

Farmers Perceptions and Attitudes Towards the Use of Agricultural Indigenous Knowledge in Farming

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Abstract

Attitudes can be strong predictors of behaviours or the acceptance of ideas. The study therefore investigated the attitude of small scale farmers towards the use of Agricultural Indigenous knowledge in their farming activities. Using multistage sampling techniques involving simple random and snow sampling techniques 185 respondents were selected from eight communities in the district. Data was collected using questionnaire and analyzed using both descriptive and inferential statistical analysis. The results show that farmers have positive attitude towards the use of Agricultural Indigenous Knowledge (AIK) in their farming. The study also indicated that gender and age have significant effect on the attitude of farmers towards the use AIK however education has no significant effect.

Keywords: Philosophical; Strategies; Aspirations; Marginal; Internalized; Crucial; Innovation.



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1. Introduction

According to [Alavi and Leidner \[1\]](#) the question of defining knowledge has occupied the minds of philosophers since the classical Greek era and has led to many epistemological debates. Knowledge is processed in the mind of an individual it is internalized information related to facts, concepts, ideas and observations. A study conducted by [Azman, et al. \[2\]](#) define knowledge as an organized or processed information or data that is crucial in any innovation process. Earlier other researchers defined knowledge as a creation by a combination of education and experience [\[3-5\]](#). [Calvo-Iglesias, et al. \[6\]](#) explained that knowledge is used by farmers to arrive at decisions that influence agricultural management practices.

1.1. Agricultural Indigenous Knowledge

The terms that are used to describe indigenous knowledge(IK) are ‘local knowledge’, ‘indigenous traditional knowledge’, ‘indigenous technical knowledge’, ‘traditional environmental knowledge’, ‘rural knowledge’ and ‘traditional ecological knowledge’. In a study by [Steiner \[7\]](#), indigenous/traditional knowledge is described as the knowledge of an indigenous community accumulated over generations living in a particular environment. It is traditional cultural knowledge that includes intellectual, technological, ecological and medical knowledge. According to [Johnson \[8\]](#) Indigenous knowledge can also be defined as a body of knowledge built up by a group of people through generations of living in close contact with nature. Some authors have attempted to differentiate these terms, especially ‘local’ and ‘indigenous’. In [Langhill \[9\]](#), for example, ‘indigenous knowledge’ is said to refer to the knowledge possessed by the original inhabitants of an area, while the term ‘local knowledge’ refers to the knowledge of any people, not necessarily indigenous, who have lived in an area for a long period of time. According to [Mugabe \[10\]](#), the local weather and climate is assessed, predicted and interpreted by locally observed variables and experiences using combinations of plants, animals, insects and meteorological and astronomical indications.

Indigenous knowledge systems (IKS), is an integrated pattern of human knowledge, beliefs, and behavior. Language, ideas, beliefs, customs, taboos, rituals, ceremonies, folk stories, artifacts and techniques all combine as constituents of IKS. IKS is thus a “combination of knowledge systems encompassing technology, social, economic and philosophical learning, or educational, legal and governance systems” [\[11\]](#).

According to [Hashim \[12\]](#) the people of Butana in the Kassala state of Sudan have developed through their IK some types of land and soil classification. Accordingly, to the study they practice some patterns of land use that suit each type of soil. They grow different local varieties of sorghum such as geshesh and korokolu in the Mahwa land while mugad variety is usually grown in Elwadi land. Also some vegetables like cucumber and Okra are grown by women under this type of land use. Because the direct rainfall is insufficient to secure a successful season in Mahwa land people use their IK in throwing small earth bunds that follow the contour lines in order to slow the sheet flow of water so as to enhance the soil moisture holding capacity.

