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# The Synergy Between Indigenous Learning Methods and Extension Methods in Agriculture in the Fielmuo Traditional Area, Upper West Region of Ghana

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**Abstract**
This study investigated how socio-economic factors influence the acquisition of indigenous knowledge and how extension system adapt its teaching methods to the indigenous learning methods of rural farmers in the Fielmuo Traditional Area in the Upper West Region. The study which was a descriptive survey was carried out in the Fielmuo Traditional Area where five communities were randomly selected. Information was collected from hundred farmers and six Agricultural Extension Agents who were also randomly selected using interview schedule. Key informants interview was also used to collect additional relevant information from ten knowledgeable elderly farmers who were not part of the target population. Data were analyzed into frequency counts, percentages, means and Chi Square test using SPSS software (version 16.0 for Windows). Socio-economic factors such as age, sex, education and religion were investigated and it was proven that there was no significant difference ($p > 0.05$) between age and amount of knowledge acquired on the cultural practices and between education and the cultural practices. There was however, a significant difference between sex and knowledge acquisition on singing of dirges, playing of drums and xylophone ($p < 0.05$). There was no significant difference between religion and indigenous knowledge acquisition ($p > 0.05$). The study also revealed that there was a weak relationship between extension teaching methods and indigenous learning methods.
**Keywords:** Socio-economic, tacit knowledge, xylophone, proverbs, community

## 1. Introduction

The agricultural sector is the backbone of many economies in Africa. *In Ghana the agricultural sector holds the key to food security as it engages approximately 60% of the labour force and contributes about thirty-seven (37%), the largest, to the Gross Domestic Product (*Aggrey-Fynn & Akpabi, 2005*)*. However, the agricultural sector in Ghana is sustained by aboriginal societies located in the rural parts of the country. Each of these societies has a culture which is preserved and transmitted from generation to generation through education as knowledge. These societies over the years have developed and sustained their own unique cultural or indigenous knowledge learning systems. This indigenous knowledge (IK) has become the cornerstone for the cultural identity and source of survival, most especially agriculture, for these indigenous people.

Indigenous knowledge (IK) which is a unique local knowledge is made up of ideas, beliefs, values, norms, and rituals, which are native and embedded in the minds of people. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities (Warren, 1991). Indigenous knowledge is relevant as it constitutes an important source of innovation and skills which can be used and developed for improving agricultural production and upgrading poor peoples' livelihood in rural development processes (Thrupp, 1989). This is because being a cultural-based knowledge, indigenous knowledge can be effective, efficient and functional in Agricultural knowledge transfer since agriculture constitutes the major occupation of the indigenous people; the reason why agricultural extension, as an organization, has so much influence on the lives of indigenous people. Additionally, indigenous knowledge is an important part of the lives of the poor. It is an integral part of the local ecosystem. IK is a key element of the "social capital" of the poor; their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives. Indigenous knowledge is a valuable resource for decision making, policy planning, agriculture, poverty alleviation, health care, food preparation, education, and a host of other activities in communities (Tripathi & Bhattarya, 2004).

Rural people attach importance to the learning of Indigenous knowledge as they see it as a community resource that is proven and timeless. It brings the community together and provides strength to the communities' culture. Learning usually begins at two to five years when the child begins to acquire knowledge on the names and characteristics of common biota, and attaining some amount of competent at the age of fourteen (14) in household tasks, cultivation (plant identification, harvesting), seed selection, weeding, animal husbandry, fishing, and hunting. According to Millar (1996) the family usually constitutes the environment where indigenous teaching and learning begin and take place among the Dagara. "Wulu" (tutelage) in agriculture is a protracted period of apprenticeship and covers all ages and therefore spans for an unlimited period. Learning is more

vertical (learning from the elderly) than horizontal (learning from peers).

Extension education is the primary process through which the farmers can learn the reason for change, the value of change, and the results that can be achieved through change. Extension is a type of education that is functional rather than formal and its main task is to convey meaningful information to the farmers. It is the major source to make farmers aware of alternatives from where they can choose the most desirable as well as how the different methods that exist for carrying out their farming and other operations (Okunade, 2007). Extension involves the conscious communication of information to help people form sound opinions and make good decisions. So in an attempt to influence indigenous people who are mostly farmers to adopt and use new technologies with the view to improving upon their livelihood, various teaching methods are used. These methods, described as tools, are used by the extension workers/agents to achieve set goals or objectives as teachers. They are special tools needed to appeal to the desire of farmers to change. Extension methods include individual, group and mass methods (Okunade, 2007). The introduction and use of modern knowledge, particularly Extension education, into agricultural production in Ghana to improve the plight of rural farmers, has relegated indigenous knowledge to the background because it is often regarded as backward and superstitious (Reijntjes, Haverkort, & Waters-Bayer, 1992).

