communities, 5% [42]. The project constitutes one of the contributions of the African Development Fund to the implementation of the rural development strategy adopted by the Cameroonian Government. The strategy adopted under this project particularly hinged on decentralized rural development, notably community development at village level. It gives a central role to partnership, dialogue, consultation, empowerment and the participation of village communities, producers, development partners, governmental services and private operators. A decentralized funding approach was adopted through a Local Development Fund (LDF), which emphasized quick channeling of funds to improve extension service delivery in project communities. Agriculture and community needs were assessed and formalized into village development plans to guide the choice of projects for funding (MINADER, 2010) [43].

A Decentralized Project Structure

To avoid the bottlenecks of the past whereby project activities were bundled in the routine administrative activities of government line ministries, a decentralized Project Implementation Unit (PIU) with financial autonomy was created at the North West Development Authority to oversee the day-to-day management of the project. The PIU team was made up of a Unit Head, specialized in the planning of rural development activities, an agronomist, a socio economist responsible for gender issues, and an environmentalist responsible for monitoring the impact of the project on the environment. Support staffs comprising a cashier, a secretary, 3 drivers and a messenger were also provided for the project. The PIU was provided with a financial management expert and community development technical assistant respectively from a private consulting firm.

An Innovative Funding Mechanism for Extension and Advisory Services

Despite the existence of numerous commercial banks and micro-finance institutions in Cameroon, no bank or financial institution is specifically devoted to financing the rural sector [44]. As a result, farmers therefore operate in a very uncertain economic environment with high price volatility. Risk is one of the main barriers to investing in agriculture: farmers avoid innovating and reduce their reliance on inputs, and financial institutions will not offer credit without insurance cover. The Local Development Fund (LDF) was an innovative mechanism designed to facilitate access to financial assistance by rural communities for extension initiatives. The fund was utilized for the construction of social infrastructure such as water supplies, health facilities, classrooms, farm buildings and farm inputs using an approach that ensures good governance and sustainability. Agriculture and rural development in the North- West Region takes place at two levels: the level of the Village and the level of the Municipality. At the village level, development activities are carried out through Village Development Associations (VDA) or Area Development Associations (ADA), which are Community-Based Organizations (CBOs) established for promoting rural extension. In cases where a number of villages are organized into a development agency, the development tasks of the communities are performed by an Area Development Association. Generally, VDAs and ADAs are registered organizations under Law No. 90/053 of 19 December

1990 on Civil Liberties and Freedom of Association [45-47]. The LDF was managed at three levels: the Village Community, the Council, and the Divisional levels (MINADER, 2009). Funds from the ADB were paid into the account of the Autonomous Sinking Fund (ASF) in Yaoundé, which is the first entry point of LDF funding into the national banking system [48]. The ASF made disbursements to LDF Divisional Management Committee accounts in approved financial institutions of each Division, and also Village Development Banks. This funding mechanism allows for the pooling of funds and distribution to end users based on demand. In this case, stakeholder forums consisting of farmer groups bring together concerns for required extension services. The farmers identify and use selected qualified service providers to contribute to improve their agricultural conditions. Accounts were opened at approved financial institutions by elected representatives of VDAs or ADAs for depositing development funds contributed by the population. At the Divisional level, all funds from the ASF are put into the bank account of the LDF Divisional Management Committee. The signatories to the account are the elected chairpersons of the LDF Divisional Management Committees and the GP-DERUDEP project manager. Sub-accounts are operated within the LDF Management Account at the Divisional level for each Municipality with responsibility to open appropriate management and accounting records for each LDF beneficiary community under their jurisdiction. Such records constitute internal book-keeping accounts managed by the accountant in each Municipality and the bookkeeper in the communities. The LDF Divisional Management Committee makes payments to service providers, contractors and communities directly with funds disbursed by the ASF [49]. The release of project funds was done subject to prior authorization by the appropriate project officials. After carrying out needs assessments and relevant studies for LDF approved projects in each Division, an annual budget for the projects was established and approved by the LDF Divisional Management Committees. Disbursements were then made by these committees to the Municipalities in accordance with the procedures outlined in the LDF Manual of Procedures (MINADER, 2009).