In a study by [Hashim \[12\]](#) Pastoralists uses the mechanism of moving from one place to another in order to cope with their surrounding environment that changes from season to season. By doing this they meet their animals requirements for pasture and water. Their IK has shown them that diversification of their herds is conducive for facing the catastrophic climatic conditions. In the project area it is quite normal to see camels, goats, and sheep as part of one herd. Agro pastoralists tend to keep cattle instead of camels and other concentrate on cattle only because the climatic conditions which they operate under do not suit raising small animals like sheep and goats. According to

Hashim [12] some pastoralists leaders from Eastern Sudan have described their position as good relation with farmers in irrigated schemes like Halfa Elgadida and Elrahad who give their animals good relief in bad seasons

An understanding of farmers' knowledge is useful for understanding of their attitude. In the view of the authors [13-15] attitudes can be strong predictors of behaviours or the acceptance of ideas. According to Gorton, *et al.* [16] policy-makers have recognized that the way in which farmers adjust to changes in agricultural policy depends partially on the latter group's attitudes and mind-sets. When providing new technology to farmers, understanding their perceptions and attitudes can shed light on why farmers adopt technologies beyond their economic benefits and which industry researchers should focus on to encourage the adoption of these technologies [17]. Many historians have argued that the evaluation of farmers' knowledge and perceptions is essential for the development of management strategies that match farmers' aspirations and are thus likely to be adopted [18-21]. Yang, *et al.* [22] added that the evaluation of farmers' knowledge, perception and practices regarding a new technology is essential for the development of strategies to sustain the new technology.

1.2. Attitude of Farmers towards Indigenous Knowledge in Farming

According to authors Ajzen [13]; Dietz, *et al.* [14]; Arbuckle Jr, *et al.* [15] attitudes can be strong predictors of behaviours or the acceptance of ideas. In the a study by Gorton, *et al.* [16] it was revealed that policy-makers recognised the way farmers adjust to changes in agricultural policy depends partially on the latter group's attitudes and perception. Also Adrian, *et al.* [17] are of the view that when providing new technology to farmers, understanding their perceptions and attitudes can shed light on why farmers adopt technologies beyond their economic benefits and which industry researchers should focus on to encourage the adoption of these technologies. Many researchers such as Chitere and Omolo [18]; Rubia, *et al.* [19]; Tanzubil and Yakubu [20]; Nyeko, *et al.* [21] have argued that the evaluation of farmers' knowledge and perceptions is essential for the development of management strategies that match farmers' aspirations and are thus likely to be adopted and used. Several studies have attempted to explain the attitude of farmers towards issues relating to farming. In the study by Farouque and Takeya [23] they assessed farmers' attitudes towards different samples based on landholder (landless or holding marginal, small, medium-sized or large farms). Also Alam, *et al.* [24] assessed farmers' attitudes towards four different farm sizes according to landholder class. (marginal, small, medium-sized and large farms). In addition Cavane [25] assessed farmers' attitudes towards farming in the highlands and lowlands of the Manica district, Mozambique. However, little research has explored farmers' perceptions and attitudes towards the use of agricultural indigenous knowledge in farming hence the study. The main objective of the study would therefore be to examine the attitude of small scale farmers towards the use of Agricultural Indigenous Knowledge. In order to achieve the main objective, the study would specifically explore the effect of age, gender and the educational status on the attitude of farmers on AIK usage.

2. Methodology

The study was carried out in Ada east district of Greater Accra region, Ghana. The district shares common boundaries with the Central Tongu District to the North, South Tongu District and Ada West to the East and West respectively. It is bounded to the south by the Gulf of Guinea, which stretches over 18 kilometers from Kewunor to Totope. It is also bounded by the Volta River South-Eastwards extending to the Gulf of Guinea southwards thereby forming an Estuary, about 2 kilometers away from the District capital, Ada-Foah. Simple random sampling and snow ball sampling techniques were used in selecting 185 respondents from eight communities in the district. Both primary and secondary data was used. The primary data was collected using both structured questionnaire and interview. Secondary data was collected from journals, publication and newsletters. Both descriptive and analytical statistical tools were used in analyzing the data. Descriptive statistical tools such as frequency tables, percentages were used. The analytical statistical tools used include MANOVA and multivariate test analysis.

3. Results and Discussions

3.1. Demographic Characteristics of Respondents

Table 1 shows the results of the demographic characteristics of respondents.

Table-1. Demographic characteristics

Demographic Characteristics	Frequency	Percent	
Gender	Male	89	48
	Female	96	52
Age	20-30 Years	16	9
	31-40 Years	41	22
	41-50 Years	52	28
	51-60 Years	29	16
	above 60 years	47	25
Marital status	Single	10	5
	Married	140	76
	Widowed	22	12
	Divorce	13	7

Educational Level	No Formal Education	13	7
	Basic Education	139	75
	Secondary Education	20	11
	Tertiary	13	7

Source: Field study 2017

The results from the table indicates that majority (52%) of the respondents were female while males were in the minority (48%). The distribution of gender confirms the 2014 Ghana Statistical Service population report which indicated that there more females in the district than males.