However, indigenous knowledge has the capacity to contribute to the effectiveness and sustainability of the development process because local farmers have the necessary capacity to take decisions regarding development as they always produce evidence-based knowledge. The elders who are the custodians of indigenous knowledge use several methods to ensure the transfer of indigenous knowledge from generation to generation and one of the major ways used to transfer knowledge is the use of social capital, which enable experts to demonstrate skills and farming practices to apprentices (Moyo, 2010). This explains why it is difficult to influence local farmers to side-line Indigenous knowledge because it is developed based on empirical evidence from 'experimentation' and observation made by the farmers.

## 2. Statement of the problem

Despite the overwhelming potential of IK in agricultural development, it is often not accorded the same recognition as conventional knowledge and consequently traditional farmers are not recognised as formal sources of knowledge in developing countries (Kilongozi, Kengera & Leshongo, 2005), Ghana inclusive. This may be due to the fact that IK is tacit and transmitted through oral tradition and demonstration and stored in the minds of individuals.

Again, rural people attach much importance to the learning of Indigenous knowledge as they see it as a community asset. Therefore, recognizing, utilizing and managing this knowledge has a big impact in achieving development objectives (Bhatnagar, 2000). But development institutions including Agricultural Extension more often down play the efficacy of indigenous knowledge and its learning methods.

Socio-economic factors such as age, gender, religion and education impact positively or negatively on indigenous knowledge acquisition. The younger generation is often encourage to shy away from their culture, indigenous practices and traditional ways of managing natural resources because of formal education (Van Camp, 2007). Religion has a deep influence on rural farmers with regards to the type of crops they cultivate, how they process and store the crops, the type of animals they keep, how they cook their foods, how they contract their marriages, carry out their festivals, their dance, music, dressing and many others. Also, in this present era of technology push, the tendency to ignore or underestimate indigenous knowledge, practices and indigenous knowledge learning methods by research, extension services organization and development agencies has severely affected farmers' livelihood in the rural communities Upadhyaya, (2004). The end result is low patronage of innovations by farmers because they are not given the opportunity to apprehend things their own way. Hence, the need for creating space for indigenous forms of learning to find expression in, particular, the methods that are used by extension in learning situations before sustainability can be contemplated (Millar, 1996).

## 3. Justification

The neglect of farmers' tacit knowledge by extension experts has contributed immensely to the negative impact associated with extension services (Roling, 1992). Extension experts should always be reminded of the fact that farmers' tacit knowledge is the bedrock in the search for new knowledge for farming. Because indigenous practices are closely interwoven with people's cultural values and problem solving strategies among the local communities, passed down from generation to generation.

IK is a significant resource that can ensure efficiency, effectiveness and sustainable development process. It is a tool for community level decision making regarding food security, human and animal health and other vital economic and social activities. Therefore, any development approach without indigenous knowledge can only be seen as a centralised, technically oriented solutions to people deemed to have no choice which cannot change the life prospects for a majority of the peasants and small farmers in any community because it makes no economic

sense and not culturally acceptable (Briggs, 2005). This is because IK is the knowledge that people in a given community have developed overtime, and continues to develop based on experience which is often tested over centuries of use and adapted to local culture and environment. The people have an intimate knowledge of many aspects of their surroundings and their daily lives (Atoma, 2011).

Indigenous knowledge helps rural communities make decisions about activities, such as agriculture, environmental sustainability and education that are acceptable to their way of lives. Indigenous knowledge, along with western- based knowledge, helps create development solutions that are culturally acceptable to the society being helped, thus Indigenous knowledge help find the best solution to a development solutions, assists extensionists and researchers understand and communicate better with local people and it represents the successful ways in which people have dealt with their environments (Puffer, 1995).

Tutelage of indigenous knowledge is done using symbols, rituals, proverbs, riddles, stories and songs and learning is done by imitation, observation, trial and error, listening and practice, and others. Hence, extension services to farmers can achieve more when indigenous knowledge and its learning methods are giving priority in the agricultural development activities. Thus, to promote the participation of farmers in developmental projects (Rajasekaran, Martin, & Warren, 1993) the agricultural teaching methods must be adapted to the indigenous knowledge learning methods of the people.

The failure to normally situate knowledge transmission within the context in which the knowledge would be acquired and applied accounts for the fact that attempts by both government and Non-Governmental Organizations to empower rural communities through dialogue and meaningful communication is still problematic as intervention strategies developed to respond to the needs of rural farmers in agricultural development have suffered various setbacks in northern Ghana.

