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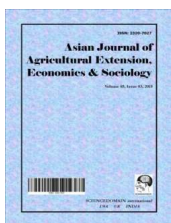
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## **Access and Use of Agricultural Extension Information and Services by Rural Women in Cameroon**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author FDE designed the study, wrote the protocol and supervised the work. Authors FDE and MIN carried out all laboratories work and performed the statistical analysis. Authors FDE and MIN managed the analyses of the study. Author FDE wrote the first draft of the manuscript. Authors FDE and MIN managed the literature searches and edited the manuscript. Both authors read and approved the final manuscript.*

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### **ABSTRACT**

This study examines the role of rural women in arable small-scale sustainable agricultural production in a developing country setting. Specifically, the study addresses rural women's level of accessibility and use of agricultural production resources in the North West Region of Cameroon. The objectives are to determine the extent to which rural women obtain and use agricultural extension information and/or services; and to assess the relationship between rural women's access to and their use of agricultural extension information and /or services. The study relies on a one-shot case study design. Data collection consisted of surveying a randomly selected sample of 1,120 rural women involved in small-scale agricultural production. The data was analyzed using univariate descriptive analysis, Pearson correlation analysis, and one-way analysis of variance.

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Results show that a majority of the rural women do not have access to and hence do not use agricultural extension information and/or services. There is a strong positive correlation between access to and use of agricultural extension information and/or services. Consideration in formulating and adopting agricultural policies that include rural women in decision-making, implementation, and evaluation of agricultural inputs and yields have been proposed for developing countries involved in subsistence agriculture.

*Keywords: Agricultural extension information; rural women; access; use; agricultural services.*

## 1. INTRODUCTION

In all regions of the world, poverty and household food insecurity are more prevalent and severe in rural than urban areas [1]. A large majority (80 percent) of the population of Sub Sahara Africa live in rural areas, and 70 percent of rural populations are dependent on food production through small-scale farming or livestock rearing for their livelihood [2]. In Cameroon, like other tropical African countries, it is mainly the small-scale subsistent farmers who grow food crops for domestic consumption even though some crops are sold to meet other household needs.

Rural women in Cameroon, like in other African countries, are confronted with formidable obstacles in their role as the major economic and social force in the development of the agricultural sector in their countries [3]. Programs in the agricultural sector generally tend to overlook and ignore women [4]. Extension systems usually reach out to male heads of households, or concentrate on export crops such as cocoa, coffee and oil palms, but seldom on food crops such as beans, cowpeas, millet and groundnuts that are grown by women. Furthermore, agricultural production is presented as a male occupation, and when women are given any recognition, they are depicted as 'helpers', wives, mothers or daughters.

Rural women are not always considered in agricultural research, development program or improved technology [5,6]. According to FAO [5] the old system imposes a gender division of labour that assigns women into the most tedious, labour intensive and poorly rewarded task or assignment with limitations on resource accessibility. The application of obsolete technology in agriculture tends to increase the drudgery for some of the rural women who live in abject poverty without necessarily increasing their gains.

Indications are that women's involvement in agricultural labour is under-reported and their participation in food production and related

activities are often characterized by the application of rudimentary technology, such as the hoe and cutlass. In spite of the significant role women play in agriculture, the traditional image of a typical farmer as "male" still persists [7,8].

Notwithstanding the African women's important role in agricultural production, agricultural projects by design or default, ignores them in the allocation of extension information and services, inputs and credit [9,10]. According to these authors the lack of women's contribution to agricultural development programs appears to be as a result of their dependent status as additional caretakers of homes and children, and as service providers. The unfavourable treatment accorded women by aid programmers reflects the conventional institutionalization of women as keepers of homes and men as breadwinners [11]. These attributes conceal women's contributions to the household and community. The perception of women as non-agricultural producers keeps them invisible to the agricultural policy planners [12].

