
Experience of Small-scale Farmers in Analog Forestry Extension in Cameroon: Methods

Kemkia Christian Danernyuy*

Department of rural socio-economics and agricultural extension, university of Dschang, Dschang, Cameroon

Email: ckemkia@yahoo.com

Abstract

The adoption of unsuitable extension methods to promote participatory analog forestry in the under developed countries because of stereotype institutional policies and profit maximization has led to poor participation of farmers in analog forestry extension programs. The study titled “Participatory analog forestry extension: the experience of small-scale farmers and institutions in the Northwest and Southwest Regions of Cameroon” was designed with the objective of contributing in the enhancement of a better participatory analog forestry management for extension institutions and farmers through an analysis of participatory analog forestry adoption methods. One hundred and fifty two [152] questionnaires were purposively administered to contact and non-contact farmers. An interview schedule with 24 extension workers from eight [8] participatory analog forestry institutions [CENDEP, TROPEG, RTC, RDC, FAP, FOREP, GREEN CARE and GEADIRR] that make up CAFON and operating in the study area. Focus group discussions were carried out with 4 women groups, 2 youth groups and 2 groups made up of men and women. Field observation on tree type, nursery development and local potential for analog forestry were carried using the analog forestry serial stage model. Data collected were collated, coded and analyzed using the Chi-square at 0.05 alpha levels of significances to test differences. SPSS 6.1 version was used for cross-tabulations and contingency tables that generated frequencies and percentages. The findings revealed that; 5 extension methods have been adopted by all the institutions [farmer field visit [27.25%], public stakeholder meetings [23.22%], group approach [21.20%], training and workshop method [21.20%] and the exchange visits approach [14.13%]] and 68% farmers were involved in the initial stages of planning, decision making and implementation. Monitoring and evaluation and farmers' inputs was 34% absent but farmers who had participated in extension programs 67% were better adopters of analog forestry than those who had not.

Keywords: small scale farmers; analog forestry; extension; methods and participation.

* Corresponding author.

1. Introduction

The concept of peoples' participation has entered the core of global development and environmental agenda since the beginning of the 21st century. Among analog forestry researchers and policy makers, people's participation is now widely acknowledged as an integral component in development, dissemination, adoption and enhancement of analog forestry technologies and sustainable analog forestry practices. The involvement of the local people in identifying their problems and needs, ranking them, collecting relevant data, proposing and deciding a plan of action, and in the implementation of the selected plan has been enhance through the Participatory Rural Appraisal [PRA] [1, 2]. Recognition that local people and their knowledge are the basis of the solution to their problems and needs reaffirms this point. Efficient farmer organizations may provide the opportunity for small farmers to co-operate and take advantage of the economies of scale with respect to payment for extension services [3]. Stated that new government policies have brought about greater participation of private companies and non-governmental organizations in extension service delivery to farmer clients. This trend is increasing the effectiveness and sustainability of the information systems available to farmers, implying that farmer needs and demands will be reflected through market mechanisms including prices for information. Farmer attitudes would need adjustment from traditionally receiving free information and advice to payment for the services and therefore serious thought has to be given to ways of expanding their income-earning ability. Analog forestry extension agents are therefore charged with the responsibility of bringing the message of analog forestry to rural communities; emphasizing on sustainability of the environment and optimizing farmers' income. In many countries, extension systems have undergone profound changes in the past 20 years. Centrally controlled, top-down approaches are being replaced by those that encourage organizations to interact with farmers as equal partners [4]. Owing to the difficulty in acquiring knowledge, skills and inputs, however, new technologies often do not spread easily analog forestry inclusive [5]. Research on the performance of various advisory service models can make important contributions to improving the quality of services offered to farmers and to the management of innovations provided for them [6]. Farmer participation in extension programs have been shown to increase the effectiveness and efficiency of farmer advisory services [7], but not enough is known about the role of these small-scale farmers in extension approaches within the agricultural innovation system [8] in Africa, and especially in Cameroon.

1.1. Problem statement

Top-down analog forestry extension strategies have failed in the promotion of farmers' participation in analog forestry extension programs. These strategies are bias to small scale farmers and do not focus on farmers existing situation [their needs, problems and potential]. According to [9] rural farmers provide up to 80% of the food consumed in a large part of the developing world but [4] say same small-scale farmers and the rural poor have largely been underserved by formal research and extension services thus making their participation and contributions to be very insignificant. A study of 230 rural development institutions employing some 30 000 staff in 41 countries of Africa found that, for local people, participation was most likely to mean simply having discussions or providing information to external agencies [10]. Government and non-government agencies rarely permitted local groups to work alone or participate fully in extension programs, some even acting without any local involvement; this, has led to the failure of over 87% of projects in sub- Sahara Africa [11]. Even

where external agencies did permit some joint decisions, they usually controlled all the funding. *The overall objective of the study was therefore Determine the extent to which extension methods adopted by analog forestry extension agencies involve the farmer in the delivery of their services and to identify the problems that hinder farmer participation in analog forestry extension both at the agency and farmer levels.*

2. materials and Methods

2.1 Description of the study area

North-West Region of Cameroon is part of the territory of the Republic of Cameroons, found in the western highlands of Cameroon. It is bordered to the southwest by the Southwest Region, to the south by the West Region, to the east by the Adamawa Region, and to the north by the Federal Republic of Nigeria. Bamenda is the capital of the region. The Northwest Region [known before 2008 as the Northwest Province] is the third most populated province in Cameroon. It has one major metropolitan city, Bamenda, with several other smaller towns such as Wum, Kumbo, Mbengwi, Ndop, Nkambé, Batibo, Bambui and Oshie. On the other hand, The Southwest Region or South-West Region is a region in Cameroon. Its capital is Buea As of 2015, its population was 1,553,320. Along with the Northwest Region, it is one of the two anglophone [English-speaking] Regions of Cameroon [figure 1].