On age cumulatively majority (74%) of the respondents below 60 years and 25% are above 60 years. The results indicated that majority of the respondents are in the active age group who should have more strength and good attitude towards indigenous knowledge in their farming activities which result in increased productivity. The results are also similar to an earlier study by [Mugisha-Kamatanesi, et al. \[26\]](#) which reported that 53% of active farmers in Uganda were mostly between the ages of 31 and 50 years.

On marital status an overwhelming majority (76%) of the respondents are married with only 5% being single. This results gives an indication that majority of the small scale farmers in the district are married couple who can complement each other thereby reducing stress and labour cost normally associated with farming. Also this would enable them to have a good attitude towards the usage of indigenous knowledge because member become a potential source of the knowledge. One other item measured as a demographic characteristic was the educational level of the respondents. It was revealed from the study that 75% had a basic education. Basic education includes junior high school and middle school. Also 11% had secondary education, 7% tertiary education and 7% had no formal education. The results show that majority of the respondents can read and write. In other words, majority of the respondents are enlightened. Education is a tool that can shape the life of an individual and that can change the attitude of an individual. With majority of respondents being literate it will have a ripple effect on their attitude towards the usage of indigenous knowledge.

3.2. Descriptive Analysis of Farmers Attitudinal Statements

Respondents were asked to measure the given statements regarding their attitude towards the use of indigenous knowledge in their farming activities. Likert scale 1= Disagree, 3= Don't know and 4= Agree was used in the measurement of the attitudinal statements. The result is indicated in [table 2](#) as shown below.

Table-2. Distribution of respondents according to their attitude toward indigenous knowledge

Farmers Attitudinal Statements	Disagree (%)	Neutral (%)	Agree (%)
Planting of legumes improve soil fertility	2	2	96
Plant Legumes to prevent soil erosion	1	4	95
Practiced crop rotation improves soil texture	1	17	82
Practiced mulching to reduced evaporation from the soil	1	10	89
Practiced bush fallowing to improved soil fertility	7	6	87
Bush fallowing causes soil erosion	64	7	29
Drainage prevent water logging in the soil	8	13	79
Manuring improve water conservation	7	22	71
Organic farming improve soil structure	8	27	65
The burning of green manure is of no use	20	38	42
Repeated planting of same crop results in delayed maturity	3	9	88
Sufficient gaps between crops maintain the soil fertile	2	45	53
Drying crop seeds for one month before storing	8	16	76
Application of farm yard manure reduces incidence of pests	18	30	52
Dipping tubers in clayey protect tubers from rotting	10	34	56
Closer planting of crops control weeds	16	25	60
Intercropping cotton and groundnut is practiced	10	50	40
Clayey soil is suitable for rice cultivation	10	51	39
Pure cow dung is not effective for the crops	18	48	34
Sheep manure is more effective than cattle manure	13	25	62
Threshing of seeds manually help maintain seed quality	1	20	79
Crop rotation minimizes pest incidence	2	35	63
Practiced bush fallowing to improved soil fertility	2	34	64

From the statistical data presented in [table 2](#), it was revealed that more than 50% of respondents agree with each of the attitudinal statements except "Bush fallowing causes soil erosion" which 64% disagree with. Also respondents were neutral with three of the statements. That is, they neither agree nor disagree with these statements. The results of the study show that small scale farmers in the study area have positive attitude towards the use of indigenous knowledge in their farming activities.

Attitude, as defined by [Horne \[27\]](#) represents the mental and neural state of readiness, organized through experience. It influences an individual's response to all objects and situations. According to [Ajzen \[13\]; Dietz, et al.](#)

[14]; Arbuckle Jr, *et al.* [15] attitudes can be strong predictors of behaviours or the acceptance of ideas. Since small scale farmers have positive attitude towards the use indigenous knowledge this would help them to share their knowledge with each other to enhance cross-cultural understanding and promote the cultural dimension of farming in the study area.

4. Multivariate Analysis

The data was again subjected to multivariate analysis to show the significance of gender, age and education level and their interactions on farmer's attitude towards the use of indigenous knowledge in their farming activities. The result is shown in table 3.

