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Local Potentials for Analog Forestry Extension in Cameroon: Case of the Northwest and South West Regions

Kemkia Christian Danernyuy
Department of Rural Socio-Economics And Agricultural Extension, Faculty of Agronomy and Agricultural Sciences (FASA) P. O. Box 222 Dschang, University of Dschang

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. 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 use for cross-tabulations and contingency tables that generated frequencies and percentages and finally, the SWOT and content analysis were used to treat data generated by focus group discussions with small-scale farmers and interviews with the extension fraternity. local potentials identified by the farmers included; knowledge in tree growing and use, knowledge in tree management and local support resources in the ratio of 4:2:1. The study concluded that farmers potentials have been under-utilized and there is a strong need for these potentials to be maximize by the various extension institutions for the promotion of analog forestry.

Keywords:- *Local Potentials, Analog Forestry, Extension.*

I. INTRODUCTION

Expounded that extension ideally embodies the integration of indigenous knowledge and derived knowledge, attitudes, and skills to determine what is needed, how it can be done, and what additional assistance is available to overcome particular obstacles. This however, cannot be achieved if local people are not actively involved. Participatory approaches, ensure that local people are involved in extension with the major strength being that they take their direction and emphasis on farmers' existing situation. They are therefore, according to (1), less likely to promote commodities or technologies that meet the external objectives but are not adopted because they do not meet the local demands or production conditions. Thus, participatory extension approaches can address highly heterogeneous needs of farmers better than centrally programmed approaches that are a characteristic of top-down extension strategies.

This is supported by the fact that whereas institutions can give directives and financial support, the actual managers are the farmers. (2). In Cameroon, one of the main features of agricultural development programs is its dependence on the small-scale farmers; based on the premise that a combination of factors comprising the right technology, effective extension services, and access to physical inputs, adequate markets and other infrastructural facilities are essential to improve productivity and the standard of living of the farmers (3).

According to (4), development of an analogue forestry design requires considerable work and its complexity necessitates the involvement of a large number of people from wide-ranging backgrounds. He further says that despite the high demand for these commodities, the selection and incorporation of early development crops into the design needs careful consideration. Some herb growers have suffered financially due to inappropriate choice and selection of crops and the decision to incorporate species for commodities must be strongly market driven. Therefore, many requirements have limit Analog Forestry application and it has yet to be widely adopted in Australia, despite its use in many other countries around the world a problem that is also greatly liken to Cameroon.

If the above problem is not addressed immediately the potentials that within farmers, the study, therefore hypothesizes that There is no gender-based disparities in opportunities for extension contact through local groups as avenues for optimizing local potential use in analog forestry.

II. LITERATURE REVIEW

2.1 The Role of Local Potential in Analog forestry Extension

(5) in their 'Analog forestry balancing nature and economy said that Outside expertise (for example a technician from an NGO) is often useful in helping farmers to analyze

their farm system and the original vegetation of the area. This involves drawing detailed maps of the farm area and surroundings, delineating existing and future land use, streams, soil conditions, etc. This exercise also gives farmers an opportunity to define their needs and objectives. Ideally the species chosen for planting should produce a range of products; mulch material, firewood, timber, fruits and medicines. It is also important to select a combination of species that can be harvested at different phases of the succession. Over time the farmers can introduce species with longer life cycles and higher demands. Following this a nursery for tree and plant species should be established, frequently in the form of a community arboretum. By using monitoring forms that track the progress of key indicator species, the different stages of the succession can be identified.

Many farm ecosystems are unbalanced and grossly dysfunctional (exhibiting salinity, acidification, erosion, nutrient depletion of soils etc.) principally due to the removal of the natural forest. The need for soil conservation and tree replacement is acknowledged by most land managers, yet few until recently have invested heavily in the reforestation of their properties. Analogue forestry is a means of re-establishing a forest (and its vital ecological functions) in a commercially productive system. Once established, Analogue Forestry can sustain the production of many commodities (from the herb, shrub and tree layers of the forest) and enhance stability due to the high biological diversity that is present. When this production system is built up in layers over successive years, the establishment costs for the next layer (e.g. shrub) can be offset by the sale of commodities from harvests of the previous layer (4).