This study was therefore carried out to examine how the extension system adapt its teaching methods to the indigenous learning methods of rural farmers. Specifically, it was to:

- Assess how socio-economic factors influence the acquisition of indigenous knowledge of rural people.
- determine how extension teaching methods are adapted to the learning methods of farmers

## 4. Methodology

This study was a descriptive survey carried out to investigate the level of compatibility between agricultural extension methods and indigenous knowledge learning methods among farmers within the Fielmuo Traditional area under Sisaala West District of the Upper West Region of Ghana. Five communities were selected for the study: Fielmuo/Gaaper, Liero, Kankanduele, Buo and Kuochuur. The study area was purposively selected for purposes of convenience in terms of communication and location, and the five communities and the farmers randomly sampled to ensure that each community and farmer had an equal chance of being selected.

The target population included all farmer groups within the Fielmuo traditional area who had access to extension services from Ministry of Food and Agriculture. Five farmer groups, one from each community, were involved in the study. In all, data were collected from hundred 100 farmers in the five groups and six (6) Agricultural Extension Agents (AEAs) who were in the district office. Key informants interview was also used to collect additional relevant information from knowledgeable elderly farmers who were not part of the target population. In all ten key informants were purposively selected, two from each of the five communities.

Questionnaire which was used as the major tool for data collection consisted of both closed and open ended questions as well as items of likert scale format. For easy interpretation of the results, the data were analyzed into frequency counts, percentages, means and Chi Square test using SPSS software (version 16.0 for Windows).

## Results and Discussions

**Research Question** 1: **To what extent do socio-economic factors influence the acquisition of indigenous knowledge of rural people?**

## 5. Personal Characteristics and Indigenous Knowledge Acquisition

Personal characteristics such as age, sex, religion and education and how they affect indigenous knowledge acquisition are discussed here. However, for easy assessment of how age, sex, religion and educational level relate to the amount of knowledge acquired by respondents the responses were categorized into “low” and “high”. That is, very low and low became “low” and “high” included moderate, high and very high.

### 5.1. Indigenous knowledge of respondents by distribution by Age

In many instances, two to five year old children begins to acquire indigenous knowledge on the names and characteristics of common items. By the age of fourteen (14), they are competent in household tasks, cultivation (plant identification, harvesting), seed selection, weeding, animal husbandry, fishing, and hunting. The acquisition of indigenous knowledge starts at a very early age because, perhaps, it is passed on orally, usually by word of mouth and cultural rituals.

In view of this, the ages of respondents were taken to find out the amount of indigenous knowledge they had accumulated at the time of the data collection. The age distribution of respondents ranged from 23 years to 80 years, while the mean age of respondents was 50 years. The ages of respondents were then also regrouped into 20-40, 41-60 and 61-80 to ensure easy determination of statistical analysis.

With this regrouping it was realized that majority of the respondents fell within the category of 41-60, comprising of 55% of the total respondents. The elderly who are mostly less active in farming activities fell within the age category of 61-80, constituting 19% of the respondents. They are usually the custodians of indigenous knowledge and wisdom, and always available for consultation and mediate in family problems. Twenty-six percent (26%) of the respondents fell in the age category of 20-40 far less than those within 41-60 age category. The 20-40 age category were those who mostly travel down south, especially during the dry season, in search of menial jobs or to settle there to farm. This might have accounted for the smaller number in that age group because the study was conducted during the dry season, a time that most of them traveled down south. In total, 81% of the respondents fall within the economically active group. According to the 2000 population and housing census 15-64 years constitute the economically active group in Ghana (Figure 1).

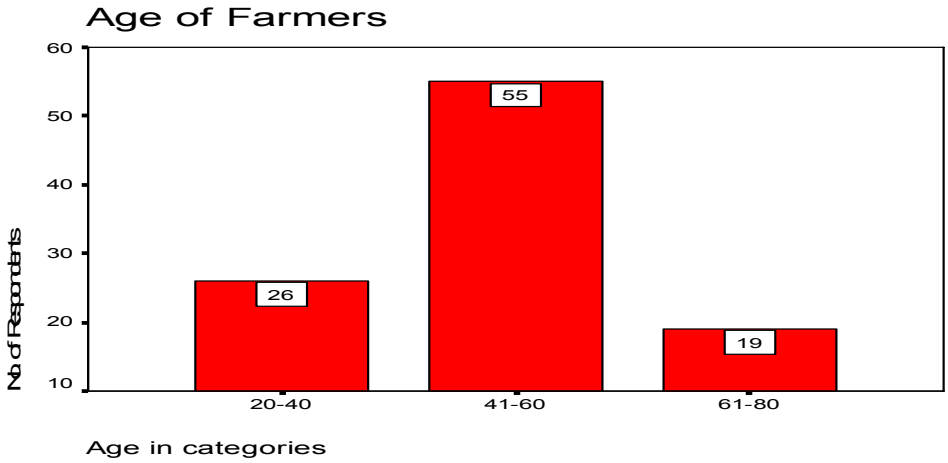



**Figure 1: Frequency Distribution of Respondents by Age**

The chi square test using the age categories (20-40, 41-60 and 61-80) was conducted with the cultural practices such as storytelling, singing of dirges, singing of praise songs, playing of drums and xylophone, use of proverbs, riddles, funeral rites and festivals. All the results obtained indicated no statistical significant difference between age and amount of indigenous knowledge acquired on the cultural practices (Table 1). In other words, the amount of indigenous knowledge acquired is not dependent on age.