Table-3. Multivariate Tests

Demographic characteristics	Pillai's Trace value	F	Hypothesis df	Error df	Sig.
Gender	.272	2.049	23	126	.006
Age	1.517	3.427	92	516	.000
Educational level	.480	1.059	69	384	.361
Gender * Age	.704	1.198	92	516	.118
Gender * Educational level	.517	1.158	69	384	.198
Age * Educational level	1.711	.990	276	1644	.533
Gender * Age * Educational level	1.346	1.025	20	1206	.399

The results in the table shows that there is significant effect of gender on the attitude of small scale farmers towards the use of indigenous knowledge at Pillai's Trace value (.272), $F = 2.049$, d.f (23,126) and significant level of .006 ($p < .05$). Also age has a significant effect on the attitude of small scale farmers towards the use of indigenous knowledge at Pillai's Trace value (1.517), $F = 3.427$, d.f (92,516) and significant level of .000 ($p < .05$). On the other hand, educational level has no significant effect on the attitude of small scale farmers towards indigenous knowledge at Pillai's Trace value (.480), $F = 1.059$, d.f (69,384) and significant level of .361 ($p > .05$).

The interaction between gender and age has no significant effect on the attitude of small scale farmers towards indigenous knowledge at Pillai's Trace value (.704), $F = 1.198$, d. f (92,516) and significant level of .118 ($p > .05$). Also the following interactions have no significant effect on the attitude of small scale farmers towards indigenous knowledge: Gender and educational level at Pillai's Trace value (.517), $F = 1.158$, d.f (69,384) and significant level of .198 ($p > .05$); Age and educational level at Pillai's Trace value (1.711), $F = .990$, d.f (276,1644) and significant level of .533 ($p > .05$) and Gender, Age and Educational level at Pillai's Trace value (1.346), $F = 1.025$, d.f (20,1206) and significant level of .399 ($p > .05$).

5. Conclusion

As in many parts of Africa, Ghanaian farmers are noted for their use of indigenous knowledge in their farming activities. The study reveals that small scale farmers in the study area have positive attitude towards the use of indigenous knowledge in their farming activities. According to the authors Ajzen [13] Dietz, *et al.* [14]; Arbuckle Jr, *et al.* [15] attitudes can be said to be a strong predictors of behaviours or the acceptance of ideas. The study also revealed that gender and age have an effect on the attitude of small scale farmers towards the use of indigenous knowledge. We can therefore conclude from the findings of the study that small scale farmers in the study area have accepted the use of indigenous knowledge in their farming.

References

- [1] Alavi, M. and Leidner, D. E., 2001. "Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues." *MIS Quarterly*, vol. 25, pp. 107-136.
- [2] Azman, A., D'Silva, J. L., Samah, B. A., Man, N., and Shaffril, H. A. M., 2013. "Relationship between attitude, knowledge and support towards the acceptance of sustainable agriculture among contract farmers in Malaysia." *Asian Soc. Sci.*, vol. 9, pp. 99-105.
- [3] Mangan, J. and Mangan, M. S., 1998. "A comparison of two IPM training strategies in China: The importance of concepts of the rice ecosystem for sustainable insect pest management." *Agric. Human Values*, vol. 15, pp. 209-221.
- [4] Brosius, P. J., Lovelace, G. W., and Marten, G. G., 1986. *Ethnopedology: An approach to understanding traditional agricultural knowledge*. In: *Traditional agriculture in Southeast Asia: A human ecology perspective*, Marten, G.G. (Ed.). Boulder, CO, USA: Westview Press. pp. 187-198.
- [5] Grossman, J. M., 2003. "Exploring farmer knowledge of soil processes in organic coffee systems of Chiapas, Mexico." *Geoderma*, vol. 111, pp. 267-287.
- [6] Calvo-Iglesias, M. S., Crecente-Maseda, R., and Fra-Paleo, U., 2006. "Exploring farmer's knowledge as a source of information on past and present cultural landscapes: A case study from NW Spain." *Landscape Urban Plann*, vol. 78, pp. 334-343.
- [7] Steiner, A., 2008. "Indigenous knowledge in disaster management in Africa. United Nations Environment Programme (UNEP)." Available: <http://www.unep.org/IK/PDF/IndigenousBooklet.pdf>
- [8] Johnson, M., 1992. *Lore: capturing traditional environmental knowledge*. Ottawa: Dene Cultural Institute and the International Development Research Centre.

