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Full Length Research Article

ASSESSMENT OF GINGER PRODUCTION VALUE CHAIN INFORMATION NEEDS FOR SUSTAINABLE LIVELIHOOD IN KACHIA LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA

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ABSTRACT
Ginger production is dominated by small holder low-income farmers, though experienced, yield remained consistently and relatively low. Hence the study investigated information needs of farmers using closed structured questionnaires, randomly but purposefully distributed to 120 farmers in Agunu, Gidan Tagwai, Gumel, Kurmin Musa, Kwaturu and Sabon Sarki wards in Kachia. Data were subjected to descriptive statistics, mathematical techniques(Confrontation indexes), correlation and regression analyses at $p \leq 0.05$. Results showed that 80.83 % married male (66.67 %) within the ages of 31-40 years (46.67 %) dominated production with average farm size of 1-2 ha and farming experience of 6-7 years. Of the 14 identified information needs, six were needed with pest management (3.85), fertilizer (3.84), marketing information (3.59) and source of credit ranking high while seven were rarely needed but irrigation and water management were not needed. Evidently, ginger farming is basically on traditional technology as major source of information is from parents and friends (39.86 %) coupled with problems like irregular power (3.63), inadequate funds for digital information (3.44) and inadequate information dissemination (3.43). Positive and significant correlation and regression coefficient between demographic data and information needs (sex ($R^2 = 0.847$), farm size ($R^2 = 0.728$) and family size ($R^2 = 0.707$)) indicated strong influence. Therefore, *inter alia* emphasis on the use of digital knowledge, women involvement, funding, functional extension services, training and retraining of farmers are imperative to improve production and livelihood of farmers.

Keywords: Ginger, value chain, dissemination, sustainability, livelihood, production

INTRODUCTION

Ginger (*Zingiber officinale* Roscoe.) is an important cash crop in Nigeria (Asumugha, Kormawa and Haan, 2009), known for its spicy, aromatic and medicinal properties (Mashhadi, Ghiasvand, Askari, Hariri, Darvishi and Mofid, 2013; Mozaffari-Khosravi, Talaei, Jalali and Najarzadeh, 2016). The tropical climate and fertile soil provides favourable conditions for cultivation (www.fao.org: www.gingerassociation.org), and the crop plays significant role in providing income, foreign exchange and employment opportunities for numerous farmers as well as contribute immensely to growth of agricultural sector (Sodangi, 2020a). Nigeria is one of the leading producers and exporter of ginger with 14 % share in total global production (FAO, 2016), however with low yield of 3-4 t/ha (FAO, 2011; Ayodele and Sambo, 2014) and yield potential of 21.7-27 t/ha (Sodangi, 2020b; Thrive Agcric. 2020). A total of 90 % Nigeria ginger is exported in split-dried form (Guchemann, 2010).

The low but high yield potential of ginger in Nigeria has been associated with bulkiness of rhizomes (buds) and consistent use of local yellow and reddish ginger varieties cultivated over years (Onwusiribe, Mbanasor and Agwu, 2016). Such 'seeds' are selected from previously harvested ginger, or obtained from relations, neighbour or purchased from farmers (Ibrahim, 2018). Others factors include very poor cost and labour-intensive agronomic practices in tillage (Sati and Bala, 2017), planting, mulching, weeding, fertilizer application, agrochemical, processing and harvesting which are manually done (Hassan, Onwunali and Ibrahim, 2020) and lack of value addition through mechanical processing (Ibrahim, 2018). A more currently devastating impediment is the inconsistent weather due to climate change which makes farmers resort to reduced cultivable land when the season is almost over.

In order to maximize ginger potentials, it is essential to address the information needs of farmers and stakeholders involved in the production chain. Access to accurate and up to date information is crucial for enhancing productivity, improving cultivation practices, and ensuring sustainable and profitable production (Ejechi, Madu, Lenka, Mbadiwe, 2018; Hassan, Onwunali and Ibrahim, 2020). Understanding of these needs will place policymakers, researchers and agricultural extension services in a better position to develop support mechanisms that will address the challenges of farmers and promote growth of ginger industry.