**Table 1: Summary of Chi Square Results on Cultural Practices and Age**

| Age/Socio-cultural Practices | | Age Categories | | | | Test/Interpretation |
|---|---|---|---|---|---|---|
| | | 20-40 | 41-60 | 61-80 | Total | |
| Age and storytelling | L | 6 | 16 | 2 | 24 | $X^2 = 2.68$, df = 2, 0.30>p>0.20 |
| | H | 20 | 39 | 17 | 76 | (Not Significant) |
| Age & singing of dirges | L | 13 | 24 | 10 | 47 | $X^2 = 0.59$, df = 2, 0.80>p>0.70 |
| | H | 13 | 31 | 9 | 53 | (Not Significant) |
| Age & singing of praise songs | L | 10 | 12 | 6 | 28 | $X^2 = 2.57$, df = 2, 0.30>p>0.20 |
| | H | 16 | 43 | 13 | 72 | (Not Significant) |
| Age & playing of drums | L | 13 | 37 | 13 | 63 | $X^2 = 2.56$, df = 2, 0.30>p>0.20 |
| | H | 13 | 18 | 6 | 37 | (Not Significant) |
| Age & playing of xylophone | L | 20 | 44 | 14 | 78 | $X^2 = 0.35$, df = 2, 0.90>p>0.80 |
| | H | 6 | 55 | 19 | 22 | (Not Significant) |
| Age & proverbs | L | 5 | 10 | 3 | 18 | $X^2 = 0.07$, df = 2, 0.98>p>0.95 |
| | H | 21 | 45 | 16 | 82 | (Not Significant) |
| Age & riddles | L | 3 | 7 | 2 | 12 | $X^2 = 0.07$, df = 2, 0.98>p>0.95 |
| | H | 23 | 48 | 17 | 88 | (Not Significant) |
| Age & funeral rites | L | 0 | 2 | 2 | 4 | $X^2 = 3.21$, df = 2, 0.30>p>0.20 |
| | H | 26 | 53 | 17 | 96 | (Not Significant) |
| Age & festivals | L | 4 | 15 | 4 | 23 | $X^2 = 1.46$, df = 2, 0.50>p>0.40 |
| | H | 22 | 40 | 15 | 77 | (Not Significant) |

Source: Field survey, 2010

### 5.2. Indigenous knowledge of respondents by distribution by gender

In addition to the productive responsibilities of the farm family, the man and the women also have the responsibility of learning and transmitting the cultural values to the children who are born into the family. The man may be seen training the boys how to rear animals, farm, hunt, select seeds and others whilst the woman is seen guiding the girl on how to cook, wash bowls, sow, how to sit properly in public, dress traditionally and above all respect the elderly.

In the light of this, the sex of respondents was taken to find out whether sex affects the amount of indigenous knowledge acquired by the people in the area. From the data, it was realized that only 17% of the women have their own farms as against 83% of men (Table 2).

**Table 2: Frequency Distribution of Respondents by sex**

| Sex | Frequency (%) |
|---|---|
| Male | 17 |
| Female | 83 |
| Total | 100 |

Source: Field survey, 2010

Besides playing of xylophone and drums which are exclusively men activities, storytelling, singing of dirges and praise songs, use of proverbs, riddles, funeral rites and festivals are all learned and practiced by both sexes. A chi square test between sex and the amount of knowledge acquired on the cultural practices revealed that there was no statistical significant difference between sex and storytelling, singing of praise songs, proverbs, riddles, funeral rites and festivals. In other words, sex is not a limiting factor to the learning of these cultural practices. But between sex and singing of dirges, playing of drums and xylophone, there was a statistical significant difference. This means that the amount of knowledge acquired on these cultural practices depends on whether the learner is a male or female (Table 3)