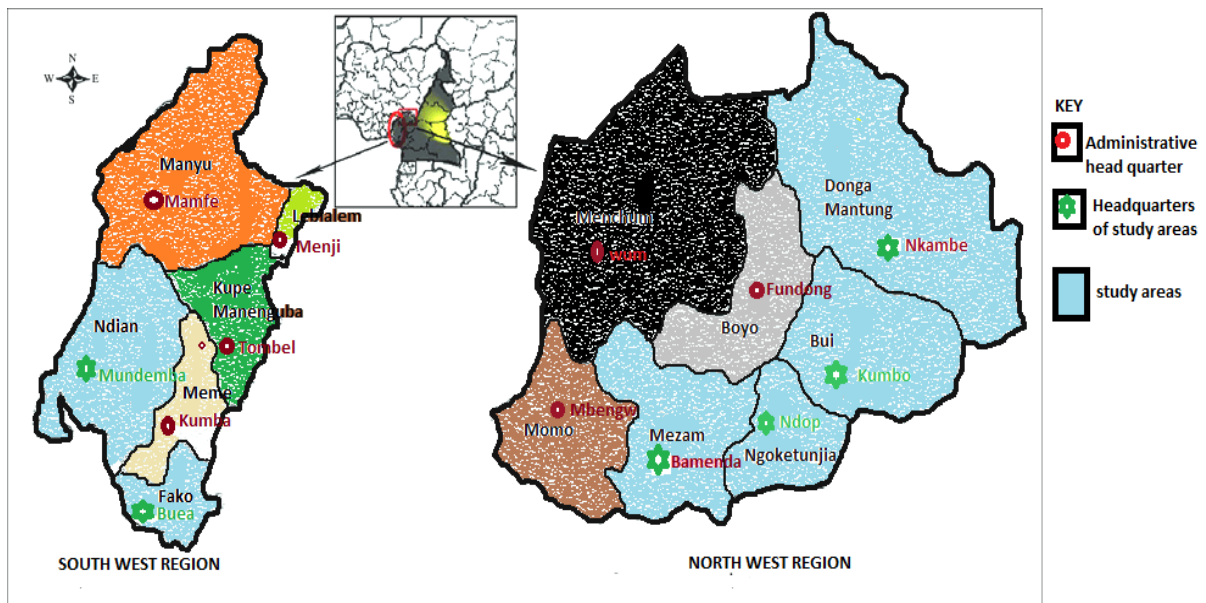


Figure 1: Map Showing the Study Area

2.2 Methodology of data collection

Many sampling techniques were used in the study. First, a stratified sampling technique was used to select the two regions [northwest and southwest] based on the fact that they fall within the zones of intervention of the Cameroon analog forestry network [CAFON]. To select the 6 Divisions where the study took place, purposive sampling was used due to the fact that they fall under CAFON zone of intervention. The six divisions selected

were; Ndian and Fako Divisions in the Southwest Region and Mezam, Bui, Ngoketunjia and Donga Mantung Divisions in the Northwest Region.

3. Results and discussions

3.1 Extension Delivery Methods Adopted by Institutions

For the fear of being misinformed and the need to acquire accurate information on the various extension methods, farmers through the questionnaires were asked to specify institutions and forums where information was received. Interviews with extension managers, subject matter specialists [SMS's] and frontline staff also provided vital information about methods used by extension agencies to reach out to the farmers. To also guarantee accuracy on the extension methods and their applicability, there was a general appraisal of reports of past projects implemented by the different institutions. The criteria use to evaluate the reports were the number of participants in the projects, methods use to disseminated analog forestry, participatory activities planned and implement in the projects and the successes and challenges faced in the course of the project. From the studies carried out, the following extension methods were identified; workshops and trainings, famer field visits, public stakeholders’ meetings, exchange visit method, group approach. Different institutions favored different methods that depended on resource availability [i.e., both financial and physical], manpower, target groups and overall guiding principles of an institution. Each method employed is discussed below.

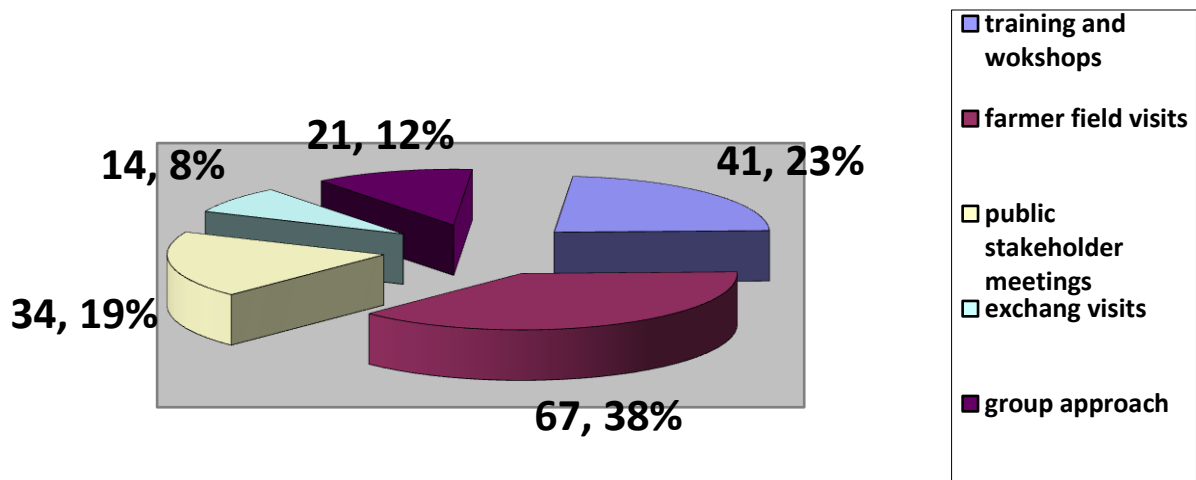


Figure 2: Extension methods adopted by analog forestry institutions

Figure 2 generally justifies all the explanation in the paragraph above. In a nutshell, different institutions favored different extension methods, which depended on resource availability of the institution, policy provisions and basic ideologies governing the management and operations of the institution.