Information needs of farmers encompasses *inter alia*, cultivation techniques in land preparation, seed selection, planting methods, and soil nutrient management. Access to knowledge of appropriate irrigation system, pest and disease management and harvesting practices will improve quality and yield of ginger (Omodara, Onwunali and Hiikyaa, 2021). Producers require accurate and timely information on market demand, prices, trends both domestically and internationally, knowledge of market channels, trade regulations and export opportunities. These will facilitate farmers decisions regarding production volume, timing and pricing strategies. Furthermore, knowledge of post-harvest handling, processing techniques, storage and value addition impact on profitability is a *sine quo non* to the understanding of drying, grading and packaging to enhance shelf life, quality and market value.

Furthermore, access to input and resources, respect to availability, quality and pricing of inputs like seeds, fertilizers, pesticides and machinery empower farmers. But knowledge of government schemes, financial assistance and agribusiness development opportunities facilitates access to resources of production. Given the impact of climate change on agricultural production, farmers

need ICT techniques on climate smart practices in adaption strategies and conservation measure (Mbanasor, Nwachukwu and Agwu, 2015; Onwunali, Hassan and Usman, 2020). The techniques encourage awareness to sustainable measures, organic farming and certification requirement to support adoption of environmentally friendly practices.

Ginger farming is significant to livelihood of farmers and has dominated the production of other arable and tree crops in Southern Kaduna, particularly in Kachia (Ibrahim, 2018). Despite the efforts of farmers on increased cultivable land and fertilizer application, yield remains below potential capacity (FAO, 2011; Sodangi, 2020a) due to use of traditional technology, poor inputs, inadequate production, poor financial capacity, poor processing and handling, poor knowledge of marketing and storage, pests and diseases among others (Amadi, Nwauzor, Nuhu, and Christy, 2010; Onwusiribe, Mbanasor and Agwu, 2016), hence creating a serious gab in information acquisition of farmers. Consequently, the rich middlemen grabs the market at the expense of the low-income farmers and the public.

The study will establish farmers' information needs in Kachia Local Government Area to facilitate training for sustainable livelihood through ginger production.

Specifically, the study sought to:

i. Determine the socioeconomic characteristics of the farmers.
ii. Identify sources of production information acquisition.
iii. Determine the information needs of farmers.
iv. Identify the problems of information acquisition on ginger production.

The following research questions facilitated the study:

i. How does a socioeconomic characteristic of the farmers influence ginger production?
ii. What are the sources of information acquisition of ginger farmers and the influence on production?
iii. What are the information needs of the farmers?
iv. What are the constraints of ginger production?

MATERIALS AND METHODS

Kachia is located at latitude 9^0 52'24" North and longitude 7^0 57' 14" East at elevation of 718 meters above sea level (masl) (http: //www.distancesto.com/coordinats/ng/Kachia-latitude/history/41511html), with total population of 340, 900 based on report of National Bureau of Statistics 21st March, 2016 (https://en.wikipedia.org).

Administratively, Kachia Local Government is divided into twelve wards namely; Agunu, Ankwa, Awon, Bishini, Dakwa, Gidan Tagwai, Gumel, Kachia, Kateri, Kurmin Musa, Kwaturu and Sabon Sarki. The areas experience seasonal variations in monthly rainfall from March to November, with the peak in August receiving an average of 281.94 mm (http://weatherspark.com). Kachia has long standing history of ginger production with favourable agro-ecology (Sodangi 2020a), but still experience inefficient and low productivity due to inadequate improved cultivars, poor soil fertility and poor agronomic technology.

The study was carried out in six prominent ginger producing wards; Agunu, Gidan Tagwai, Gumel, Kurmin Musa, Kwaturu and Sabon Sarki, using a total of 120 validated closed structured questionnaires, randomly and purposefully distributed to 20 farmers per ward. The instrument comprised of four sections; demographic information of the farmers, sources of information acquisition, information needs and problems of information acquisition on ginger production . The questionnaire were administered in the farm during the 2022 cropping season with coordinated Local Research Assistants. Validation of instruments was done by experts in the Department of Agricultural Education, Federal College of Education, Zaria while test and reliability was determined using Pearson Product Moment Correlation Statistics that gave 0.88 coefficient.