**Table 3: Summary of Chi Square Test on Sex and Cultural Practices**

| Sex/Socio-cultural Practices | | Sex of Respondents | | | Test/Interpretation |
|---|---|---|---|---|---|
| | | Female | Male | Total | |
| Sex and storytelling | L | 5 | 19 | 24 | $\chi^2 = 0.07$, df = 1, 0.65>p > 0.55 (Not Significant) |
| | H | 12 | 64 | 76 | |
| Sex & singing of dirges | L | 15 | 32 | 47 | $\chi^2 = 12.06$, df = 1, p = 0 (Significant) |
| | H | 2 | 51 | 53 | |
| Sex & singing of praise songs | L | 7 | 21 | 28 | $\chi^2 = 1.06$, df = 1, 0.2<p<0.24 (Not Significant) |
| | H | 10 | 62 | 72 | |
| Sex & playing of drums | L | 17 | 46 | 63 | $\chi^2 = 10.19$, df = 1, p = 0 (Significant) |
| | H | 0 | 37 | 37 | |
| Sex & playing of xylophone | L | 17 | 61 | 78 | X2 = 4.34, df = 1, 0.03>p > 0.02 (Significant) |
| | H | 0 | 22 | 22 | |
| Sex & proverbs | L | 5 | 13 | 18 | $\chi^2 = 1.00$, df = 1, 0.19>p >0.18 (Not Significant) |
| | H | 12 | 70 | 82 | |
| Sex & riddles | L | 2 | 10 | 12 | $\chi^2 = 0.14$, df = 1, 0.99<p <1.00 (Not Significant) |
| | H | 15 | 73 | 88 | |
| Sex & funeral rites | L | 2 | 2 | 4 | $\chi^2 = 1.24$, df = 1, 0.14>p> 0.13 (Not Significant) |
| | H | 15 | 81 | 96 | |
| Sex & festivals | L | 2 | 21 | 23 | $\chi^2 = 0.08$, df =1, 0.40>p> 0.35 (Not Significant) |
| | H | 15 | 62 | 77 | |

Source: Field survey, 2010 Note: $X^2$ = Yates corrected and P = Fisher Exact

The statistical test showed that besides singing of dirges, playing of drums and xylophone which have statistical significant differences with regards to sex, the acquisition of knowledge on cultural practices such as storytelling, singing of praise songs, proverbs, riddles, funeral rites and festivals does not depend on the sex of the individual.

### 5.3. Indigenous knowledge of respondents by distribution by religion

Every individual who is born into the African society is born into a culture that is pervasively religious and requires participation in the religious beliefs and rituals of the community. This is because every human being, irrespective of the culture to which you are born, essentially is a religious being. Religious life, then, is not an individual affair but a communal, woven into the culture of the people, and therefore has a strong influence on the people.

Since religion (traditional, catholic and Islamic religions) has a direct influence on the lives of the people in the area, the religious background of respondents were assessed to determine how much influence religion has

on indigenous knowledge acquisition in the area.

A frequency analysis of the data revealed that 69% of respondents believed and practiced traditional religion and 31% of the respondents were Christians (catholic). No Muslim was captured in the study. This could be due to the fact that almost all the Muslims (few though) within the study area are mostly involved in business activities and not farming.

**Table 4: Frequency Distribution of Respondents by Religion**

| Religion | Frequency | Percent |
|---|---|---|
| Traditional | 69 | 69 |
| Christianity | 31 | 31 |
| Total | 100 | 100 |

Source, Field Survey, 2010

The relationship between religion and amount of indigenous knowledge acquired on playing of xylophone and drums, storytelling, singing of dirges and praise songs, use of proverbs, riddles, funeral rites and festivals was also verified using chi square test and the results showed no statistical significant difference indicating that the amount of knowledge one acquired on these cultural practice did not depend on ones religious background. However, religion and festivals indicated a statistical significant difference (Table 5). All the chi square results are Yates corrected.

**Table 5: Summary of Chi Square Test on Religion and Cultural Practices**

| Religion/Socio-cultural Practices | | Religion of Respondents | | | Test/Interpretation |
|---|---|---|---|---|---|
| | | Traditional | Christianity | Total | |
| Religion and storytelling | L | 17 | 7 | 24 | $\chi^2$ = 0.00, df =1, 0.99>p > 0.98 (Not Significant) |
| | H | 52 | 24 | 76 | |
| Religion & singing of dirges | L | 33 | 14 | 47 | $\chi^2$ = 0.00, df = 1, 0.99>p > 0.98 (Not Significant) |
| | H | 36 | 17 | 53 | |
| Religion & singing of praise songs | L | 21 | 7 | 28 | $\chi^2$ = 0.32, df = 1, 0.58>p>0.57 (Not Significant) |
| | H | 48 | 24 | 72 | |
| Religion & playing of drums | L | 47 | 16 | 63 | $\chi^2$ = 1.84, df = 1, 0.19>p>0.18 (Not Significant) |
| | H | 22 | 15 | 37 | |
| Religion & playing of xylophone | L | 54 | 24 | 78 | $\chi^2$ = 0.06, df = 1, 0.82>p>0.81 (Not Significant) |
| | H | 15 | 7 | 22 | |
| Religion & proverbs | L | 12 | 6 | 18 | $\chi^2$ = 0.00, df = 1, 0.97>p >0.96 (Not Significant) |
| | H | 57 | 25 | 82 | |
| Religion & riddles | L | 9 | 3 | 12 | $\chi^2$ = 0.02, df = 1, 0.76>p>0.75 (Not Significant) |
| | H | 60 | 28 | 88 | |
| Religion & funeral rites | L | 3 | 1 | 4 | $\chi^2$ = 0.08, df = 1, 0.99<p<1.00 (Not Significant) |
| | H | 66 | 30 | 96 | |
| Religion & festivals | L | 2 | 21 | 23 | $\chi^2$ = 47.19, df =1, p = 0 (Significant) |
| | H | 67 | 10 | 77 | |