3.1.1 Training and workshops

Trainings and workshops revolving around different topics in analog forestry have been held as methods of information dissemination to the farmers. The ideal behind training was to train a small number of farmers who

would, in turn through practice, benefit more farmers. These trainings and workshops happened in two ways; The first training and workshop involved the identification of Community based organizations by the different institutions that showed interest in the analog forestry innovation. After the identification of the group, together with the farmer organization, the implementing institution organize a training and workshop that could run for one day or for at most a week as identified by the respondents. For example, according to the Bikov Women Group in Mbiame, they have had several trainings by CENDEP and her partners like the International Analog Forestry Network [IAFN] in analog forestry methods, principles of Analog Forestry and women’s right to land management. Also, FAP used this approach to identify participants for their project titled Establishment and training of farmers on Analog Forestry in the Demonstration plot in Bamessing with support from IAFN Costa Rica in 2015. This mode of selection is justified by [11] that whichever way participants are selected, it is useful for planning purposes to have information about them as much in advance as possible, including where they are coming from, both geographically and organizationally, their professional background and expertise, and whether they are women or men. The second training and workshop method adopted by the institutions involved the selection and invitation of leaders of community groups to the seminars / workshops. In other words, it is the leaders of local groupings or institutions who were selected to attend the trainings and workshops. These leaders together with other leaders from different communities are then trained and provided with resources by sponsoring organizations like IAFN to go back then implement the knowledge acquired from the trainings and workshops. [12] acknowledges this saying that invitations about a workshop session are usually sent to authorities and at times with transportation and coordinating the preparation of food with local people. For instance, it was revealed that by the extension agents that CAFON invited local CBO leaders of their partnering organizations for a workshop on the strengthening of CAFON as a national network in Cameroon then trained them on analog forestry methodology with the help of an expert in analog forestry in 2012 in Bui division according to some of the respondents in this locality. Reports from CENDEPs archives showed that the workshop and training method has been used for over 47 times since 2014 and appeared to have been adopted as being very effective in attaining projects objectives and disseminating innovations; a method they still plan to continue using as responded by the organization’s extension workers.

Table 1: Number of Farmers Attending Trainings and Workshops by Host Organization

Institution	Frequency	Percentage
CENDEP	21	25.93%
TROPEG	14	17.28%
FAP	07	8.64%
RTC	17	20.99%
GREEN CARE	16	19.75%
RDC	06	7.41%
FOREP	11	25.93%
GEADIRR	0	0%

From table 1 above, according to the respondents, CENDEP and FOREP have champion analog forestry extension through the adoption of this method [25.93%] this is followed by RTC and RDC in the Northwest

with a percentage of 20.99% and 19.75% respectively next by TROPEG in the South West Region with a percentage of 17.28%. Respondents identified that in the course of the trainings and workshops, the trainings are usually led by a specialist in analog forestry methodology assisted by a community facilitator that help in the organization and mobilization of the community base organization and mobilize the basic logistics of the training. Subject Matter Specialist or Extension Agents to man each important point and explain the practice and answer farmers' questions. If a demonstrating farmer is involved, he should also play an active role, and may be assisted by the Subject Matter Officers [13]. After a particular message has been disseminated by the specialist, the participants are usually broken in to groups to form workshops depending on the number of people present. These groups are then assigned tasked to carry out and someone appointed by the group to do a presentation on the group's results; the process continues till the last group has presented their results which are then jointly evaluated by the specialist and the participants. The findings revealed that the different institutions during trainings and workshops varied in the topics covered confirming the words of [14] that that a series of favorable training outcomes are observed when training programs fit the learners' basic motivational orientation. According to 65% of the extension workers, the messages disseminated by the organizations did vary because organizations always made sure that when an opportunity like a workshop comes up, they use it to disseminate other information that relate to their general goals and objectives. [15] revealed that the three goals – Awareness, Understanding, Action - are not mutually exclusive; one or all of the goals mentioned above may be relevant to each potential audience. For example, an audience who can affect mainstreaming decisions will need to be exposed to findings for the purpose of awareness, understanding and some form of action. It was also realized that Government institutions that made up 7% of extension institutions like the various Divisional delegations of Forestry, Environment and Nature protection and Livestock and fisheries hardly did talk about analog forestry and many knew little about analog forestry. This was based on the fact that analog forestry is a new innovation that has not been widely spread in the country but still in the hands of NGOs who are trying to get the message across to farmers. As concern the location for the trainings and workshops, 78% extension agents revealed that for purposes of convenience and economy, most workshops were held at a venue close to the community of the farmers invited usually at a more central location within the Division. Besides, the duration of the workshops as earlier mentioned was short ranging between 1day to at most 1 week. All these factors favorably combined to cut down on the travel costs of farmers, expenses of hosting them and time spent on the course.