A 4 point rating scale was used to evaluate 14 information needs as Highly needed (HN), Needed (N), Rarely needed (RN), and Not needed (NN) and 9 problems as Strongly agreed (SA), Agreed (A), Disagreed (D) and Strongly disagreed (SD). Weighted values of 4, 3, 2 and 1 were assigned to the scale, respectively while multiple choice were allowed in the source of information.

Data on demographic and sources of information were subjected to descriptive statistics while farmers' information needs and problems were analyzed with mathematical techniques using confrontation indexes (Hassan, Onwunali and Ibrahim, (2020) with modification as follows:

$NCI = [N_{HN}x4] + [N_Nx3] + [N_{RN}x2] + [N_{NN}x1]$

Where: NCI = Needs Confrontation Index
HN = Number of farmers that ticked highly needed in each item
N = Number of farmers that ticked needed in each item
RN = Number of farmers that ticked rarely needed in each item
NN = Number of farmers that ticked not needed in each item

$PCI = [P_{SA}x4] + [P_Ax3] + [P_Dx2] + [P_{SD}x1]$

Where: PCI = Problem Confrontation Index
SA = Number of farmers that ticked strongly agreed in each item
A = Number of farmers that ticked agreed in each item
D = Number of farmers that ticked disagreed in each item
SD = Number of farmers that ticked strongly disagreed in each item

The expected range of information needs (NCI) and Problems of production (PCI) were 1 to 480. The mean used for decision was calculated by dividing confrontation index with total number of farmers while mean decision bench mark of 2.5. Correlation (r) and coefficient of determination (R^2) using linear regression analysis were done to determine the influence of demographic data on information needs and constraints. All statistical analysis were performed using IBM SPSS Statistics 23 version at $p \leq 0.05$.

RESULTS AND DISCUSSION

Results (Table 1) showed that male (66.7 %) within the productive ages of 31-40 (46.7 %) were married (80.8 %) and dominate ginger production in Kachia. Majority acquired tertiary education (45 %), and combined farming activities with white collar job (41.7 %), mostly teaching and Local Government workers. Results also revealed maximum household of 41.67 % (4-6 persons) followed by 7-9 (30.83 %) persons, with farming experience of 7-9 years (34.2 %) and 10-13 years (24.2 %). The domination of married male was associated with energy sapping physical and manual activities involved in land clearing, tillage, planting *inter alia* against relatively less activities of weeding, harvesting, processing, marketing and preservation for female (Asumugha, Kormawa and Haan, 2009; Mohammed and Abdulquadri, 2012). Similarly, Ejechi *et al*. (2018) reported lack of funds for high cost of inputs as an important impediment for relatively low women participation while Asumugha *et al.* (2009), supported result of study when they reported average household of six and farm size of 0.75 to 3 ha, jointly owned or only 20 % belonging to women in Southern

Kaduna.

The results implied that most farmers were young and energetic persons, however cultivated small hectare of land, using traditional technology acquired from parents, relatives and older experienced farmers. Earlier, Hassan *et. al*. (2020) reported that educated male farmers dominated crop production in North West. However, majority were not graduate of agriculture/crop production, but Social Studies, Christian Religious Studies, Languages and Linguistics, Home Economics, Islamic Studies among others at Nigeria Certificate in Education, Polytechnic and University levels. Such educational attainment no doubt facilitates information acquisition, understanding and training. Earlier, Omofonmwan and Kadiri (2007) reported that literacy level of farmers determined the rate of diffusion and responsiveness to innovation while Effiong (2005) reported that large family size enhances labour availability. The farming experience of 7-13 years indicated good average knowledge of ginger cultivation base on the positive relationship between experience and production (Alfred, Kayoma and Nwokoye, 2018). It was also established that age, farming experience, educational background and use of improved ginger variety increased technical efficiency, increase yield, increased profit and socioeconomic livelihood of farmers in Kaduna (Ayodele and Sambo, 2014).

Table 1: Demographic information of Ginger Farmers in Kachia Local Government Area, Kaduna State, Nigeria, 2022.