(6) further impound saying that analogue Forestry fosters a polyculture system that spreads the risk of crop failure and market dependency for the individual farmer. This polyculture can be developed over several years with successive early crops offsetting the establishment costs of later ones. Markets for some organic 5-star quality herbs, cut-flowers and native foods are growing rapidly and can be a source of revenue during the early stages of forest establishment. Despite the high demand for these commodities, the selection and incorporation of early development crops into the design needs careful consideration. Some herb growers have suffered financially due to inappropriate choice and selection of crops and the decision to incorporate species for commodities must be strongly market driven.

III. RESULTS AND DISCUSSIONS

3.1 Local potentials of small-scale farmers that facilitate participatory analog forestry extension

The third objective of the study was aim at exploring the status of local potential among small-scale farmers towards participatory analog forestry extension for the purpose of analysis, three broad categories of local potential identified were: farmers indigenous knowledge, access to local resources that support the practice of analog forestry and finally extension contact opportunities. Through these potentials it was considered that analog forestry could be diversify and the needs and problems of small-scale farmers identified thus serving as future entry points for analog forestry growth. A series of factors were considered by the study:

i. The farmers indigenous knowledge on tree growing i.e. seedling production/collection and nursery management (selected species and why)
ii. Farmers resources that can support and facilitate the adoption of tree planting
iii. Other means that can harness local farmers potential and encourage external support

Farmers Indigenous Knowledge in Tree Growing and Uses

The study, revealed that farmers expressed diverse knowledge in tree growing and various uses. This was based on the pressing factor that have made the people to adopt the planting of particular trees in their communities; in the 6 different Divisions where the study took place, different tree species were planted by the farmers in their communities justified by the fact that they had different climatic conditions as well as different uses of the trees they plant in their farms. 53% of the farmers and 37% of the farmers groups plant trees that are food supplements and have water conservation characteristics while 24% and 8% plant trees that they have indigenous knowledge about and brought by the extension institutions.

It was also revealed by the extension agents (57%) that projects develop in the different communities had different objectives; for instance, CENDEP on designing project in the Donga Mantum Division, encouraged farmers to plant trees that will provide canopy for their main crop which was tea from drying out during the dry season. And on the other hand, projects that were designed and executed in the Mbven Sub Division were aimed at protecting water catchments and restoring the communal forest thus making the population to adopt the planting of trees that reduce transpiration and conserve much water.

However, the comparative understanding of the origin of knowledge as self may suggest that the knowledge on tree planting and use may not be entirely adopted by farmers the way it is. Consequently, there may be modification through cross-cultural exchanges and individual experimentation, issues well-articulated by (7) and a process that may require the recognition of the farmers' efforts. For instance, (8) reports a case where a farmer felt disgruntled by an extension worker who shared his diverse knowledge about growing passion fruits but was never acknowledged by the worker.

3.1.1 Local Knowledge on Tree Growing

To better understand the farmers' indigenous knowledge on tree planting and uses, the study was confined on two main areas of tree planting i.e. seedling production and tree management. Modern and conventional methods/scientifically proven methods were thus not considered as local methods hence eliminating institutional sources of knowledge. The results indicated that farmers possessed and had utilized a form of local knowledge in seedling production and tree management (Tables 24 and 25).

3.1.2 Indigenous Knowledge in Seedling Production

Study findings showed that farmers have devised different techniques for producing seedlings besides those procured from village nurseries (set up by the different institutions (Table 1).

Table 1: Farmers' use of indigenous Knowledge in Seedling Production

Knowledge Type	Seedling Production Technique	Frequency	Percentage
Propagation methods	- Transplanting of wildings		15.15%
	- Seed picking and planting	7	4.61%
	- Cuttings	12	7.89%
	- Direct seed planting	9	5.92%
Nursery management	- Use of animal manure	24	15.79%
	- Use of wood ash	15	9.87%
	- Fencing	26	17.11%
Seed treatment	- Soaking in water	8	5.26%
	- Fermenting	6	3.95%
	- Feeding animals with them	4	2.03%
	- Drying	16	10.53%

The local techniques for propagation of seedling as realized by the study were; use of wildings (transplanted) or retention of wildings, cuttings and direct seeding in the ratios 15.15%,4.61%.7.89% and 5.92% respectively.