3.1.2 Farmer field visit

According to the study, farmer field visit involved the visit of either individual farms owned by farmers who have been trained and have adopted the analog forestry innovation or the visit of the demonstration farm of the organization implementing the analog forestry project in the community. It should be noted that the farmer field visit method is a follow up method be it after the famers have been trained on a particular' innovation or technique in analog forestry. In the field be it the Farmers farm or the institutions demonstration farm, the field agent together with the farmer carry out an observatory appraisal of the farmers' activities as far as the adoption of a particular analog forestry innovation the farmers have been trained on. [16] Affirmed that On-farm demonstrations are effective means of reducing the risks farmers perceive. They are designed to take new innovations out of the 'unreal', scientific realm of the research station and place them firmly within the bounds

of a farmer's everyday experience. This exercise is also followed or accompanied a question-and-answer session between the farmer and the agent. Records are also taken on the successes recorded so far and challenges faced by the farmers in their attempt to adopt the innovation. In a situation where the visit is of the demonstration farm of the project implementing institution, the agent could train farmers in a particular innovation design for that day; this is usually accompanied by observation of other techniques that were not programmed for the day by the analog forestry specialist of the institution. Like in the case when the agent paid a visit in the farmers' farm, the visiting session is also usually followed or accompanied by questions by the farmers and exchange of knowledge by the interaction of the farmers [13]. Confirmed this base on the fact that farm visits are the most common form of personal contact between the agent and the farmer and often constitute over 50 percent of the agent's extension activities. Because they take up so much of the agent's time, it is important to be clear about the purpose of such visits and to plan them carefully.

Table 2: respond of farmers concerning their participation in field visits, location and facilitating institution in the two Regions

Institution	Venue Of Farmer Field Visit	Frequency	Cumulative Frequency	Percentage	Cumulative Percentage
CENDEP	Farm	06	24	5,83%	22,33%
	Demonstration farm	17		16,50%	
TROPEG	Farm	11	17	1,68%	7,51%
	Demonstration farm	6		5,83%	
FAP	Farm	05	16	4,85%	15,53%
	Demonstration farm	11		10,68%	
RTC	Demonstration farm	13	13	12,62%	12,62%
GREEN CARE	Farm	12	34	11,65%	33,01%
	Demonstration farm	22		21,36%	

It was revealed that from all [table 2] that the visits granted on analog forestry extension be it to the farmers farm or the institutions demonstration farm, none has ever been carried out by the MINFOF or MINEP. This is based on the fact that analog forestry is still very tender in Cameroon and many government officials know little about it. GREEN CARE came out to be one of the institutions that have been adopting this method for the spread of analog forestry techniques [21%]; these visits according to the respondents took place in the nursery farm of the institution. Though they took people to their demonstration farms, 11% of the respondents still testified that they did paid visits to their farm and helped enhance their knowledge on the techniques they have been trained on. CENDEP, also did came out very strong in the adopting of this method in the two agro ecological zones with 16.50% of the farmers testifying that they have on several occasions paid visits to CENDEP's demonstration farms where they have been trained on many analog forestry innovations. 5.83% also confirmed that they have been visited by analog forestry specialist from CENDEP and at times accompanied by foreign experts in analog forestry that have partnered with CENDEP.TROPEG on the other hand, recorded very

high in the adoption of this method but rather in the area of spending more time in the farmers farms [10.68%] and just 5.83% in their demonstration center. according to the field officer for TROPEG was based on the fact that; TROPEG's objectives also include trainings on data collection and wildlife protection which at times demand more field visits that help farmer get familiarize with the methods of wildlife protection hence reason why they use this method the more see figure 10 below b that shows a field visit by farmers to the GREEN CARE nursery [17]. In his study in Kenya confirm this by saying that Field days in the FD were conducted during national tree planting days. Field days by VIAP were normally organized by Zonal Managers together with extension workers. The field days took place either at Olof Palme center or ADCs usually at the discretion of the Zonal Manager who, when deemed necessary, organized transport to the demonstration site. Farmers also indicated that they did not only learn analog forestry techniques from these visits be it to their farms or to some of the institutions but that they also were trained on other innovations. Some amongst these innovations included organic farming techniques like the production of compost and organic insecticides like fermented fruit and plant juice as indicated by farmers that have been visited or paid visits to the CENDEP demonstration farms. They were also trained on nursery development and management, farm management techniques that will help in the reduction of post-harvest losses and soil management techniques like the terrace farming technique that in 2016 was adopted by CENDEP to help mitigate soil erosion. The concept of Area Demonstration Centres [ADCs] as conceptualized by the management has been prompted by the desire to offer agroforestry options to the small-scale farmer in a manner affordable to and easily replicable by them. This is important particularly in forestalling the risk of farmers perceiving the techniques demonstrated as alien to them, too complicated and expensive - all being factors that can discourage adoption of practices learnt. Such was the folly taken according to [18], when introducing the RAP Project in Rwanda where about 100 model farms were established. These model farms were created to feature a full package of trees, crops, livestock-keeping and soil conservation techniques but ended up in low adoption by local farmers, not even the immediate neighbors, adopted the techniques on display.

3.1.3 Public stakeholders' meetings

Farmers and other survey respondents identified public meetings as one avenue for disseminating analog forestry messages in the study area. Nonetheless, public meetings were never specifically held for one purpose, this is, to promote analog forestry. The call for community participation in development projects and security saliently featured as some of non-analog forestry messages delivered during meetings. Normally, stakeholders 'public meetings are organized by the organizations bringing in the extension innovation. This is usually done with the knowledge of the local administrators; that is; D.O, the Chiefs and the local security post officials in the community. The presence of the local administrators was necessary for security reasons and to instill trust among farmers especially during the introduction of new projects. Also, respondents identified that in the two agro ecological zones many stakeholder meetings have been organized and held by the private institutions. Amongst those identified, we had 12% of the meetings have been organized by CENDEP, 25.24% by TROPEG 18.45%, these meeting were purposely held for the dissemination and transmission of knowledge on analog forestry. Other institutions like FOREP [10.68%], FAP [14.56%] and GREEN CARE 19.42% and RTC registered 11.65%; though it was revealed that these organizations during their public meetings also disseminated knowledge on other innovations. The survey revealed that during public meetings, government

officials talked more on policy related affairs and state matters. Analog forestry themes were mainly delivered by Subject Matter Specialists from CENDEP, Forest and environment and nature protection. This therefore is in line with the words of Michelsen [2000] who says that If organizational change is the expected out put in a project, it is important to involve policy makers, leaders and managers from the beginning of the project. Only their involvement can ensure that the project can induce any changes [Table 3].