Small-scale agricultural food production is the major activity of rural women and their responsibilities and labour inputs in this area often exceed those of men in most of Africa [13]. Unfortunately, African planners and policy makers, tend to ignore the role of women in the agricultural food production, and little attempt is made to better educate, enlighten, train and reward women for their involvement in agricultural food production activities [14].

Technical training and extension programs are almost exclusively targeted at men who are the heads of household, thereby denying women the opportunities to either improve their farming skills, or gain access to important sources of state-sponsored support services available to enhance rural households' food production. For the most part, agricultural research has focused on cash crops and other major staples that are largely dominated by male farmers, and consequently ignored the key role played by

women in achieving food sufficiency through food crop production and selection. Consequently, women farmers have not benefited from agricultural development programs. A result of the greater emphasis on cash crops is that men who grow these cash crops allocate more of the basic inputs (hoes, cutlasses, and female labour) to their farms. This subordination of females by men in agricultural resource use makes women's responsibility to feed the family difficult and diminishes female opportunities to generate marketable surplus [15].

Although women produce 80-90 percent of the food grown for domestic consumption, inputs such as fertilizers, seeds, and credit facilities are channelled to men [16]. Traditionally, women are often marginalized from loan guarantees unless they are represented by their spouse or a male relative in the loan application process, and as a result have found it difficult to obtain financial assistance needed to boost their production and crop selection [17]. Despite the predominance of women in agricultural production researchers, administrators, and planners hardly pay attention to them and their roles in rural society, [18,19]. As a consequence agricultural programs developed to alleviate poverty instead worsen their problems [20].

Although women play a very active role in agricultural development, their position in African countries does not reflect their contributions. Therefore, when policies are made, their impact on women is rarely taken into consideration. It appears that there is a general absence of intelligent and well thought out policies regarding rural women. For instance, many scholars have noted that countries such as Bangladesh, India, Sri Lanka, and Pakistan have documented the conspicuous lack of policy response to rural women's needs and concerns.

Therefore, enhancing women's status in agriculture and rural society would not only go a long way toward overcoming population and food production problems, but it would also help to boost economic growth and development [21]. The key for ensuring food self-sufficiency generally in Africa and Cameroon, in particular, is by recognizing rural women's involvement in agricultural food production and to reflect the value of their role in policy formulation. Agricultural development plays a role in rural poverty alleviation since the majority of the rural poor depend upon agricultural production for income generation and employment opportunities. Much evidence about previous

generations has been lost, and reliance has been on anecdotal accounts. More importantly, the World Bank research findings on the Africa Region for 1995 indicated that Agricultural Service Projects focused initially on establishing national programs based on Training and Visit (T & V) management principles. However, with the second generation of these projects, increased knowledge and systematic documentation of the current and changing roles of women in agricultural production are necessary to improve the targeting of project activities. Thus, there is a need for the documentation of the role of rural women in agricultural food production and particularly the extent to which they obtain and use agricultural extension information and services. This is because the extent of positive change on the productivity of rural women will depend on their access and use of agricultural extension information and/or services.

The objectives of this study are to determine the extent to which the rural women in the North West Region of Cameroon access and use agricultural extension information and/or services, and to find out if an association exist between the two. The hypothesis is that there is no correlation between the acquisition and application of agricultural extension information and/or services by rural women.

## **2. METHODOLOGY**

### **2.1 Sampling**

Rural women involved in arable agriculture in the North West Region of Cameroon made up the population of study and the rural woman was the unit of analysis who participated in the study. Cross sectional data were collected and analyzed from random sample of 1,118 rural women. The survey instrument was developed in line with the objectives and given to three persons in the domain for validation and corrections made were incorporated before the questionnaire was pretested.

### **2.2 Data Collection and Analysis**

Data for the study were obtained from rural women farmers of the study area using a set of structured and pre-tested questionnaires. Both open and close-ended questions were used in the study. The technique of data collection was reactive. The low level of literacy of rural women or farmers fluent in their mother tongues promoted the need for assistance of female enumerators to help in the administration of the

questionnaires. Well-trained indigenous females from the study area assisted in the data collection to avoid language barrier, cultural norms violation and to ensure that the women would feel more comfortable answering the questions sincerely to someone who is of their gender. Statistical techniques and procedures used included frequency distribution, correlation analysis, and one way analysis of variance (ANOVA).