Transplanted' wildings were mainly those of species, such as fruit trees like oranges cola nut, guavas, avocado plum and mangoes other exotic species planted purposely for wood and medicine and construction like; *Prunus africanna*, *Eucalyptus spp. and Podocarpus milanjianus.* Trees retained were those of indigenous species, such as, *Acacia spp. Vitex spp, Cordia spp* and *Croton spps.* The reason given for retaining these species is that, their seeds are easily dispersed and that raising the species using other methods is difficult. The same reason was also extended to transplanted wildings in situations where young seedlings were available under trees particularly in forest plantations after harvesting mature stands.

Additionally, where wildings occurred in a woodlot, they are transplanted to other areas deemed fit by the farmer sometimes as a management operation through thinning using the physiognomic formula of the remnant forest.

The findings indicated that 15.15% of the farmers had used transplanted wildings as a means of propagating seedlings either procured within the farm, or from external sources such as a friend, roadside or a nearby forest (see figure 19 below). Another 4.61% relied on retaining wildings as a means of raising seedlings. However, farmers indicated the problems related to seedling production through wildings as withering during transplanting or during cultivation and that not many trees or all species produced wildings.

Retained wildings were most affected by fire since the farmers still adopt the Ankara system which is the burning of maize stalks before cultivation or they are destroyed by wild fires and some even indicated that the continuous increase in the intensity of the sun greatly contribute in the dying of these seedlings. Overall, wildings were the most common local technique for raising seedlings. The Kayapo of Brazil, for example, are legendary for walking the forest with a small bag tied to their hip filled with seeds, which they plant when the conditions for successful germination are right (9).

Other local methods used by farmers for propagation were use of cuttings (7.89%) and direct seed planting (5.92%). Cuttings were mainly, *vocanga, and fick tree* used in the study area as a hedge around the homestead to serve both protective and aesthetic functions. Farmers indicated ease in establishing a hedge using this method. Direct seeding had been tried with *Acacia mearnsii* (black wattle). Remarkably, direct seeding through broadcasting of *Acacia mearnsii* seeds was followed with burning of the field. By doing so farmers interviewed indicated that burning would achieve faster and high germination rates.

Farmers also exhibited a grasp of seed pre-treatment requirements. For instance, 6 farmers revealed that fermentation of *prunus africanna* seeds by dipping them in a container with water for three to four days promotes the seeds viability when planted. Each seedling was sold at the cost of 250-500 FCFA; most group nurseries are increasingly raising this specie. Another example among the local techniques in seed pre-treatment was the feeding 'of goats with the seeds of *guavas* reported in one case. According to (10) in his study on the treatment of *Acacia tortilis* he confirmed that seeds could be better treated by feeding them to animals. The final method used by the farmers to treat seeds was through drying; this was done by exposing the seeds to sunlight too get dry before planting can take place. Example of such species included oranges, mangoes and even guavas for wild trees we had timber seeds.

With the concept of on-farm nurseries taking root, farmers have devised methods of reducing pests' attacks on nurseries. Pest control as part of nursery management measures can be expensive especially if synthetic chemicals have to be used. To cut down on expenses, farmers had used local methods such as improving the fertility of the soil with animal manure (15.79%), dusting the nursery with ash (9.87%) or fencing (17.11%). These were found effective in keeping the seedlings away from stray animals and insects. This contradicts the works of (11) who argued, that the majority of these smallholder plantings have limited success due to lack of integrated package of tree management practices.

To show a deep understanding of how farmers were aware of tree maintenance, it was realized that they did not just set their nurseries anywhere but usually selected a strategic place where near a spring source or deep inside the forest where it will be shaded away from the harsh sun and be readily supplied with water.