Table 3: Number of Farmers Who Had Attended Public Meetings Covering analog forestry Themes

Institution holding meeting	Frequency	Percentage
CENDEP	26	25.24%
TROPEG	19	18.45%
FAP	15	14.56%
RTC	12	11.65%
GREEN CARE	20	19.42%
FOREP	11	10.68%

As shown in the table, NGOs that is; CENDEP [25.24%], GREEN CARE [19.42], TROPEG [18.45], FAP [14.56%] and FOREP [RTC [11.65%] were the greatest" users of public meetings as an analog forestry extension strategy. The Divisional delegations of MINADER, MINFOF, MINEP had used this method more than the rest of the institutions probably because it utilizes public as a means of sensitizing farmers about administrative affairs and policies of the country in these fields as well as other fields like health. This goes to confirm the work of [1] that extension institutions relay on the public meeting approach since this method appeared to be very cheap especially for Government institutions.

3.1.4 Exchange visit method

From the findings, it was revealed that CENDEP dominated in the use of exchange visits as an extension strategy. It showed that 22.56%of CENDEP’s analog extension farmers have been reached through this method, this was followed by TROPEG 17.88% and finally RTC/ GREE CARE with 13.91%of her farmers contacted through this method other organizations only had plans to carry on this method but could not succeed due to lack of funds to finance the activity. Table 4.

Table 4: Farmers Responses on Their Participation in Excursions by venue and Institution

Institution	Frequency	Percentage	Venue
CENDEP	34	22.56%	Outside and within
TROPEG	27	17.88%	within the division
RTC/ GREE CARE	21	13.91%	within the division

Following the responds from the farmers, CENDEP was identified as one of the organizations that has executed its extension activities using this method. From all the organizations that make up CAFON, CENDEP appeared

to be the only organization that operates in the two Regions where the studies took place. From the Farmers groups contacted for group discussions, two of the groups identified that they have been on exchange visits organized and sponsored by CENDEP and her partners. For example, according to the Forest Management Committee and the Bikov Women Group in Mbiame, they have been on two field exchange visit; first to visit the Kitiwum Development Union [KIDU] that amongst its objective is aimed at restoring the Kitiwum water catchment using analog forestry techniques and to another community in Vem to exchange ideas with the Bikov Forest Management Committee within the Bui Division. Secondly, another group call Mapanja Hand on the Ground Farmers Group from the Fako Division in the South West Region of Cameroon also identified that they have been on exchange visit to Mbiame in the Mbven Sub Division in the North west Region to exchange ideas with the Bikov Women Group and the Mbiame forest Management Committee. According to the CENDEP extension agents, this has been possible thanks to the fact that CENDEP is the leading organization in the dissemination of analog forestry methodology in Cameroon and spear headed the establishment of CAFON which also gives them financial opportunities to be able to use this method. A case in point is Koro Project in Mali, which after 3-4 years succeeding an excursion, fanners were unable to replicate Majjia Valley Project's windbreaks in Niger despite the impression created by the windbreaks.

Table 5: exchange between the president of Hands-on ground Mapanja and Bikov women group of Mbiame on their loan scheme

MANAGEMENT ISSUE	HANDS ON THE GROUND	BIHKOV WOMEN	Lessons/Remarks
Loan ceiling	15 TO 76 euro 15 € to 76 €	15 € to 61 €	
Loan duration	3 months	3months	
Eligible activities	Farm or petty business, sickness	Sickness, emergencies, rearing of animals, poultry farming, gardening, buyam salam, nursery establishment	
Interest rate	60% per annum	20% per annum	
Use of interest	Not stipulated	Entertainment of visitors, Forest conservation, transportation of group delegates to attend important meetings, purchase of group property	The will discuss and with community when they return. Are happy to adopt some elements from Bihkov's method.
Waiting period to obtain loan after submitting an application	One week. Loan only granted in the presence of six loan committee members	Depends on the availability of the loan management team. They learnt to put a fixed date	BIHKOV Women plan to adopt a time frame
Method of loan repayment	One instalment	One instalment	Small instalmental payments suggested, but not good to change what is working and members not complaining
Procedure to obtain loan	Application form is filled by applicant. Application is evaluated by 5 loan committee members	The group is divided into sub groups A, B and C. Loans are granted to a group at a time (A, B, or C) Each group has their turn to demand for loans. In case of emergency, members can negotiate amongst themselves	
Loan recovery procedures	Failure to repay loan on time attracts a punishment of 1.5€ In case of refusal to pay, village council is alerted. Defualter can be folowed in	Strong community bond/their social capital No forceful recovery yet They would report first to Forest Management Committee and then to	

To all participants, extension staff, administrators and farmers, windbreaks were seen as the solution to sand dune encroachment back at home. However, the windbreaks were not locally appropriate [Hagen, [19]]. This experience underscores the need to look for more locally appropriate examples to learn from in farmers' excursions as opposed to distant and expensive examples. Through the review and analysis of the project reports from CENDEP, it was realized that apart from CENDEP having the opportunity to work with many international that help to promote analog forestry, the organization at the time was implanting two projects simultaneously in these two communities that facilitated the financing of the exchange visits between these different farmers groups. In Mbiame and Mapanja, they were implementing a project titled “*restoration of degraded forest and rural agro-enterprises using analog forestry*” with funds from the Global Environment Facility/Small Grants Programme [“GEF/SGP”], Cameroon and Manos Unidas in Spain aimed at assisting members of these groups to established sustainable agro-enterprises using analog forestry. At the end of the exchange visit between the Hands-on Ground Women of Mapanja and the Bikov women Group of Mbiame, the Presidents of the two groups were given the chance to make a presentation of their loan scheme to stimulate discussions on similarities and differences in management by the two groups. Below is an excerpt of the exchange from the field report by CENDEP; [table 5].