Impact of the Project

Extension impacts per se are very difficult to show, especially in terms of dealing with attribution issues and linking cause and effect quantitatively. In general, agricultural extension has been shown to have significant and positive effects on knowledge, adoption, and productivity [5,50]. GP-DERUDEP had an impact on agricultural production, capacity building and infrastructure development, especially as previously neglected rural areas had access to Local Development Funds to satisfy their agriculture and rural development needs.

Agricultural Production

The activities envisaged under GP-DERUDEP entailed: (i) an increase in the incomes of the farmers supervised (annual additional agricultural income per person ranging between CFAF 91,000 and CFAF 180,650); (ii) creation of 29,300 permanent and temporary jobs; (iii) creation of a self-promotion capacity for rural development operations by the beneficiaries; (iv) increased empowerment of farmers and development of human resources in general leading to a better organization of the rural world; and (v) promotion of small operators (day workers, artisans, farm workers, micro-enterprises and NGOs), following the experience acquired through the participation of associations in project identification and implementation. Increased agricultural production contributes to increase the level of coverage of the needs of the communities in the Grassfield area in basic foodstuffs and to raise the level of their income. The smallholder farmers in the region were able to bear some expenses relating to food, health and education. This resulted in an improved socio-economic situation and a reduction in the incidence of poverty. Women organized into agricultural common initiative groups and cooperative associations benefited from the LDF and village funds to finance their agricultural activities. GP-DERUDEP addressed issues related to improvement of crop yields through expansion of arable areas, intensification, improved access to input and output markets, income generation, and strengthening of the institutional capacity of the farmers through better extension and advisory service delivery. In this light the project procured and distributed 13 tons of improved maize, 88.5 tons of seed potato, 2 tons of beans, 16,000 tons of cassava cuttings, and 46 tons of rice as well as 265,000 day-old chicks, 543 piglets as support to farmers (MINADER, 2010). Production surpluses were sold on the local markets or exported to other regions or neighboring countries. At the start of the project the average financial prices for the various crops in the North-West region were: CFAF 180/ kg for maize, CFAF 84/kg for rice, CFAF 250/kg for groundnuts, CFAF 72/kg for potatoes, CFAF 128/kg for cassava, CFAF 150/kg for yam, CFAF 76/kg for plantain, CFAF 279/kg for beans and CFAF 60/kg for sweet potatoes (ADB, 2003). In view of the prevailing unmet high demand, partly due to the poor state of the road network in the region, the increase in production did not have much negative impact on prices because of the rehabilitation of feeder roads which facilitated access to markets. The availability of water supply systems, as a result of the project contributed to alleviating the daily chores, which allowed the women in particular to give greater attention to income-generating activities, such as vegetable gardening, seed production, processing and marketing of farm produce including backyard livestock rearing. Increased agricultural production contributed to increase the level of coverage of the needs of the rural communities in basic foodstuffs and to raise the level of their income. The project addressed issues related to improvement of crop yields through expansion of arable areas, intensification, improvement of animal health and the marketing of agricultural commodities, through improved access to input and output markets, strengthening of the farmers' institutional capacity and networking for improved service delivery.

Capacity Building and Institutional Development

Baser and Morgan, note that capacity is essentially about the ability to do something effectively and to sustain improvement over time [51]. They argue that people function within a range of complex human systems and often suffer from both low levels of