The study also revealed that despite these efforts by the farmers, they were still in desperate need of assistance and therefore were assisted by the institutions they were affiliated to with seeds, seedlings and nursery equipment like hoes, watering cans and wheelbarrows. This is true as Counterpart International was incorporated to address some of the most pressing needs to launch Analog Forestry on a global scale. Because project participants are usually poor rural farmers with extremely limited resources, even the smallest amount of capital investment may prove prohibitive unless significant benefits are guaranteed (12). With the additional input provided by local NGOs, Counterpart International and other aid organizations have established a platform for technical and financial assistance which provides project security by building on the needs of farmers and establishing long-term production goals.

I.1.3 Indigenous Knowledge in Tree Management

Farmers, identified some of the indigenous knowledge they have in tree management. The results are presented in table 2.

Table 2: Uses of Local indigenous Knowledge in Tree Management

Indigenous Knowledge Type	Tree Management Technique	Frequency	Percentage
Planting	- Manuring	18	11.82%
	- Delay in transplanting and planting within measured canopy distances	7	4.61%
	- Watering	24	15.79%
Weeding	Ring weeding	12	7.89%
Pest control	- using wood ash	16	10.53%
	- ring fencing	6	3.95%
Facilitating the coexistence between trees and crops	- pruning	13	8.55%
	- edge planting	11	7.24%
Fire tracing	- timely clearing	4	2.63%

The most common indigenous knowledge on tree management shown by the farmers was on tree planting. Farmers identified three planting management techniques that is manuring (11.82%), this is done using animal dropping (goat, sheep, cow, fowl) to improve the fertility of the soil and enhance the growth of the tree seedlings. To further guarantee the survival of the tree seedlings, the farmers delay from planting the tree seedlings when they are not yet mature or plant then at the heart of the rainy season that is from June to August. They also plant at a distance that will a distance that will facilitate the canopies of the trees to grow without congestion all of this was confirm by 4.61% of the farmers. Watering (15.79%), was also indicated as one of the management techniques use by the farmers to manage trees, this was based on the fact that at times the rains delay, or go too early when the seedlings are still young to survive the heat thus pushing the farmers to water.

This goes in line with the idea of (13) that the reason for this failure is due the fact that these projects "poorly define environmental problems, deploy poor conceptions of spatial scale, and propose untenable resource governance schemes for agro pastoral landscapes." As an example of how these projects may work, one such "buffer zone" project provides a nursery supplied with multiple-use trees seeds of which 60% are planted in the buffer zone according to the needs of the landholders. While this is a very participatory approach, there is no analysis as to What trees? Where? When? and Why? If this project is indicative of other similar projects, then it seems that implementation Analog Forestry concepts may be able to increase the ecological benefits.

The second indigenous knowledge identified by the farmers was weeding and the common management technique used by the farmers was to ring weed (7, 89%) round the seedling then pin trees around it to protect it from damage by stray animals. The third most common knowledge type in tree management was in the area of tree-crop interactions. Farmers reported pruning (pollarding) (3.8%) and edge planting (7.24%) as techniques to minimize negative tree-crop interactions. Pollarding was done to reduce the shading effect on crops by partial or selective cutting of the tree's crown.

Finally, farmers with *Eucalyptus spp.* have managed lateral roots of the trees to avoid unfavorable competition for resources with crops by sorting them out of their farms or the community or communal forest. Another technique use by farmers to facilitate growth between the trees and crops was by planting trees at the edge of their farms (7.24%); this, allowed amble space for crop production. The last indigenous knowledge showed by the farmers was fire tracing of the protected area or the plot where trees have been planted. This according to the farmers was done by clearing, trace burning or spraying with herbicides (2.63%) round the area. This therefore helps to protect the trees from bush fires in the peak of the dry season.