From these exchange of opinion between the group leaders, a lot was established as concern methods adopted by two different groups to carry out one activity It therefore helped in the establishment of suggestions that could be adopted and abandoned by the different groups based on their experiences . Example of some suggestions arrived at as suggested by the group in the implementation of the project included; Increase list of eligible activities, Encourage regular savings to facilitate loan repayment and loan applications should be in writing. Among lessons learnt during field days were: Analog forestry techniques [13.91%, Soil conservation [2.50%], Nursery management [9.27%], Bee farming [3.97%], Catchment management [7.95%], Inventory on try species [6.22%], Biodiversity protection [7.28%], African traditional medicine [8.61%] and organic farming [8.61%] ;[Table 6].

Table 6: messages covered in exchange visits by the farmers

Message Delivered In Exchange Visit	Frequency	Percentage
-Analog forestry	21	13.91%
-Soil conservation	4	2.50%
-Nursery management	14	9.27%
-Bee farming	6	3.97%
-Catchment management	12	7.95%
Inventory on try species	10	6.22%
Biodiversity protection	11	7.28%
African traditional medicine	13	8.61%
organic farming	13	8.61%

From the field survey respondents identified many common messages. Analog forestry messages were, however, dominant as far as the messages represented in the exchange visits are concern. According to extension agents, analog forestry messages diversify to include other production-enhancing techniques that are easily accessible to the farmers. In fact the concept of Demonstration farm as conceptualized by the management has been prompted by the desire to offer analog forestry options to the small-scale farmer in a manner affordable to and easily replicable by them. In Sri-lanka, [20] asses' possible farm models, some including an analog forest that could be practically implemented within the context of a program of alley cropping for soil conservation.

3.1.5 Group approach

Interviews with extension managers and workers indicate that group approach is a recent phenomenon in the two Regions of CAFON intervention in an effort to disseminate knowledge on analog forestry. Table 7 summarizes extension contact by institutions through group approach.

Table 7: Farmers' Responses on Group Extension Method by Institution

Institution	Frequency	Percentage
CENDEP	27	17.88%
TROPEG	23	15.23%
FAP	23	15.23%
RTC	12	7.95%
GREEN CARE	18	11.92%
RDC	9	5.96%
FOREP	16	10.60%
GEADIRR	6	3.97%

CENDEP had reached the most number of farmers in the survey through the group approach. Started in 2001, the group contact by CENDEP has so far reached 17.88% of the farmers. TROPEG and FAP 15.23%, GREEN CARE had reached 11.92%,FOREP had reached 10.60% RTC had reached 7.95%, whereas RDC 5.96% and finally GEADIRR had reach 3.97%respectively. The survey further revealed disparities on how the concept of group approach was embraced and executed by extension agencies. Three notable distinctions in the manner of understanding and implementing group approaches were drawn from the experiences of CENDEP. CENDEP approaches this extension method by the formation of neighborhood groups of about 10-15 farmers. The groups serve as avenues to impart and exchange knowledge in analog forestry. On average extension workers interviewed had 8 of these groups, all of which were active. The process involves holding meetings between extension workers and group members where various issues in analog forestry and other institutional objectives are deliberated. Discussions revolve around farmers' analog forestry needs and problems, how to establish home nurseries, direct sowing/seeding, tree management and general analog forestry practices. Apart from free supply of seeds of selected tree species and nursery management tools like; wheel barrows hoes, watering cans and polythene papers, the role of the extension worker is to provide advisory services to the groups or farmers. This method has been successfully implemented in Oku as part of a pilot scheme in community forest management. In this scheme, each group comprised 12 - 15 members who meet often. However, the method varies with the one used by RTC as each group has a chairperson who is a contact farmer and that each

extension worker is required to include informal groups such as women and youth groups [21]. Unlike TROPEG and RTC, CENDEP tends to handle large groups of farmers, whose size vary depending on the population of farmers in a project designated area. The groups sampled in the survey ranged between 30 and 110 farmers. For this reason, most of the groups' activities are deliberated and executed through farmers' representatives. The process begins by the liaising with the local administration to call a public stakeholder meeting. This serves as a sensitization campaign and as a forum to elect or appoint the local coordinators or community facilitators. In addition, this arrangement provides an enabling environment to articulate the programs' objectives including the need to plant trees as analog forestry technique and soil and water conservation measures. After the approval of a project, the project extension worker together with local community facilitator and administrators [*i.e.* chiefs, sub-chief and village elders], planning and mobilization of farmers for implementation of activities decided upon then takes place. Most of the institutions were identified to use already established groups mainly women and youth groups as avenues for extension delivery. Extension Officials interviewed contended that if properly utilized the method is both a cheap and effective means of reaching out to the farmers. The main concern of the institutions is to assist the groups attain self-sufficiency in analog forestry techniques, tree production and management. However, the method leaves out a majority of farmers who are not organized in groups. Adopting a similar approach, farmers identified that they were also contacted through this method in a government sponsored program in 2010 call PACA; PACA reached the farming community through Women groups. The objective of the PACA as revealed by the survey was to facilitate and enhance women's role in restoration and protection of Forest in Bui Division, improve their livelihood and that of their families. The WWF on the other hand, uses Women and Youth Groups in articulating and implementing its objective of conserving catchment [22]. The foregoing discussion has identified five methods used by extension agencies in the delivery of extension services, namely: workshops and trainings, farmer field visits, public stakeholders' meetings, exchange visit method, group approach. There were however differences in terms of the methods preferred or commonly used by analog forestry extension institutions [Table 8].