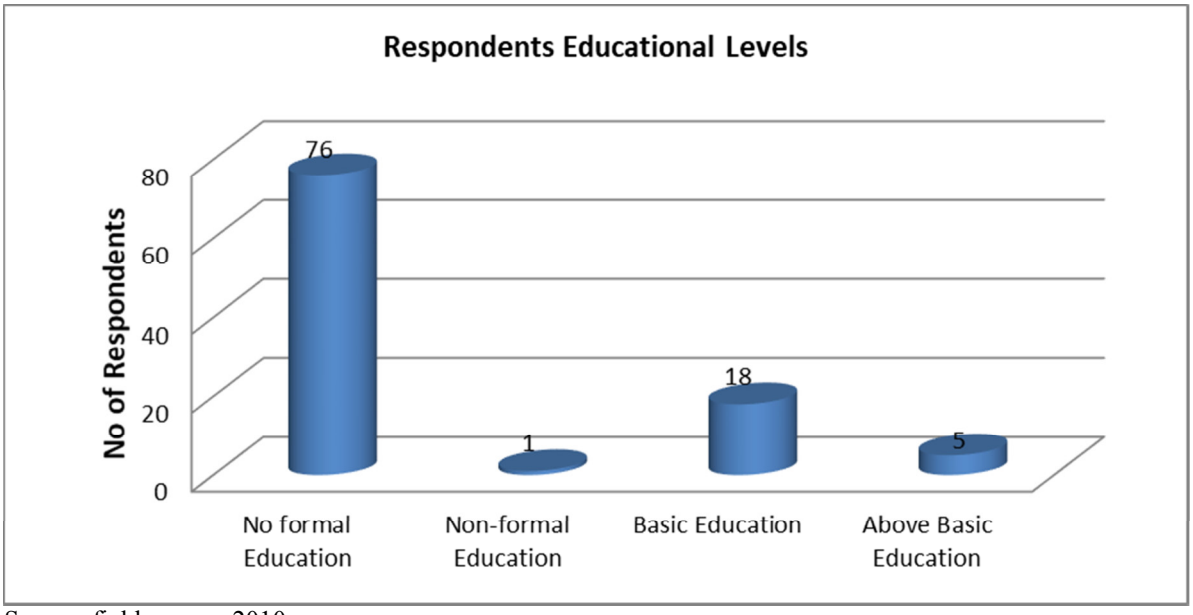
Source: Field survey, 2010

### 5.4. Indigenous knowledge of respondents by distribution by Education

Education whether formal, non-formal or informal is the means through which social values are transmitted to the younger generation with the intension of preserving those values. As a result education which is a very important basic social institution is where both indigenous and scientific knowledge are transmitted through the mechanisms of education though there may be variation in the style of transmission. However, formal education has the capacity of eroding indigenous knowledge by the very fact that it teaches people to be shy of their culture. This is because the distinct culture of indigenous people which is their identity and usually manifested in their economic activities, religious beliefs, notions, and traditional ways of managing natural resources are often regarded as backward and superstitious.

As such, respondents' educational levels were collected to determine whether the amount of indigenous knowledge acquired within the area is based on whether the person has formal education or not. The options for respondents to choose included: No formal education = 1, Non-formal education = 2, Basic education = 3 and above basic education = 4. A frequency test ran on the data indicated that out of the 100 respondents 76% had no formal education , one percent went through non formal education, 18% had basic education and 5% went beyond basic education.




Source: field survey, 2010

**Figure 2: Bar Chart of Respondents Educational Levels**

To ensure easy analysis, the options were categorized into "No formal education" and "Formal education". That is, "No formal education" and "non-formal" became No formal education and "Basic education" and above became "Formal education". The statistical test showed that as far as knowledge acquisition on storytelling, singing of dirges, singing of praise songs, playing of drums and xylophone, use of proverbs, funeral rites and festivals are concerned education is not a determinant factor. That is, no statistical significant difference exists between education and knowledge acquisition on these cultural practices (Table 6).