N = 120

S/No	Characteristics		Frequency	Percentage (%)
1.	Sex:	Make	80	66.67
		Female	40	33.33
2.	Age	< 20	05	04.16
		20-30	19	15.83
		31-40	56	46.67
		41-50	26	21.67
		>50	14	11.67
3.	Marital Status:	Single	10	08.33
		Married	97	80.83
		Divorced/Sp	06	05.00
		Widower/Widow	07	05.83
4.	Educational Status:	Non-Formal	06	05.00
		Primary	07	05.83
		Secondary	40	33.33
		Technical	13	10.83
		Tertiary	54	45.00
5.	Occupation:	Farming	41	34.17
		Farming/Trading	29	24.17
		Farming/Civil Servant	50	41.67
6.	Family Size:	<1-3	09	07.50
		4-6	50	41.67
		7-9	37	30.83
		10-13	17	14.17
		14-16	02	01.67
		>16	05	04.16
7.	Farm Size:< 1 acre		29	24.17
		1-9acre	38	31.67
		1-2ha^{-1}	35	29.17
		3-4ha^{-1}	12	10.00
		>5ha^{-1}	06	05.00
8.	Farming Experience:	1-3	05	04.16
		4-6	13	10.83
		7-9	41	34.17
		10-13	29	24.17
		14-16	14	11.67
		>16	18	15.00

In Table 2, sources of information acquisition was dominated by parents, friends and experienced farmers, a clear evidence of local and traditional approach, hence are subsistence and low income farmers. Onwusiribe *et al*. (2018) reported that ginger farmers in the north were smallholders, challenged by inadequate land for mechanical production and poor income in an input expensive environment. The organization of field days and agricultural shows ranked second with 12.68 %, an activity controlled and managed by experienced farmers in collaboration with invited scientist and extension officers where necessary. Similarly Omodara, Onwunali and Hiikyaa (2020) reported that parents and friends dominated crop production in Kauru, Kaduna State. Sources such as Mass and Printed Media and Extension agents were relatively low, contrary Bhagat, Nain and Narda (2004) where extension agents,

television and radio dominated sources of information than agricultural technology due to poor educational level of farmers. This may be associated with inadequate and or insufficient extension services in Kachia (Hassan *et al*., 2020).
Earlier, radio and television dominated sources of information (Sunuga, Beins, Conway and Naylor, 2020). The contrary observation of the study may be associated to the rural environment, irregular power supply, and in most areas, complete absence of electricity to power the media, and where available is not consistent to encourage farmers towards using media such as radio and television for agricultural purposes (Zarmai, Okwu, Dawang and Nankat (2014), couple with relatively low agricultural programmes from such sources.

Table 2: Sources of Ginger Production Information Acquisition in Kachia, Kaduna State, Nigeria, 2022

N = 120

S/No.	Source	F	%
1	Parents, Friends and Experienced farmers	110	39.86
2	Field Days and Agricultural Shows	35	12.68
3	Non-Governmental Organization	33	11.96
4	Farmers' Based Organization	33	11.96
5	Extension Agents	23	8.83
6	On-Farm Farm Demonstration	23	8.33
7	Mass and Printed Media	19	6.88
	Total	276	100.00

Multiple Choice is allowed , F = frequency of occurrence, N = total number of farmers used, % = percent

The information needs (Table 3) revealed average confrontation index of 366.93 and mean of 3.06 in a NCI of 1-480 and mean of 2.19-3.84, indicating that although the farmers were experienced, six and seven of the 14 items were needed and rarely needed, respectively with the exception of irrigation and water management (2.19) that was not needed. Cultivation of ginger is mostly during cropping season and due to lack of facilities for irrigation and water management, farmers presumed negligence on irrigated ginger. Earlier, Ejechi *et al*. (2018) reported planting on bed and ridge for rain fed and irrigated ginger, respectively in Southern Kaduna. Irrigation facilities, facilitated production and reduce post-harvest damages particularly with the recent increase in cultivated land (dailytrust/why-nigerias-ginger-output-is-low).