### 3. RESULTS AND DISCUSSION

#### 3.1 Rural Women's Access to Agricultural Extension Information and/or Services

Information is an essential production factor in agriculture. The new techniques or innovations (high yielding and disease resistant seeds) from the researchers' desk will be nullified if these are not accessible and used by the concerned farmers in general and rural women in particular. Farmers need relevant and timely information to improve their yields and farm income [19]. There exist many communication channels (formal and informal) through which rural women farmers receive advice on agricultural production issues. These channels include; agricultural extension agent, friend, relative, meeting house, and church. Pieces of information and/or services passed on are geared toward acquiring new production techniques or improving on existing farming techniques or practices.

Rural women's opinion about their level of access to agricultural extension information and/or services in the North West Region of Cameroon is presented in Table 1.

**Table 1. Extent of rural women's access to agricultural extension information and/or services**

		Frequency	Percent
Valid	No extent at all	75	6.7
	No extent	514	46.0
	To some extent	450	40.3
	To an extent	78	7.0
	To a great extent	1	.1
	Total	1118	100.0

The table indicates that more than half (52.7%) of the women were of the opinion that they did not have access to extension information and/or

services. Hence, it can be concluded that most rural women do not have access to agricultural extension information and/or services.

Table 2 presents the extent to which the respondents have access to agricultural extension information and/or services. It also displays the Bonferroni multiple comparison test on the extent to the respondents have access to agricultural extension information and/or services from various sources.

Meeting house as a communication channel of accessing arable small-scale agricultural extension information and/or services came in the first position with a mean score of 3.28. Access to agricultural extension information and/or services from a friend was second with a mean score of 2.91; in third place was from an agricultural extension agent with a mean score of 2.84; from a relative with a mean score of 2.81 came in fourth place; and lastly was from a church with a mean score of 2.53. Bonferroni multiple comparison test showed that the mean difference between the various sources of agricultural extension information and /or services were not found to be statistically significant at five percent level of probability. The table showed that there is no statistically significant mean difference at the 0.05 alpha levels between the extent to which rural women have access to agricultural extension information and/or services from an agricultural extension agent and from a friend, an agricultural extension agent and a relative, and from a friend and from a relative. It can be inferred from Table 2 that rural women in the North West Region obtain information mostly from meeting houses.

#### 3.2 Rural Women's Use of Arable Small-Scale Sustainable Agricultural Extension Information and/or Services

Table 3 shows the results of rural women's opinion about the degree to which they used agricultural extension information and/or services in the North West Region of Cameroon. The results suggest that a majority of the women (52%) were of the opinion that they did not use agricultural extension information and/or services. Hence, it can be concluded that a majority of rural women of the study area do not use agricultural extension information and/or services.

Since rural women are resource poor farmers, this falls in line with Navarro (2006) ideas that only farmers with resources process information.

Table 4 shows the result of the analysis of variance and the Bonferroni multiple comparison test on the extent to which rural women use agricultural extension information and/or services.

The mean score for the extent to which rural women use arable small-scale agricultural extension information and/or services from a meeting house was found to be the highest (3.30); followed by agricultural extension agent (3.06); friend (2.97) relative (2.82), and church (2.53). Bonferroni multiple comparisons test showed that the mean difference between the use of agricultural extension information and/or services accessed from the various sources with the exception of agricultural extension agent and friend were found to be statistically significant at the 0.05 alpha levels.

Hence, it can be concluded that most rural women in the North West used agricultural

extension information and/or services from meeting house.

### 3.3 Relationship between Rural Women's Access to and Use of Small-Scale Sustainable Agricultural Extension Information and/or Services

The relationship between rural women's access to agricultural extension information and/or services and use of agricultural extension information and/or services was investigated. The test of the hypothesis of the relationship between rural women farmers' access to agricultural extension information and/or services and use of agricultural extension information and/or services was performed. The results of the correlation analysis of the relationship between rural women's access to and use of agricultural extension information and/or services are presented in Table 5.