**Table 6: Summary of chi square test on Cultural Practices and Education**

| Variables/Socio-cultural Practices | | Educational Level of Respondents | | | Test/Interpretation |
|---|---|---|---|---|---|
| | | No Formal Educ. | Formal Educ. | Total | |
| Education and storytelling | L | 19 | 5 | 24 | $X^2 = 0.00$, df = 1, 0.98<p<0.99 (Not significant) |
| | H | 57 | 19 | 76 | |
| Educ. & singing of dirges | L | 35 | 12 | 47 | $X^2 = 0.11$, df = 1, 0.75>p>0.74 (Not significant) |
| | H | 41 | 12 | 53 | |
| Educ. & singing of praise songs | L | 22 | 6 | 28 | $X^2 = 0.00$, df = 1, 0.96<p< 0.97 (Not significant) |
| | H | 54 | 18 | 72 | |
| Educ. & playing of drums | L | 49 | 14 | 63 | $X^2 = 0.00$, df = 1, 0.99<p< 1.00 (Not significant) |
| | H | 27 | 10 | 37 | |
| Educ. & playing of xylophone | L | 59 | 19 | 78 | $X^2 = 0.06$, df = 1, 0.95<p< 0.80 (Not significant) |
| | H | 17 | 5 | 22 | |
| Education & proverbs | L | 14 | 4 | 18 | $X^2 = 0.05$, df = 1, 0.99<p< 1.00 (Not significant) |
| | H | 62 | 20 | 82 | |
| Education & riddles | L | 9 | 3 | 12 | $X^2 = 0.04$, df = 1, 0.99<p< 1.00 (Not significant) |
| | H | 67 | 21 | 88 | |
| Education & funeral rites | L | 3 | 1 | 4 | $X^2 = 0.26$, df = 1, 0.99<p<1.00 (Not significant) |
| | H | 73 | 23 | 96 | |
| Education & festivals | L | 15 | 8 | 23 | $X^2 = 1.56$, df = 1, 0.28>p> 0.21 (Not significant) |
| | H | 61 | 16 | 77 | |

Source: Field survey, 2010
Note: $X^2$ = Yates corrected

**Research Question 2: To what extent does the extension system adapt its teaching methods to the indigenous learning methods of rural farmers?**

One of the objectives of this study was to also investigate the relationship between the extension methods used in the study area and the learning methods of the indigenous farmers who are the beneficiaries of whatever message

that is brought to them.

The effectiveness of the extension teaching methods plays a crucial role in determining how well they adapted into the indigenous learning methods of farmers, Using a five point likert scale (1 = Not effective, 2 = less effective, 3 = moderately effective, 4 = effective and 5 = very effective) the Agricultural Extension Agents (AEAs) were asked to indicate their level of perception about the effectiveness of teaching methods including those that are not used in the area. For a clearer picture of the situation, the perception levels were regrouped into "not effective" (not effective and less effective) and "effective" (that is, moderately effective, effective and very effective).

**Table 7: Frequency Distribution of Perception about Effectiveness of Extension Methods**

| Teaching Methods | Not Effective | | Effective | |
|---|---|---|---|---|
| | Freq | % | Freq | % |
| Office visits | 5 | 83.3 | 1 | 16.7 |
| Farm and home visits | 0 | 0 | 6 | 100 |
| Personal letters | 6 | 100 | 0 | 0 |
| Lecture | 4 | 66.7 | 2 | 33.3 |
| Discussions | 1 | 16.7 | 5 | 83.3 |
| Demonstrations | 0 | 0 | 6 | 100 |
| Field trips | 0 | 0 | 6 | 100 |
| Field days | 0 | 0 | 6 | 100 |
| Agric shows | 1 | 16.7 | 5 | 83.3 |
| Radio | 4 | 66.7 | 2 | 33.3 |

Source, Field Survey, 2010

The results shows that (Table 7) farm and home visits (100%), discussions (83.3%), demonstrations (100%), field trips (100%), field days 100%), and agricultural shows (83.3%) were effective extension teaching methods, however, office visits (83.3), personal letters (100), lecture (66.7), and radio (66.7) were identified to be ineffective teaching methods.

Again, since extension education is to change the behavior of farmers to ensure high productivity, any discussion between the AEAs and farmers must begin with some understanding of the context in which farmers live, operate their farmers and make day-to-day decisions, because farmers are the main actor in agricultural production and they live within a cultural context which determines their beliefs and values and how they learn and transmit these beliefs and values. Hence, it is importance that the extension methods used to change the behavior of farmers be compatible with the learning methods of the farmers.

Rural farmers learn their farming practices and other economic activities that affect their daily lives by adapting various learning methods to acquire the knowledge and later transmitted it to the younger generation. Common indigenous learning methods identified in the study area included listening and practice, imitation, observation, oral instructions, questions and answers and trial and error. Indigenous learning activities are mostly experiential. Learners usually listen, observe, take oral instructions and then go ahead to practice or imitate whatever that is observed or heard. Sometimes the elders demonstrate the task to the learner to imitate.