capability and system blindness. In this context the challenge for development experts is arguably one of making systems visible and encouraging the emergence and growth of capabilities on a micro level to engage with and function within those systems. Capability is defined as the collective skill or aptitude of an organization or system to carry out a particular function or process. Baser and Morgan (ibid) identify five core capabilities: the capability to commit; the capability to carry out technical, service delivery and logistical tasks; the capacity to relate and attract resources and support; the core capability to adapt and self-renew; and finally, the capability to balance diversity and coherence, as well as building networks while managing paradox and tension. The GP-DERUDEP coordination unit carried out the field implementation tasks of the project satisfactorily. The project envisaged the training of public sector extension field staff and those of civil society organizations in information, education and communication methods to raise awareness on the prevention and control of endemic diseases and HIV/AIDS. This pandemic is changing the profile of rural poverty in Africa as it puts an unbearable strain on poor rural households, where labour is the primary income-earning asset. The capacity building component also targeted community mobilization and the professionalization of farmers through advisory services. In this light the project organized the training of 35 Extension Agents of the Ministry of Agriculture and Rural Development, 320 municipal councilors of the North West Region, and 20 adult literacy facilitators. The institutional improvements included recruitment of an environmental specialist, continuous training of the agricultural extension agents to expand their sphere of activities and become more general development facilitators in the rural milieu. The project developed collaborative arrangements between the Ministries of Agriculture, the Ministry of Livestock and the Ministry of Scientific Research, modifying the delivery of extension services in several respects, and carrying out the process in a participatory manner. In collaboration with the Agricultural Research Institute (IRAD-Bambui), and the Regional Delegation for Agriculture and Rural Development, farmer organizations received training in appropriate techniques of production, storage and marketing of seed and ware potatoes (*Solanum Tuberosum*), cassava (*Manioc Esulenta*), and yams (*Discorea species*). Such trainings were conducted in the key producing areas involving in-house discussions and field demonstrations with opportunities for participating farmers to adopt the innovations. The workshops provided an interactive learning forum on appropriate techniques of crop cultivation, harvesting, processing and storage. Extension Booklets were produced on these crops for use by farmers and field extension staff. Thirty five community development field staffs of the Regional Delegation of Agriculture and Rural Development were trained in Information, Education and Communication methods, while 320 members of deliberating organs of municipal councils were trained in techniques of community mobilization and rural outreach work. The project raised public awareness among 12,700 persons regarding prevention and control of endemic diseases and HIV/AIDS. Thirty-two motorcycles were purchased for use by agricultural extension workers in their contacts with farmers. Extension messages were published on a monthly basis in the *Farmers' Voice' News Bulletin* and equally broadcast in local languages and Pidgin English (a lingua franca) over 5 rural community radio stations established with support from the project to raise awareness in rural communities on issues related to agricultural development and social change (MINADER, 2009). While extension methods involved the traditional field visits and demonstration on farmers' plots the use of radio programmes and the *Farmers' Voice Newspaper*, provided information on crop cultivation and current market prices. The ICTs which are most valuable in facilitating interactivity to farmers in rural areas include radio, television and mobile phones. Cameroon, has allowed its public extension services to be gradually complemented by farmer organizations and private extension service providers [18].

Rural Infrastructure

The project supported the construction of community infrastructures to facilitate the marketing of agricultural commodities and improvement in rural living conditions. In this regard 32% of the projected length of 247 km of feeder roads leading to the most productive and remote farming areas identified in the village development plans were rehabilitated, 53% of the projected water supply schemes and health centres were constructed as well as 67% of classrooms, leading to an increase in school enrolment as a result of the added space. The local communities contributed 30% of the costs of infrastructure in the form of labour, building materials or cash (MINADER, 2010).

The impacts of the project on the environment resulting from rural infrastructure works and those for agricultural production were minimal as a result of the application of appropriate mitigating measures. The rehabilitation of clean water supply systems contributed to curb the incidence of water-borne diseases as well as the strenuous chores of water fetching by women and children. Most of the potentially negative impacts were limited to the period of implementation of the project. These included: (i) risks of erosion related to site works; (ii) development of parasites in intensified crops; and (iii) accumulation of non-biodegradable packaging products. The project took a set of mitigating measures including: (i) integration of environment friendly technical specifications in the terms of reference of the works bids; (ii) agricultural extension service provision in relation with NGOs and the National Agricultural Extension Programme; (iii) health education related to the management of water points and environmental hygiene; and (iv) respect for the environment as criterion for the approval of funds for micro-projects. The activities realized under the project entailed a social impact in terms of an increase in the incomes of the farmers supervised, creation of jobs and increased empowerment of farmers and development of human resources in general leading to a better organization of the rural world following the experience acquired through the participation of associations in the implementation of community works. Increased incomes enable farmers to bear some expenses relating to food, health and education, thus reducing the incidence of poverty.