On the whole, the field performance of indigenous knowledge techniques mentioned above in tree planting and management, was rated as excellent (18.7%) by the farmers interviewed, good (12.5 %) and fair (2.3%). This point to the fact that the presence and use of local knowledge has immense potential in tree growing that should be tapped by extension agencies. Integrating modem science technologies can enhance the effectiveness of these practices. Sustainable

forestry has been practiced by traditional societies for thousands of years in many parts of the world. In the rural Amazon, for example, pre-Columbian societies outnumbered current Amazonian inhabitants, yet they managed to live within the forest ecosystem without causing massive losses of biodiversity or forest degradation (14)

3.1.4 Farmer's indigenous knowledge on Trees

(15) indicated that the choice of tree species to plant and manage depends largely on their uses to the farmer. In other to capture the true picture on the type of trees the farmers plant and their uses, farmers were asked to identify the tree species in other of preference and why they preferred it (table3).

Table 3: Trees preferred by farmers according to ranks

Tree Species	Type of specie	Ranks	Total Preferred Scores
Prunus africana	Exotic	1	23
oranges(Citrus sinensis)	Exotic	2	19
Cala nuts	Indigenous	3	17
Coffee rubusta	Exotic	4	14
Avocado spp	Exotic	5	14
Guavas pp(Psidium guajava)	Exotic	6	13
(Mangifera indica) mangoes	Exotic	7	13
Ilex meltis	Indigenous	8	12
Albizia	Indigenous	9	11
Polysia fulvia	Indigenous	10	11
Cordia	Indigenous	11	10
Croton macrost	Indigenous	12	8
Podocarpus manic	Indigenous	13	8
Kindzevi (cn)	Indigenous	14	6
Kirum (cn)	Indigenous	15	6
Sem (cn)	Indigenous	16	5
Vocanga	Indigenous	17	5
Carapa	Indigenous	18	5
Plum	Exotic	19	4
Melysia spp	Indigenous	20	4
Pitosporium spp	Indigenous	21	4
Vitex	Indigenous	22	2
Acacia	Indigenous	23	2
Lincot	Indigenous	24	1

From the study as shown in the table above, five of the top ten preferred species are fruits. Here, farmers identified that they been familiar with over 30 tree species, these species were ranked according to the total number of reference. To better get an understanding if the farmers have a mastery of the different tree types, they were asked to distinguish them according to native or exotic species. It was found out that the majority of trees planted by the farmers were mainly indigenous species and the majority of exotic species planted were mainly fruit trees and this is based on the fact that they are very economical as they act as sources of income to the farmers. Other farmers identified that difference in preference rating may be attributed to previous extension strategies, which promoted exotic species such as *Prunus Africana* among others.

According to the (16), other factors that have directly undermined preference of indigenous species are slow growth like lack of seeds and delay in economic returns.

It was also revealed that differences also existed in the reasons farmers gave for their preference of a species whether indigenous or exotic that were hinged on the various uses of the particular tree species (Table 4).

Table 4: Farmers' Responses on Uses of Different Tree Species

Tree Specie	Food	Income	Timber	Fire Wood	Medicinal	Fodder	Aesthetic	Water Conservation
Prunus africana	14	17	-	14	25	-	6	9
oranges(Citrus sinensis)	34	24	-	-	-	-	12	-
Cala nuts	23	33	-	12	-	-	-	-
Coffee rubusta	21	36	-	-	-	-	-	-
Avocado spp	27	35	-	11	-	-	-	-
Psidium guajava	16	27	-	-	-	-	-	-
Mangifera indica	11	23	-	-	8	-	6	-
Ilex meltis	-	-	-	-	23	-	2	4