Table 8: A Comparison by the Method Used between Institutions Delivering Extension Services

Institution	Training and Workshops		Farmer Field Visit		Public Stakeholders Meeting		Exchange Visits		Group Approach	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
CENDEP	21	25.93%	24	22,33%	26	25.24%	34	22.56%	27	17.88%
TROPEG	14	17.28%	17	7,51%	19	18.45%	27	17.88%	9	5.96%
FAP	07	8.64%	16	15,53%	15	14.56%	-	-	23	15.23%
RTC	17	20.99%	13	12,62%	12	11.65%	21	13.91%	12	7.95%
GREEN CARE	16	19.75%	34	33,01%	20	19.42%	-	-	18	11.92%
RDC	06	7.41%	-	-	-	-	-	-	23	15.23%
FOREP	11	25.93%	-	-	11	10.68%	-	-	16	10.60%
GEADIRR	-	-	-	-	-	-	-	-	6	3.97%

In terms of dominance, the Farmer field visit dominated in extension contact. According to the survey results, GREEN CARE [33,01%] had reached the greatest number of farmers using this method followed closely by CENDEP [22,33%] and FAP [15,53%]. This is attributed to the intensified extension efforts and the enabling environment in terms of human and physical resources in the non-governmental sector already discussed above. Increasingly however, in terms of usage and preference, we have Training and workshops, public Stakeholders meeting and the Group approach with cumulative percentages of 125.74%, 100.18% and 88.74% respectively. These approaches according to the extension agents were frequently being used by almost all the institutions because; it appeared funds are always being made available by the sponsors in situations of projects being implemented by the organizations and also when compared to the exchange visit approach, these methods or approaches appeared to be very cheap thus pushing all the institutions to adopt these approaches towards the extension of analog forestry. This is also attributed to the fact that the method optimizes training a few numbers of the farmers so as to benefit the rest through the spill-over effect which seems plausible. Due to the continuous drop in the resources, it is an indicator that this method will continually be adopted in the future. The rest of the methods were generally less utilized in extension delivery in the study area. Considering the proportions in terms of the use of the methods, however, exchange visits appeared to be the least used of all the extension methods identified. This is based on the fact that this method demands high economies of scale considering the high demands in terms of time, manpower and support resources required. From the cross examination of the CENDEP reports on the two projects [the project on Restoration and Protection of the Mbiame Community Watershed, NW Region Cameroon” sponsored by New England Biolabs Foundation and Restoration of the degraded Mbiame forest and rural agro-enterprise development using analog forestry sponsored by Global Environment Facility/Small Grants Programme [“GEF/SGP”], Cameroon that adopted this method, exchange visits alone, consumed 14% of the funds, and 23% respectively thus confirming the fact that the method is very expensive to adopt. From the survey therefore, it was realized that three of the institutions that is; CENDEP, TROPEG and RTC have use all the five methods to reach their farmers. According to the extension agents, this is based on the fact that the institution always makes funds available for them to carry out these methods whenever the need arises; while FAP and GREEN CARE have been able to use four of the approaches i.e., training and workshop approach, Farmer field visit, public Stakeholders meeting and the Group approach. FOREP on the other hand, has been able to use three approaches; namely, Training and workshops, public Stakeholders meeting and Group approach. This is due to the fact that exchange visit approach is very expensive. RDC, has been able to reach her farmers through two of the methods i.e., Training and workshops and Group approach. Finally, GEADIRR has only been able to reach her farmers using only one of the approaches which is the group approach. This, according to the extension agents is due to the difficulties accessing sponsors of their projects In other to determine if there was a difference in reference to the farmers reached based on the two categories of farmers that is; contact farmers and non-contact farmers, the frequency distribution between the variables contacted farmers, non-contacted farmers and reached was developed as shown in table 9.

Table 9: Frequency Distribution between Contact Farmers and Noncontact Farmers Reached by Extension Agencies

Reached	Contacted Farmers	Non-Contacted Farmers	Totals
Yes	102	28	130
No	1	21	22
Total	103	49	152

Table 10

Chi-square [X^2]	Degree of freedom	Critical value
47.08	1	3.841

Hypothesis Testing: Extension methods adopted by analog forestry extension agencies do not determine the adoption of analog forestry between contact and non-contact farmers.

Results of the Chi-square [X^2] indicated that the differences were significant at a 0.05 level. This implies that contact farmers have been recipients of extension messages and products more than non-contact farmers suggesting extension bias for contact farmers. This is based on the fact that since individual farmer field visits dominated as an extension method where extension workers are required to visit the farmer in his farm. This, justify the fact that the extension worker is liable to visit farmers that are more cooperating than non-cooperating farmers. This point is supported by the vast majority of the extension workers who perceived their efforts being frustrated by hostile or non-cooperative farmers. These results tie with the findings of [22] on the extension workers competency. In conclusion, the results have shown that four [5] types of extension methods [training and workshop, farmer field visit, group approach, public stake holder approach and exchange visits method] have been adopted by the extension institutions and small-scale farmers. Of these four methods, the farmer field visit method is the most preferred by the extension agents and the training and workshop, public stakeholder approach and the group approach are the most preferred by these institutions while the exchange visit approach is the least use because of the high cost if adopted. Messages disseminated to farmers using these methods are dominated by Analog forestry innovations and at times other messages like health, law and information relating to the objectives of the institution concern. The results further showed that contact farmers have received and adopted analog forestry techniques more than non-contact farmers based on the fact that the extension agents indicated that they prefer using farmer field visit approach because the contact farmers have shown interest in the innovation and will be readily available for field activities.