Lessons, Challenges and Prospects

Lessons Learnt

The main lessons that emerged from the implementation of GP-DERUDEP are as follows:

a) Mobility of Staff and social equity. Extension agents were provided with motor cycles to facilitate mobility in meeting with the dispersed farmers. Increases in crop and livestock yields can be achieved with an effective extension management system if linked with adaptive agricultural research and modified to the conditions in a particular region. However, whatever system to support producers is used, adequate mobility for the extension staff is a precondition for obtaining results that are broadly based on the farming population. Without adequate mobility for the staff, there will not be social equity among the farmers, because the staff will not be able to move far and wide from their administrative offices, and thus the poverty goal will not be fully attained.

b) Motivation of farmer associations and extension service provision. Successful agriculture and rural development is a complex task that requires support to production-related activities. The provision of additional funds for productive equipment and infrastructures can improve the motivation of farmers to produce more, make farm commodities more marketable, and strengthen the spirit of collaboration and willingness in forming associations. To overcome this constraint, supervision missions were jointly conducted with all stakeholders to ensure proper coordination of project implementation.

c) Reorientation of the farmer support system. Reorientation of the farmer support approach from a mass-extension system, such as the T&V system, to a more targeted approach of advisory support to producer groups initially reduces the number of benefiting families, because the farming groups, with their needs, require more of the extension agent's time to benefit from advisory support. The available project funds were not sufficient to cover all families at one go, and the new approach adopted by the project involved targeting farmer groups in phases to offer a way of making people and their organizations more development-oriented. It was hoped that the farmer groups assisted during the first phase will attain a certain level of self-reliance to develop their members' economies without further project assistance, at which time the available project funds could be used on farmer association chosen to benefit from a second phase.

d) Capacity building for NGOs and private sector organizations. Using NGOs and private sector service providers as implementation agencies for project activities like agricultural extension, appears promising in theory, but in practice NGOs or consulting firms capable of carrying out extension work are few. Where they are available, they seldom have the same skills as civil servants who have received systematic training and have several years of work experience. Involving NGOs in such tasks, requires that policy makers and project planners provide sufficient funds for capacity building in these organizations before they are given tasks initially provided by the public sector. Also, a financing system that allows prepayment for services is necessary, because NGOs do not usually have funds to start new activities or enter new areas. Using farmer organizations as a basis for extension investments gives economic incentives to the village populations, but also benefits beyond those that are strictly economic such as providing a forum for raising awareness about women empowerment and environmental and health issues. The lessons learnt from the experience in the implementation of GP-DERUDEP, indicate that the participatory approach fails to take into account what Cleaver, describes as the recursive relationship between structure and agency [52]. Consequently, it tends to lay more emphasis on the organization of collective action, treating participation as a technical method of project work while ignoring the complexities of power as embedded in social and cultural practices. The success or failure of participatory project interventions depend as much on the conditions surrounding the particular intervention as on the quality of the work done at the local level. These include: economic growth, an enabling political and administrative environment, good governance, and the presence of ideologies that favour participation, self-reliance and collective action (ESCAP, 2009) [53].

Challenges and Future Prospects

The challenges that make participatory extension unlikely to attain full success in rural development projects include: a lack of income and productive assets; a lack of access to essential economic and social services; a lack of power, and the role of the state [53]. Such factors reinforce each other, keeping the poor trapped in poverty [54]. A lack of awareness of this multi-dimensionality of rural poverty and reluctance to confront it, may explain much of the failure of past agricultural and rural extension strategies in reducing poverty. Participation within rural communities needs to go beyond the rhetoric of poverty alleviation, and target the empowerment of people to become less dependent on relations of patronage for daily subsistence. Another challenge of participatory extension concerns contextual factors and the role of the state, which must deliberately formulate proactive policies, backed by appropriate and timely resource allocation to alleviate poverty. For this to occur, the state must work with the rural communities in partnership, creating the conditions for their participation and supporting them with resource transfers, capacity building and the promotion of social justice. Extension generally suffers from weak political commitment and support, because it is difficult to attribute agricultural performance to extension efforts, and because extension activities are not as visible as other investments such as irrigation or road projects. Thus, in a context of limited fiscal resources, decision-makers tend to assign low priority to extension. Sporadic expansions of extension systems that are spurred by external donor-funded programmes tend to be short-lived because, once the external funding is exhausted; there is no domestic political support for the higher levels of funding [55]. Problems in extension systems were due to a combination of a lack of relevant technology, failure by research