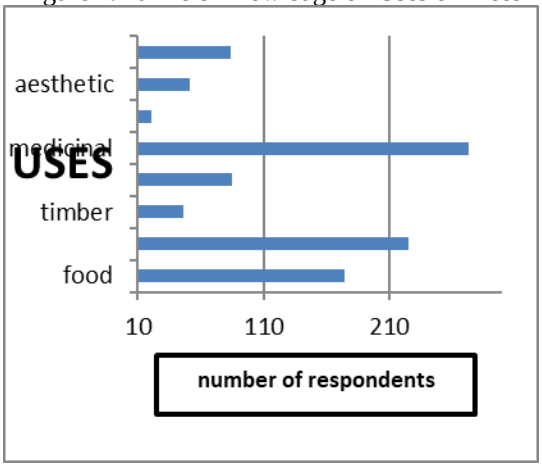
Albizia	-	-	-	-	17	-	-	8
Polysia fulvia	-	-	-	-	14	-	-	11
Cordia	-	-	-	11	18	-	-	-
Croton macrost	-	-	-	-	11	-	9	-
Podocarpus manic	-	-	-	6	22	-	-	-
Kindzevi (cn)	-	-	14	-	7	-	3	12
Kirum (cn)	-	-	8	11	-	-	-	-
Sem (cn)	-	-	6	4	23	-	-	-
Vocanga	-	-	-	-	27	-	8	5
Carapa procera	-	-	-	9	32	-	-	-
Plum	13	26	-	3	8	-	-	8
Melysia spp	-	-	7	-	-	-	-	-
Pitosporium spp	-	-	-	-	-	-	-	12
Vitex doniana	16	-	5	-	22	-	-	8
acacia mearnsii	-	-	6	4	17	21	5	7
Lincot	-	5	-	-	-	-	-	-

Different tree species had different uses as given by the fanners. These uses, in turn, greatly influenced the choice or preference of a particular tree species. Cross referencing with Table 24 above on preference ranking of tree species, *Prunus africana,* ranked' first, was preferred mainly because of the following uses: medicinal qualities, wood fuel, income and as a boundary maker. Majority of the trees use by the farmers were mostly medicinal. On the other hand, fruits were preferred mainly because of its use for they provide a good source of income and food.

The rest of the tree species were ranked basically owing to their peculiarity with regard to uses that the farmer felt they met. For instance, for *Acacia mearnsii,* preference was based on its uses as a wood fuel (mainly charcoal) provider and supplier of quality withes all being attributes that made it a good source of income. Apart from *Acacia spp.* (building / fencing poles, charcoal, and fodder) and *Croton megalocarpus* (fuel wood, and hedge) the remaining indigenous species namely, were listed mainly in the category of medicinal value.

In spite of low rating on preference, indigenous species were heavily represented in the special function category. Three categories of special functions of tree species identified in the survey were; human medicine, income and cultural food functions. Fig 1. summarizes overall local knowledge on tree uses.

Figure 1: Farmers Knowledge on Uses of Trees



Judging from the first three uses of trees which constitute to slightly more than half all the tree uses, the overriding concern in the choice of tree species were trees which provided medicine confirmed by over 220 participants, economic returns identified by 223 participants, and food (171) and those that offered minimal damage or supportive role to crops. This therefore indicates the need by extension agencies to promote tree species that reconcile these three overriding concerns.

3.1.5 Local Support Resources

Apart from knowledge in analog forestry, the study looked into the local support resources which farmers can utilize to support analog forestry. During the study, these resources were found to be locally available or within farmers' reach, partly utilized or could be utilized in future to support analog forestry.

In order to have better understanding of the support resources available, farmers were asked to present the costs incurred in tree growing and the mechanism they use to mitigated the costs or planned to mitigate them (5 and 6)

Table 5: Farmers Responds on Costs Incurred in Tree Growing and Management

Activities	Frequency	Percentages
Labor	7	4.61%
nursery equipment	23	15.13%
Polythene bags	5	3.29%
Buying of seedlings and seeds	17	11.18%
Transportation of seedlings	37	24.34%
Treatment o seedlings	8	5.26%

Farmers identified that they incurred the highest cost in the transportation of seedlings (24.34%), buying of nursery equipment (15.13%) like hoes, watering cans and wheelbarrows, however, it was indicated at times the affiliated institutions helped them with some of the equipment. The third highest expenditure was incurred in the buying of seedlings and seeds (11.18%) from fellow farmers or suppliers

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of seeds that come from the deepest parts of their communities where there is less competition or scramble for seeds and seedlings. The least incurred expenditures were gotten in seed treatment (5.26%), labor (4.61%) and buying of polythene bags 3.29%).this idea is supported by (17) that farmers lack detailed information about the type of crop (including tree crops), the harvest, and expenses incurred. In order to mitigate the costs above, farmers gave the following strategies given in Table 6.