- [9] Langhill, S., 1999. *Indigenous knowledge: a resource kit for sustainable development researchers in dry land Africa*. Ottawa: IDRC.
- [10] Mugabe, F. T., 2010. "Use of indigenous knowledge systems and scientific methods for climate forecasting in southern Zambia."
- [11] Odora, H. C. A., 2002. "Research on Indigenous Knowledge Systems: The Search for Cognitive Justice as a Fraternal Act. Unisa Annual Faculty Of Education Seminar: Research in the Faculty of Education. Senate Hall."
- [12] Hashim, M. O., 2013. "PR-325-Sudan- Working Paper on: Role of Natural Forage Plants Diversity in Pastoral and Agro-pastoral communities Livelihood."
- [13] Ajzen, I., 1991. "The theory of planned behavior." *Organiz. Behav. Hum. Decis. Process*, vol. 50, pp. 179-211.
- [14] Dietz, T., Fitzgerald, A., and Shwom, R., 2005. "Environmental values." *Annu. Rev. Environ. Resour.*, vol. 30, pp. 335-372.
- [15] Arbuckle Jr, J. G., Morton, W. L., and Hobbs, J., 2013. "Farmer beliefs and concerns about climate change and attitudes toward adaptation and mitigation: Evidence from Iowa." *Climatic Change*, vol. 118, pp. 551-563.
- [16] Gorton, G., Ping, H., and Lixin, H., 2008. "Monitory and manipulating:Asset price when agent are market-to-market, working paper "
- [17] Adrian, A. M., Norwood, S. H., and Mask, P. L., 2005. "Producers' perceptions and attitudes toward precision agriculture technologies." *Comput. Electron. Agric.*, vol. 48, pp. 256-271.
- [18] Chitere, P. O. and Omolo, B. A., 1993. "Farmers' indigenous knowledge of crop pests and their damage in western Kenya." *Int. J. Pest Manage*, vol. 39, pp. 126-132.
- [19] Rubia, E. G., Lazaro, A. A., Heong, K. L., Nurhasyim, D., and Norton, G. A., 1996. "Farmers' perceptions of the white stem borer *Scirpophaga innotata* (Walker), in Cilamaya, West Java, Indonesia." *Crop Prot.*, vol. 15, pp. 327-333.
- [20] Tanzubil, P. B. and Yakubu, E. A., 1997. "Insect pests of millet in northern Ghana. 1. Farmers' perceptions and damage potential." *Int. J. Pest Manage*, vol. 43, pp. 133-136.
- [21] Nyeko, P., Edwards-Jones, G., Day, R. K., and Raussen, T., 2002. "Farmers' knowledge and perceptions of pests in agroforestry with particular reference to *Alnus* species in Kabale district, Uganda." *Crop. Prot.*, vol. 21, pp. 929-941.
- [22] Yang, P., Iles, M., Yan, S., and Jolliffe, F., 2005. "Farmers' knowledge, perceptions and practices in transgenic BT cotton in small producer systems in Northern China." *Crop. Prot.*, vol. 24, pp. 229-239.
- [23] Farouque, M. G. and Takeya, H., 2007. "Farmers perception of integrated soil fertility and nutrient management for sustainable crop production: A study of rural areas in Bangladesh." *J. Agric. Educ.*, vol. 48, pp. 111-122.
- [24] Alam, M., Furukawa, Y., and Mika, M., 2010. "Perceptions, preferences and attitude of Bangladesh farmers towards home garden farming systems." vol. 9, pp. 213-226.
- [25] Cavane, E., 2011. "Farmers' attitude and adoption of improved maize varieties and chemical fertilizers in Mozambique." *Indian Res. J. Ext. Educ.*, vol. 11, pp. 1-6.
- [26] Mugisha-Kamatenesi, M., Deng, A., Ogendero, J., Omolo, E., Mihale, M., Otim, M., Buyungo, J., and Bett, P., 2008. "Indigenous knowledge of field insect pests and their management around lake Victoria basin in Uganda." *Afr. J. Environ. Sci. Technol.*, vol. 2, pp. 342-348.
- [27] Horne, M., 1985. *Attitudes toward handicapped students: professional, peer, and parent reactions*. Hillsdale, NJ: London: Lawrence Erlbaum Associates.