and extension to understand and involve clientele in problem definition and solving, lack of incentives for extension agents, and weak linkages among extension, research, and farmers. Challenges remain in implementing decentralization policies; and there are persistent economic constraints and dependence on external sources of funding agricultural extension activities. Cameroon's decentralization programme is not achieving its set objectives because citizen participation in decision-making, transparency in programme implementation, accountability and the involvement of the local people is still a myth. A centralized government by and large continues to influence development at the grassroots [56]. These challenges and the long-term neglect in improving agriculture and rural living conditions must be overcome to improve the chances for success of innovative extension programmes. Such challenges call for a move towards best practice models, where location specific and participatory extension approaches are used.

Conclusion and Policy Implications

Despite the promising results of innovative extension approaches, many obstacles remain, preventing one-off initiatives from becoming available to the majority of producers. The GPDERUDEP provided unique space to evaluate theoretical postulates on extension development within a sub-Saharan African country. The absence of a policy for long-term financing of smallholder agriculture, combined with episodic development aid actions are the two main barriers to scaling up, building sustainable institutions and delivering extension and related services adapted to the diversity of the agricultural sector as a whole. The task of experimenting innovative agricultural extension and advisory service approaches in Cameroon is demanding, but with determination and diligence, adoption of innovative systems will serve as the missing link to agriculture and rural transformation. Setting in motion a long-term action plan toward gradual adoption of innovative agricultural extension service delivery systems in Cameroon should be the ultimate goal as smallholder farmers transform from subsistence to commercial operations. Because of the diversity of approaches, public and private extension agents in the country will need special skills to be able to provide appropriate advisory services to farmers. Agricultural extension remains a medium- and long-term investment in the same way as education and research, so the investment of domestic and external public resources for its promotion is fully justified in the context of Cameroon and the countries of sub-Saharan Africa. Addressing 21st century challenges facing agriculture, which include climate change, threats to food security for a growing population and downward economic pressures on rural livelihoods will require innovation in extension theory, policy and education, at a time when the dominance of the state in the provision of knowledge and information services to farmers and rural entrepreneurs continues to decline [8].