**Table 2. Rural women's access to agricultural extension information and/or services**

	N	Mean	Std. deviation	Std. error
Agric. extension agent	1118	2.84	1.060	.032
Friend	1118	2.91	.774	.023
Relative	1118	2.81	.845	.025
Meeting house	1118	3.28	.950	.028
Church	1118	2.53	1.270	.038
Total	5590	2.87	1.023	.014

**Bonferroni multiple comparison test on the extent to which rural women have access to agricultural extension information and/or services from various sources**

(I) Agric ext. information and/or services	(J) Agric ext. information and/or services	Mean difference (I-J)	Std. error	Sig.
Agric ext. agent	Friend	-.068	.042	1.000
	Relative	.028	.042	1.000
	Church	.316(*)	.042	.000
Friend	Agric. ext agent	.068	.042	1.000
	Relative	.096	.042	.230
	Meeting house	-.367(*)	.042	.000
Relative	Church	.384(*)	.042	.000
	Agric ext agent	-.028	.042	1.000
	Friend	-.096	.042	.230
Meeting house	Meeting house	-.462(*)	.042	.000
	Church	.288(*)	.042	.000
	Agric ext. agent	.435(*)	.042	.000
Church	Friend	.367(*)	.042	.000
	Relative	.462(*)	.042	.000
	Church	.750(*)	.042	.000
Church	Agric ext agent	-.316(*)	.042	.000
	Friend	-.384(*)	.042	.000
	Relative	-.288(*)	.042	.000
	Meeting house	-.750(*)	.042	.000

\* The mean difference is significant at the .05 level

**Table 3. Extent to which rural women use agricultural extension information and/or services**

		Frequency	Percent
Valid	No extent at all	65	5.8
	No extent	515	46.1
	To some extent	438	39.2
	To an extent	99	8.9
	To a great extent	1	.1
	Total	1118	100.0

**Table 4. One way analysis of variance for the extent to which rural women use agricultural extension information and/or services**

	N	Mean	Std. deviation	Std. error
Agric. extension agent	1118	3.06	1.185	.035
Friend	1118	2.97	.737	.022
Relative	1118	2.82	.799	.024
Meeting house	1118	3.30	.891	.027
Church	1118	2.53	1.273	.038
Total	5590	2.94	1.032	.014

**Bonferroni multiple comparison test for the extent to which rural women use agricultural extension information and/or services**

(I) Agric ext. information and/or services	(J) Agric ext. information and/or services	Mean difference (I-J)	Std. error	Sig.
Agric ext. agent	Friend	.092	.042	.294
	Relative	.240(*)	.042	.000
	Meeting house	-.241(*)	.042	.000
	Church	.533(*)	.042	.000
Friend	Agric. ext. agent	-.092	.042	.294
	Relative	.148(*)	.042	.005
	Meeting house	-.333(*)	.042	.000
	Church	.441(*)	.042	.000
Relative	Agric ext. agent	-.240(*)	.042	.000
	Friend	-.148(*)	.042	.005
	Meeting house	-.480(*)	.042	.000
	Church	.293(*)	.042	.000
Meeting house	Agric ext. agent	.241(*)	.042	.000
	Friend	.333(*)	.042	.000
	Relative	.480(*)	.042	.000
	Church	.774(*)	.042	.000
Church	Agric ext. agent	-.533(*)	.042	.000
	Friend	-.441(*)	.042	.000
	Relative	-.293(*)	.042	.000
	Meeting house	-.774(*)	.042	.000

\* The mean difference is significant at the .05 level

The data in this table indicates that the mean score of access to agricultural extension information and/or services is 26.58, while the mean score for the use of agricultural extension information and/or services is 14.58. The corresponding correlation between the two variables shows a Pearson correlation of 0.825 and a corresponding p-value of 0.000 (two-tailed test at 0.01 significance level), suggesting a strong statistically significant positive correlation between the two variables.