Pest management (462:3.85), soil fertility (461:3.84) and market information (431:3.59) were most needed information. Information on diseases, insect pests and weeds is lacking, but farmers were ignorant of management measures for leaf blight, seedling rot, die back, rhizome rots and infestation of mandibulated insects which are common pests in Kachia. Pests accumulation may have been due to cultural practice of mulching with infected plant materials and abandoning weeded materials after weeding for erosion control, conservation of soil moisture and improvement of soil nutrient (Ibrahim, 2018). Pathogens and insect eggs and larvae are known to over season in such material, hence encourage population built up of pests over time. Although Kachia soil supports production of ginger, the haphazard use and application of different fertilizers over years has depleted the soil. Hence the need for information on required fertilizer(s), rate of application and availability at subsidized prices for sustainable production (Ibrahim 2018). According to Ayodele and Sambo (2014), cost of external input and input mobilization were major needs of farmers in Southern Kaduna. They established that, proportionate increase in input will increase output by 350 %, if favourable policy and farmers collaboration with cooperative society are encouraged.
On marketing information, most farmers were not disposed due to poor processing techniques of parallel slicing of fresh ginger rhizomes with knife and drying due to lack of mechanical process for value added to produce (NdaNmadu and Marcus, 2011; Onwusiribe *et al*., 2018). Earlier, reports showed that improved production, post-harvest technology and adequate information on credit facilities, processing at local level, bad activities of the middle men, lack of direct access to international market, market glut, fertilizer and abnormal rainfall were paramount problems of farmers, hence needs training and information to combat the issues (Tologbonse, Fashola and Obadiah 2008; Alfred *et al*., 2018; Ibrahim, 2018). Poor financial status and inadequate storage facilities often predispose farmers to forceful disposal of the produce to middle men. Such men reprocess, store and sell at high profit depending on time and demand. Therefore adequate training on processing to reduce post-harvest damage and marketing of the produce is imperative in the livelihood of farmers.
On use of machinery, formation of co-operative society and extension agents, farmers were aware of the advantages, and indicated interest and assistance on the need to improve the services. Results revealed that farmers were experienced on planting operation (2.61) and seed (rhizome) management (2.97), but requires fertilizer subsidy and availability to increase production. However, report have shown that low quality and low use of technology constituted major impediment (medium.com/@thriveagric, 2020) while Ejechi, *et al*. (2018) advised stakeholders in input agencies to intensify efforts towards training of farmers in functional and sustainable agronomic strategies.

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Table 3: Ginger Production Information Need of Farmers in Kachia Local Government Area, Kaduna State, 2022

N = 120

S/No.	Information Needs	HN	N	RN	NN	NCI	$\bar{x}$	Decision
1	Pest, Weed and Disease Management	420	39	2	1	462	3.85	N
2	Soil Fertility /Fertilizer	420	36	4	1	461	3.84	N
3	Marketing Information	352	60	14	5	431	3.59	N
4	Sources of Credit	232	102	30	13	377	3.14	N
5	Improved Ginger Rhizomes	212	123	26	13	374	3.12	N
6	Improved Management Techniques	200	111	44	11	366	3.05	N
7	Seed Rhizome Management	192	108	40	16	356	2.97	RN
8	Post-Harvest Management Techniques	172	120	52	11	355	2.96	RN
9	Storage Facilities	168	114	54	13	349	2.91	RN
10	Co-operative Societies	172	102	56	15	345	2.88	RN
11	Extension Services	140	138	56	11	345	2.88	RN
12	Access to Farm Machinery	172	81	74	13	340	2.83	RN
13	Planting Operations	120	102	70	21	313	2.61	RN
14	Irrigation and Water Management	84	81	52	46	263	2.19	NN
						366.93	3.06	

HN = Highly Needed, N= Needed, RN= Rarely Needed, NN= Not Needed, NCI= Needs Confrontation Index, $\bar{x}$ = mean

Demographic information of farmers at different levels significantly ($p \leq 0.05$) showed positive coefficient with information needs, except for educational status and farming experience that were not significant due high efficiency in such areas (Table 4). Implicitly, sex, farm size and family size contributed 84.7 %, 72.8 % and 70.7 %, respectively to information needs, and therefore highly (sex) and moderately (farm and family sizes) influenced information needs. Educational status and Farming experience were not strong factors to information needs and contributed low influence of 17.7 % and 37.5 %, respectively. Contrarily, Ejechi *et al*. (2018) reported that farming experience was a useful tool for ginger production in Imo and Abia States. This may be probably due to high technical efficiency in Kaduna ginger farmers acquired over time that has improved their education and experience, unlike in the Eastern Nigeria where production is alien and farmers are relatively few.