References

1. Saliu JO, Obinne PC, Audu SI (2009) Trends in agricultural extension services in Africa: Option for new approaches. *J Agri Ext Rural Dev* 1: 71-6.
2. Chukwuone NA, Agwu AE, Ozor N (2006) Constraints and Strategies Toward Effective Cost Sharing of Agricultural Technology Delivery in Nigeria: Perceptions of Farmers and Agricultural Extension Personnel. *J Int Agri Ext Educ* 13: 29-41.
3. Amungwa FA (2014) Participation, Networking and Privatization In Agricultural Extension. LAP LAMBERT Academic Publishing, Saarbrücken, Deutschland.
4. World Bank (2012) Agricultural Innovation Systems: An Investment Sourcebook, Agricultural and Rural Development. World Bank, Washington DC.
5. Anderson JR (2007) Agricultural Advisory Services. Background Paper for World Development Report 2008: Agriculture for Development. Washington, D.C.: World Bank.
6. Feder G, Willett A, Zijp W (2001) Agricultural Extension: Generic Challenges and the Ingredients for Solutions. In *Knowledge Generation and Technical Change: Institutional Innovation in Agriculture*, Ed. S. Wolf and D. Zilberman, 313-56. Boston: Kluwer.
7. Anderson JR, Feder G (2004) Agricultural Extension: Good Intentions and Hard Realities. *The World Bank Research Observer* 19: 41-60.
8. Garforth C (2010) Adapting To New Challenges: Extension Theory And Practice For The 21st Century. In: *International Conference on Agricultural Extension (Agrex 10)* 26-28.
9. Birner R, Davis K, Pender J, Nkonya E, Anandajayasekeram P, et al. (2006) From Best Practice To Best Fit: A Framework For Designing And Analyzing Agricultural Advisory Services. ISNAR Discussion Paper No. 5. Washington, D.C.: IFPRI.
10. Neuchâtel Group (1999) Common Framework on Agricultural Extension. Paris: Bureau of Agricultural Policies and Food Security [Bureau Des Politiques Agricoles ET De La Sécurité Alimentaire].
11. Wallace I (1998) Rural Knowledge Systems for the 21st Century. Rural Extension in Western, Central and Eastern Europe. AERDD, the University of Reading.
12. Diao X, Thulow J, Benin S, Fan S (2012) Strategies and Priorities for African Agriculture. International Food Policy Research Institute, Washington, DC.
13. Rivera WM, Qamar KM, Crowder LV (2001) Agricultural and Rural Extension Worldwide: Options for Institutional Reform in Developing Countries. Rome: Food and Agriculture Organization of the United Nations.
14. Rivera WM, Zijp W (2002) Contracting For Agricultural Extension: International Case Studies and Emerging Practices. Wallingford, U.K.: CABI.
15. Rivera WM, Alex G (2005) Extension Reform for Rural Development: Case Studies of International Initiatives, Washington DC. World Bank and United States Agency for International Development: 1-5.
16. Chipeta S (2006) Demand-Driven Agricultural Advisory Services. Lindau, Switzerland: Neuchâtel Initiative.
17. Birner R, Anderson JR (2007) How To Make Agricultural Extension Demand-Driven? The Case of India's Agricultural Extension. Discussion Paper 729. Washington, D.C.: International Food Policy Research Institute.
18. World Bank (2004) Extension and Rural Development: A Convergence of Views on Institutional Approaches. Agriculture and Rural Development Discussion Paper, World Bank Washington, DC: 04.
19. Sparks C (2007) Globalisation, Development and the Mass Media, Sage, London.
20. Nyambi GN, Shinn GC, Briers GE (2016) Factors That Influence Extension Program Success: What Can We Learn From Cameroon Extension? *Int J Agricultural Extension* 4: 149-58.