Table 6: Mitigated measures use by farmers to overcome difficulties in tree planting and management.

Measure of mitigation	frequency	Percentage
Picking of seeds and seedlings from the wild	17	11.18%
Developing nurseries in their farms	24	15.79%
Applying for assistance from affiliated institutions	16	10.53%

Considering the challenges faced by the farmers above, they equally presented the following measures through which they have been able to mitigate those challenges. First, they indicated that to solve the problem of transportation of seedlings to their farms or community forest, they have set up their individual nurseries beside their farms and community nurseries beside their community/communal forest to solve that probe of transportation this was acknowledged by 15.79% of the farmers. Secondly, they have also tackled the problem of seeds and seedlings by doing the picking of seeds and seedlings by themselves from forest around their communities instead of buying this was confirm by 11.18% of the farmers. Finally, they have tackled other problems of equipment, polythene bags and even seeds and seedling by applying to assistance from affiliated institutions (10.53%).

This was acknowledged by extension workers, who added that they have been able to render assistance to the farmers by developing projects together with the communities and asking for sponsorship from partner organizations that sponsor such projects. Examples could be seen from CENDEP projects in the communities like; Restoration of degraded Montane forests in Cameroon, using analogue forestry techniques; sponsored by Netherlands Committee of the International Union for the Conservation of Nature (IUCN NL) and the restoration and protection of the Mbiame community watershed, North west Region Cameroon" sponsored by New England Biolabs Foundation.

One among the most important potential support resource in analog forestry considered by the study was income from trees and their products. The results indicated that some of the farmers had earned income at least from the sale of a tree or a tree product (Table 7).

Table 7: farmers respond on obtaining Income from the Sale of Trees and their Various Products

Tree products	Frequency	Percentage
Bark, leafs and stems of trees for medicinal purposes	37	24.34%
Wood	23	15.13%
Timber	15	9.87%
Seedlings and seeds	47	30.92%
Fruits	60	39.47%
Poles	8	5.26%
Fodder	12	7.89%

Among the most important income source from trees were; fruits (39.47%) from trees like oranges, mangoes, avocado, guavas and cola nuts. Sale of seeds and seedlings (30.47%) of the various trees, sales of barks, leafs and stems of trees like *Prunus africana* for medicinal purposes (24.34). firewood was also one of the products identified by the farmers as a very good source of income from their trees (15.13) confirm by the farmers and finally we had other products like timber for construction (9.87%), poles for fencing (5.26%) and fodder for animal feed (7.89%).

Further investigation on income, however, showed that the proceeds were adequate for 62%, inadequate for 14%, and negligible for 23% percent. According to (18), the situation is however; set to improve given that most tree species are still young as observed. The study, did not however authenticate that increase in income would raise investments or income ploughed back to analog forestry. Nevertheless, (19) contend that adoption of agro forestry first means putting money into the farmer's pockets. This, therefore, follows that farmers would be enticed to invest where they are certain of reaping benefits a situation that may avert the tendency by small-scale farmers to rely on crops or livestock as exclusive income sources.

IV. FARMERS GROUPS AND AFFILIATION TO INSTITUTIONS

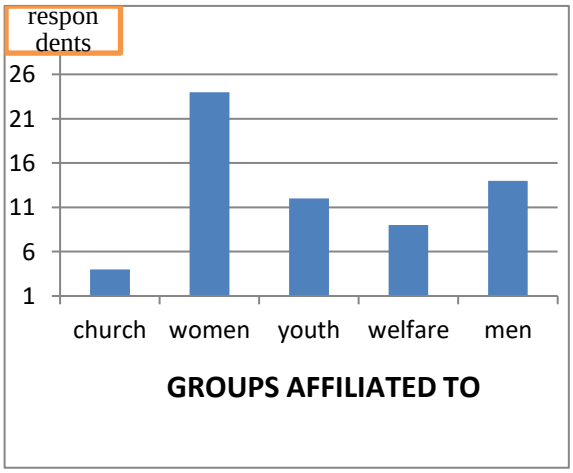
The study in other to establish the relation of farmers and the various institutions, went further to first to examine farmers affiliation to their groups and the activities that are mainly linked t the different groups;