From these results, the null hypothesis is rejected, and it can therefore be concluded that there is a strong relationship between access to agricultural extension information and/or services

and use of agricultural extension information and/or services by rural women in the North West Region of Cameroon.

The findings of a strong statistically significant positive relationship between rural women's access to and use of agricultural extension information and/or services in arable agriculture proves that, access to agricultural extension information and/or services has a great influence on the use of agricultural extension information and/or services by rural women in arable small-scale sustainable agriculture. The more rural women accessed agricultural extension information and/or services, the more they used such information and/or services.

**Table 5. The relationship between rural women's access to agricultural extension information/or services and use of agricultural extension information and/or services descriptive statistics**

		Mean	Std. deviation	N
Average score for access to agric information and service		26.58	5.769	1118
Average score of extent of agric information and service use		14.58	3.386	1118

Correlations			
		Average score for access to agric information and services – index	Average score for use of agric information and/or service use
Average score for access to agric information and services – index	Pearson correlation	1	.825(**)
	Sig. (2-tailed)	.	.000
	Sum of squares and Cross-products	37172.093	17999.512
	Covariance	33.279	16.114
	N	1118	1118
Average score of extent of agric information and service use	Pearson correlation	.825(**)	1
	Sig. (2-tailed)	.000	.
	Sum of squares and cross-products covariance	17999.512	12809.929
		16.114	11.468
	N	1118	1118

*\*\*Correlation is significant at the 0.01 level (two-tailed)*

Based on the findings of the extent of access to and use of agricultural extension information and/or services, it could be argued that agricultural extension agents could lose the confidence of rural women farmers due to lack of proper communication skills and This is particularly true as according to Navarro [22] and Fon [10] agricultural and extension educators can be central in supporting scientists and policy makers in performing needs assessments, engaging in continued dialogue with intended beneficiaries, building on indigenous knowledge and resources, developing appropriate changes, and maintaining focus in issues that might otherwise be forgotten for example cultural conservation.

It is assumed that rural women farmers' access to agricultural extension information and/or services and their ability to understand the message depended on education. Moreover, because most rural women farmers in the study area are illiterate, they have a lower capacity to respond to written extension materials. The results of this study can be generalised to developing countries involved in arable small-

scale agricultural production with rural women having similar characteristics like the study group.

#### 4. CONCLUSION AND POLICY RECOMMENDATION

The issue of rural women is critical to future development initiative, discourse, and rational strategies on women's role and their involvement in agricultural production and care giving. Women assume a decisive role in agricultural food crop production that is likely to have a lasting effect on poverty reduction and on a nation's health and nutrition. Increasing access to essential agricultural production information and services requires attention to policy changes. Agricultural policies in agrarian economies are not always fully attuned to ensuring that agricultural extension information and/or services are available, accessible, or appropriate. Solutions must begin with an understanding of local agricultural conditions. Access to agricultural extension information and or services cannot be addressed in isolation from the rest of the agricultural system. Access to



agricultural extension information and/services is not an issue that exists in a vacuum, but an integral part of agricultural production. There should be a farmer participation approach to agricultural development rather than their mere involvement in decision-making, implementation, and evaluation. This is critical due to their experiences and proximity to the many challenges afforded by the environment.

Factors of production are still controlled by men, despite their increasing absence from the rural areas (countryside). Development planners assume that information given to male farmers will be passed on to other farming members of the household. Experience indicates that agricultural knowledge acquired by men, unless they themselves are the beneficiaries, often does not trickle "across" effectively to women in the family. Men are less likely to pass information on to women when crops or tasks are gender-specific.

The Parliament should legislate policy, whereby agricultural extension information and/or services go to rural women farmers and a reward program, whereby individual rural women, who focus on agriculture, are supported and helped to acquire necessary agricultural inputs to enhance agricultural output. This is commensurate with provision of subsidies to farmers in developed countries.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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