21. Servaes J (1999) *Communication for Development: One World, Multiple Cultures*, Hampton Press, Inc., NJ.
22. Gaventa J, Cornwall A (2006) *Challenging The Boundaries of the Possible: Participation, Knowledge and Power*, IDS Bulletin 37: 122-8.
23. Washington DC World Bank. Rahman MA (1993) *People's Self-Development: Perspectives on Participatory Action Research*, Zed Books, London.
24. Malgie WS, Ori L, Wolfgang J, Vanwing T (2018) Agricultural extension services using a participatory approach in vegetable growing areas in Suriname. *Int J Agri Ext Rural Dev Stu* 5: 20-33.
25. Chambers R (1994) Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm, *World Development* 22: 1437-54.
26. Schafft KA, Greenwood DJ (2003) *Promises and Dilemmas of Participation: Action Research, Search Conference Methodology, and Community Development*. *J Comm Dev Soc* 34:18-35.
27. Herman JL, Morris LL, Fitz-Gibbon CT (1987) *Evaluator's Handbook*. Sage Publications Inc., Newbury Park, California, USA.
28. Umali DL, Schwartz L (1994) *Public and Private Agricultural Extension: Beyond Traditional Frontiers*, World Bank discussion papers, The World Bank, Washington DC: WDP 236.
29. Adhikarya R (1994) *Strategic Extension Campaign. A Participatory-Oriented Method of Agricultural Extension. A Case Study of FAO's Experiences*. Rome: FAO.
30. Pretty J, Vodouhe SD (1997) *Using Rapid or Participatory Rural Appraisal*. In: *Improving Agricultural Extension*. FAO, Rome.
31. Amungwa FA, Nji A (2015) *Appraisal of the Participatory and Decentralized Approach To Rural Community Development in Cameroon*. *J Cameroon Academy Sci* 12.
32. Amin AA (Ed.) (2008) *Developing A Sustainable Economy In Cameroon*. Council For The Development Of Social Science Research In Africa [CODESRIA].
33. Swanson BE, Rajalahti R (2010) *Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems*. Agriculture And Rural Development Discussion Paper No. 45. Washington D.C: The World Bank.
34. Richards L, Dalbey M (2006) *Creating Great Places: The Role of Citizen Participation*. *J Community Dev Society* 37:18-32.
35. Qamar KM (2005) *Modernizing National Agricultural Extension Systems: A Practical Guide for Policy-Makers of Developing Countries*. Rome: Food and Agriculture Organization Of The United Nations.
36. Heck BV (2003) *Participatory Development: Guidelines On Beneficiary Participation In Agricultural And Rural Development*. 2nd Edition. Rome: FAO.
37. Pesche D, Francois JL (2007) *Common Framework on Agricultural Extension (2nd Edn)* Bureau of Agricultural Policy and Food Security, France.
38. Davis K (2006) *Farmer Field Schools: A Boon or Bust for Extension in Africa?* *J Int Agri Ext Educ* 13: 91-7.
39. Braun A, Jiggins J, Röling N, Van Den Berg H, Snijders P (2006) *A Global Survey And Review of Farmer Field School Experiences*. Nairobi: International Livestock Research Institute.
40. Berg HVD, Jiggins J (2007) *Investing In Farmers: The Impacts of Farmer Field Schools In Relation To Integrated Pest Management*. *World Development* 35: 663-86.
41. Monitoring and Evaluation Unit, Bamenda (2006) *Baseline Study of the North West Region*. MINADER, Yaoundé.
42. African Development Bank [ADB] (2008) *Cameroon: Evaluation Of Bank Group Assistance To The Agriculture And Rural Development Sector 1996-2004*, Operations Evaluation Department, Abidjan.
43. MINARDER - Ministry Of Agriculture and Rural Development (2010) *Grassfield Participatory and Decentralized Rural Development Project: Appraisal Report*.
44. African Development Fund [ADF] (2003). *Cameroon: The Grassfield Decentralized And Participatory Rural Development Project*. Department Of Agriculture And Rural Development, West And Central Region.
45. Presidency of the Republic Of Cameroon (2008) *Decrees No 2008/013 And 2008/014 of 17 January 2008, Respectively On The Reorganization And Functioning Of The National Decentralization Council (NDC) And The Organization And Functioning Of The Inter- Ministerial Committee For Local Services (ICLS)*.
46. Yaoundé (2000) *Law No 2000/365 of 11 December 2000 Amended By Decree No 2006/182 Of 31 May 2006 To Reorganize FEICOM*.
47. Yaoundé (1990) *Law No 90/053 of 19 December 1990 on Civil Liberties and Freedom of Association*.
48. Yaoundé (2009) *Grassfield Participatory and Decentralized Rural Development Project: Progress Report*.
49. Akoa PC (2008) "The FEICOM Experience in the Financing of Communal Projects" ["L'Experience Du FEICOM En Matiere De Financement Des Projets Communaux"] Paper Presented At The African Conference On Decentralization And Local Government, Yaoundé.
50. Birkhaeuser D, Evenson RE, Feder G (1991) *the Economic Impact of Agricultural Extension: A Review*. *Economic Development and Cultural Change* 39: 607-50.
51. Baser H, Morgan P (2008) *Capacity, Change and Performance: Study Report*. European Centre for Development Policy Management Discussion Paper No 59B Available.
52. Cleaver F (2001) *Institutions, Agency and the Limitations of Participatory Approaches To Development*. Chapter 3 in Cooke and Kothari 36-55.
53. ESCAP - Economic Commission for Asia and the Pacific (2009). *Participatory Approaches to Rural Development and Rural Poverty Alleviation*. Bangkok.
54. Nji A (2004) *Why Poor People Remain Poor: Key Elements of Poverty Alleviation and Sustainable Development*. Buma Kor Publishers Ltd. Yaoundé.
55. Anderson JR, Feder G, Ganguly S (2006) *the Rise and fall of Training and Visit Extension: An Asian Mini-Drama with an African Epilogue*. *Research Working Paper* 21: 3928.
56. Banlilon VT, Abangma AJ, Ambe MB (2012) *The Dilemmas Of Implementing Decentralization Policies In A Centralized State Construct: Evidence From Some Municipalities In The North West Region Of Cameroon*. In *African J Social Sci* 3: 97-110.