Majority of farmers that belonged to local groups were engaged in analog forestry activities, mainly nursery development and management that appeared to be an activity carried by all the groups, fire tracing of communal and community forests, tree planting, bee farming and forest guiding that only appeared to be carried out by men groups. The farmers identified the various percentage as far as participation on analog forestry activities were concern based on the different categories; women groups (15.79%), men groups (9.21%), youth groups (7.89%), welfare groups (5.92%) and finally church groups (2.63%). This, made non-analog forestry activities to dominate the activities undertaken by these groups suggesting that these groups have not been fully used as forums to disseminate extension packages.

From the non-analog forestry activities identified by the farmers, dominating activities included fellowshipping an activity that was carried out by church groups with main activities including activities that promote conviviality. *njangi* that referred to an act of contributing money to support fellow group members to invest and pay gradually as interest accumulates. Cultural reasons mostly exhibited in women and

men groups, which help in the promotion of cultural values and customs. Burial arrangement, which was practiced in social welfare groups where members identified that bereaved members were assisted by all the members to bury their relatives. Support on livelihood was also another activity that was identify to be carried out by welfare groups like supporting members with seeds and other farm inputs. It was also identified that youth groups came together to promote their sporting activities and finally youth and groups came together support each other labor wise, i.e. in farming activities and construction. In conclusion, the farmers confirmed the following percentages as far as non analog forestry activities were concern; church groups (29.61%), women groups (13.82%),youth groups (11.18%), men groups (11.18%) and welfare groups (17.11%). Figure 2 summarizes overall group affiliation of farmers in the study area.

Figure 2: category of groups farmers were affiliated to



To further investigate if there is any disparity in gender as far as composition is concern in the various groups, the study brought in two sets of variables i.e. 'affiliation' and 'gender' and it was treated using Chi-square (X^2) test in a contingency (Table 8).

Table 8: Frequency of farmers Responses on Group Affiliated to Based on Gender

Gender	Group affiliation		
	In groups	Notin groups	Row total
Women	78	22	100
Men	24	28	52
Column total	102	50	152

Chi-square (X^2)	Degree of freedom	Critical value
15.71	1	3.841

Hypothesis testing: There is no gender-based disparities in opportunities for extension contact through local groups as avenues for optimizing local potential use in analog forestry

The results above were not significant at a 0.05 level, hence, suggesting that women had more tendency of being involved in group activities than men were. This greatly impacts the realization of participatory analog forestry extension at the level of the use of group approach. Since women continue to play a vital role as the dominant adopters of analog forestry, they are bound to be hindered by household problems that pull them from putting all their efforts. As confirmed by finding has far reaching effects in the realization of participatory extension especially in the use of group-based approach. Whereas women continue to play a special role as change agents and implementers of analog forestry. (20) confirm this by saying that rather, it's because of the combined effect of their daytime job together with their second job of managing the incessant responsibilities of household and family care. The challenge for extension agencies therefore remains to effectively target and encourage participation of men to ensure gender disparity to effectively disappear and parity realize the latent local potential in executing a participatory framework.

V. CONCLUSION

Conclusively, the study revealed that small scale farmers have indigenous knowledge in tree planting, management and uses. With this knowledge, farmers have been able to easily adopt analog forestry innovation techniques in the six Divisions where analog forestry has been disseminated. Findings, further confirmed that there is a tendency that women turn to be more participatory in extension activities more than men and are more likely to adopt analog forestry innovation ore than men. The challenge for extension agencies therefore remains to effectively target and encourage participation of men to ensure gender disparity to effectively disappear and parity realize the latent local potential in executing a participatory framework.

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