As such, it was realized that individual and mass methods were not used in the area and for that matter, farm and home visit, which is an individual method, in principle, and an effective teaching method is not practiced in the area. On the other hand, the reason offered for the ineffectiveness of the other extension methods was high illiteracy rate in the area. However, among the three broad extension methods: individual, group and mass methods only two of the group methods are used in the area. That is, method demonstration and group discussions. This means that farmers are not benefiting from individual methods such as farm and home visits, office calls, telephone call and others. Though time consuming and costly, the individual methods of teaching offers the extension workers an opportunity to learn more about the people of the area, how they think, their practices, what their needs are and how they carry out their work. The farmer on the other hand, also gets to know the extension agents when they work on one-to-one basis leading to the establishment of a bond between them (Kang & Song, 1984). This will also eliminate the conspiracy of courtesy theory; rural people treating outsiders nicely without revealing themselves or the truth. (Van der Stichele, 1998)

Also, the individual methods are effective when dealing with illiterate farmers working on small holdings who are not normally exposed to other educational techniques (Kang & Song, 1984). This applies to the farmers in the study area as majority of them are illiterates and are only used to their indigenous methods of learning and not any other methods. In addition, the individual contact methods usually are effective and enhances interaction and action because of face-to-face relationship of the extension staff and the farmer.

Contrary, however, the AEAs only rely on the group methods of teaching farmers in the area which they said enable them to reach many farmers at a time but they were unaware of the fact that each individual attending a demonstration (a group method) should be given the opportunity to practice the new skill during the

demonstration session. But normally, due to time constraint, no farmer may be allowed to carry out a demonstration. In the light of this, the principles of adult learning which shows that experiential learning is crucial to adult learners, because it enhances further learning, and they also learn best when there is interconnection and meaning. In this case farmers do not get the interconnection between the messages they get from the group discussion or the explanation by the AEAs and real life experience as they do not get the chance to participate in the demonstration.

On the other hand, apart from the discussions and demonstrations, other group methods such as field trips, field days and agricultural shows are rarely or never used in the area. This clearly indicates that the extension teaching methods were not at the same wave length with the indigenous learning methods because the extension methods that are used in the area do not create much room for experiential learning for the farmers which is the way they learn in the area and did not also permit the farmers achieve higher production targets.

This was evidenced in the fact that most farmers were not practicing the new innovations taught them because the rural farmer will not change easily attitudes developed and knowledge acquired over time to adopt new innovations introduced especially when it is not compatible with his indigenous values and practices. For instance, the farmers were taught to always level their farms before planting and not on the mounds which has been the practice in the area. But the farmer ignored hat innovation because it was not suitable for low lands as it easily becomes flooded and weed control was also difficult on the flat lands and it was also labour intensive to level their farms because they have no access to bullocks and/or tractors and even if they got the tractor or bullocks the cost involved was above their means.

On the improved seeds introduced to the farmers, they were not using them because they said the seeds could not be preserved in the traditional way unless with chemicals, could not be cultivated without fertilizer and on the mounts, and were always supplied in small quantities. Farmers equally had a lot reasons for not using the storage method taught them as they indicated that they prefer the indigenous methods of preserving their crops because the chemical method prevented them from using the produce at the time they wanted it and fear of its' bad side effects and also they chemicals were not always available at the time they needed it coupled with the high cost.

Innovations regarding livestock management were equally not practiced because of the non-availability of veterinary officers and the high cost of vaccinating and treating the farm animals. For that matter they relied on their indigenous methods of using dawadawa seeds to treat protracted labour of animals, *lodal* (a herb) for treating sores, ticks and lice of farm animals, honey for animals without appetite, and others. These challenges existed because the AEAs were not using the individual methods which could have allowed them to interact with the farmers one-on-one and be able to identify the specific problems the individual farmers were facing thereby eliminating the conspiracy of courtesy theory.

## 6. Conclusion

The objectives of the study were to find out how socio-cultural factors affect the acquisition of indigenous knowledge and to assess how adaptable the extension methods are to the indigenous learning methods of the Dagara community. Some of the socio-cultural factors investigated in this study included age, sex, education and religion. Apart from gender, it was realized that the socio-economic factors have no significant influence on the acquisition of knowledge on cultural practices such as storytelling, singing of dirges, playing of drums and xylophone, use of proverbs, riddles, funeral rites and festivals. Gender was found to have significant influence on the amount of knowledge acquired on dirges, playing of drums and xylophone. The common indigenous learning methods identified in the study area included listening and practice, imitation, observation, oral instructions, questions and answers and trial and error. Also, the extension methods used in the area to pass on innovations to farmers did not permit them to learn experientially because they were not given the opportunity to practice what they were told resulting in little or no learning. The accumulated knowledge of these farmers was always factored into the whole innovation transmission, thereby further emphasizing on the inferior role of indigenous knowledge. This implies that not much result could be achieved in the area with regards to increased food production thereby making farmers in the area poorer and poorer in an area that has its population constantly increasing. Again, farmers learning through imitation and practicing what they observed were not promoted due to the way and manner extension services were provided in the area thereby accounting for a weak relationship between extension teaching methods and indigenous learning methods.

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