4. Conclusion

In terms of dominance, the Farmer field visit dominated in extension contact. According to the survey results, GREEN CARE had reached the greatest number of farmers using this method followed closely by CENDEP and FAP. This is attributed to the intensified extension efforts and the enabling environment in terms of human and physical resources in the non-governmental sector. The five methods used in extension

contact into the study areas, are very important and need to be reinforced and used fully. For example, the farmer field visits, could be used to address the problems of individual farmers, the group approach and exchange visits used to reach out to a wider crowd in situations where innovations or information need to be disseminated, the same thing applies for stakeholder meeting platforms, the training and workshop could be used to address technical parts of the innovations that might be difficult for farmers to understand. Notwithstanding the method used, farmers need to participate at every level of any program because it is only through this that their full potentials can be fully maximized.

Acknowledgement

Gratitude to my supervisor for the vivid scrutinization of this work for ambiguity and to the farmers of the 6 Sub Divisions and the extension workers of the 8 extension institutions where the study took place.

References

- [1]. Moehar, D., Darmawati & Niidalina. [2006]. PRA "Participatory Rural Appraisal": Pendekatan Efektif Mendukung Penerapan Penyuluhan Partisipasi dalam Upaya Percepatan Pembangunan Pertanian. Jakarta: Penerbit Bumi Aksara.
- [2]. Magni, Giorgia [2016]. "Indigenous knowledge and implications for the sustainable development agenda". Global Education Monitoring Report, ED/GEMR/MRT/2016/P1/20.
- [3]. Amungwa F.A. [2009]. "Appraisal of privatization of agricultural extension services in Cameroon". *Journal of Agricultural Extension and Rural Development* Vol. 1[3]. pp. 085-092, December, 2009 Available online <http://www.academicjournals.org/jaerd>
- [4]. CTA. 2011. "Agricultural extension, a time for change: Linking knowledge to policy and action for food and livelihoods". Technical Centre for Agricultural and Rural Cooperation [CTA]: Wageningen, Netherlands.
- [5]. Q
- [6]. Amungwa FA [2018]. "Appraisal of Innovations in Agricultural Extension and Advisory Services in Cameroon". *J v dA Plant Sci* 1: 206.
- [7]. Burton E. Swanson [2008]. "Global Review of Good Agricultural Extension and Advisory Service Practices". Food and Agriculture Organization of The United Nations Rome.
- [8]. Njabulo L. N., Muroyiwa B. and Melusi S. [2018]. Farmers' Perceptions and Factors Influencing the Adoption of No-Till Conservation Agriculture by Small-Scale Farmers in Zashuke, KwaZulu-Natal Province; sustainability, MDPI.
- [9]. IFAD. [2012]. Environment and natural resource management: Resilient livelihoods through the sustainable use of natural assets. Web page: http://www.ifad.org/climate/policy/enrm_e.pdf [accessed April 8, 2014]. Nairobi.
- [10]. Chambers, R. and Guijt, I. [1995]. "Participatory Rural Appraisal - Five Years Later: Where are We Now?" in *Forests, Trees and People Newsletter*, No. 26/27.
- [11]. FAO. [2017]: The future of food and agriculture – Trends and challenges. Rome.
- [12]. Susana G, Mary L, Mario L, Argentina P and Omar [2008]; Guide for training community leaders to

improve leadership and management practices, management science for health. 784 Memorial Drive. Cambridge, Massachusetts 02139-4613 USA.

- [13]. FAO. 2019. Agricultural Extension Manual, by Khalid, S.M.N. & Sherzad, S. [eds]. Apia.
- [14]. Said T. H. and Madina S. A. [2018]. Exploring the Factors That Affect Employee Training Effectiveness: A Case Study in Bahrain; Ahlia University, Manama, Bahrain. Sage open journal, <https://doi.org/10.1177/2158244018783>.
- [15]. Myers P. and Barnes J. [2004]. Sharing Evaluation Findings: Disseminating the Evidence; NESS UK.
- [16]. Fongang F.G.H, Soko E.J.B. [2017]. Viability analysis of community income generating activities [ciga]: case of agricultural processing [CIGAs] in the donga-Mantung Division, North West Region of Cameroon. *Asian Journal of Agricultural Extension, Economics and Sociology* 15[1]:1-16.
- [17]. Nwai S. [2000]; participatory agroforestry extension: the experience with small-scale farmers in trans-nzoia district, rift valley province, Kenya; Kenyatta university library.
- [18]. Kerkhoff, P [1990]. *Agroforestry in Africa: A Survey of Project Experience*. Panos Publications Ltd, London.
- [19]. Hagen, R. [1986]. *Koro Village Agroforestry Project, An Evaluation Report*. CARE, Bamako.
- [20]. Nuberg I.K and D.G Evans [1993]. *Alley cropping and analog forestry for soil conservation in the dry uplands of Sri Lanka*, kluwer academic publisher, printed in the Nertherlands.
- [21]. Ndenecho, E.N. [2005]. *Biological Resource Exploitation in Cameroon. From Crisis to Sustainable Management*. Unique Printers, Bamenda.
- [22]. CENDEP; *Feasibility Study on The Introduction Of Analog Forestry In Bui Division, NW Province Cameroon: Report On Community Consultation, study Financed By The Dutch Ministry Of Foreign Affairs And Oxfam Novib Through Both Ends*. December 2006.