Table 4: Linear regression coefficient of determination estimates of demographic factors of ginger farmers' information needs in Kachia Local Government, Kaduna State, Nigeria

Demographic data	Coefficient	Std Erro	R^2	Sig.
Sex	0.104	0.062	0.847	0.000^{***}
Age	0.246	0.084	0.437	0.043^{*}
Marital Status	0.400	0.132	0.458	0.034^{*}
Educational Status	0.164	0.107	0.177	0.343^{ns}
Occupation	0.224	0.072	0.653	0.003^{*}
Family Size (number)	0.305	0.060	0.707	0.001^{**}
Farm Size (acre/hectare)	0.234	0.053	0.728	0.001^{**}
Farming Experience (years)	0.184	0.072	0.375	0.070^{ns}

*Std erro = Standard error, R^2 = coefficient of determination, *significant at ≤ 0.05, **significant at ≤ 0.001, ***significant at ≤ 0.000*

In Table 5, demographic data of farmers positively and significantly correlated to information needs with the exception of educational status that was not significant. On the other hand, the positive and significant observed with sex, occupation and farm size indicated strong influence to the problems militating against information acquisition. Age, marital status, educational status, farm size and farming experience were positive but not significant, which indicated that such factors though important, had relatively less influence to problems in information acquisition in ginger production value chain.

Table 5: Correlation of demographic factor on farmers information needs and problems of information acquisition in Kachia Local government of Kaduna State, Nigeria

Demographic data	NCI (R_1)	PCI (R_2)
Sex	0.697^{*}	0.900^{***}
Age	0.548^{*}	0.037^{ns}
Marital Status	0.583^{*}	0.077^{ns}
Educational Status	0.360^{ns}	0.045^{ns}
Occupation	0.797^{***}	0.589^{**}
Family Size (number)	0.730^{*}	0.107^{ns}
Farm Size (acre/hectare)	0.853^{***}	0.492^{*}
Farming Experience (years)	0.512^{*}	0.042^{ns}

*$R_{1\ and\ 2}$ = correlation, NCI = needs confrontation index, PCI = Problem confrontation index, *significant at ≤ 0.05, **significant at ≤ 0.001, ***significant at ≤ 0.000*

Results (Table 6) indicated that, the 9 identified problems contributed significantly to ginger information acquisition. The average PCI was 388.56 with mean of 3.24 in a PCI range of 1-480 and mean of 2.63-3.63. The major problems were irregular power supply (3.63) followed by inadequate fund for digital information (3.44), poor information dissemination (3.48) and poor educational status of the farmers (3.43). Issues of cultural and language influences ranked relatively low, however, possess problems particularly during marketing. Kachia is dominated by people of same culture and language possibly why the two factors were not major. Although farmers were educated, field experience showed that most farmers were not agricultural bias and therefore affected farming activity particularly in the interpretation of farming

technologies. Farmers are aware of use of digital technology but cannot engage it due to lack of power and facilities (Onwunali, Hassan and Usman, 2020). .

Table 6: Constraints of Information Acquisition on Ginger Production in Kachia LGA, Kaduna State, 2022

S/No	Problems	SA	A	D	SD	PCI	$\bar{x}$	Decision
1.	Irregular Power Supply	304	132	0	0	436	3.63	Accepted
2.	Inadequate Funds for Digital Information	264	138	06	05	413	3.44	Accepted
3	Inadequate Information Dissemination	240	165	04	03	412	3.43	Accepted
4	Poor Educational Status of Farmers	248	156	04	04	412	3.43	Accepted
5	Digital and Online Information	204	147	12	14	377	3.14	Accepted
6	Traditional Information	204	135	22	13	374	3.12	Accepted
7	Language Influence	156	129	34	21	340	2.83	Accepted
8	Cultural Influence	154	105	24	32	315	2.63	Accepted
	Total Grand Mean (x)					388.56	3.24	Accepted

SD = Strongly agreed, A = Agreed, D = Disagree, SD = Strongly disagreed, $\bar{x}$ = mean

Conclusion

The need to sustain production for improved livelihood of ginger farmers in Kachia is very necessary as current production stands at subsistence level due to traditional technology and poor sources of information acquisition, hence impeding standard of living of farmers and Federal Government plans for self-sufficiency. Therefore, farmers need to be encouraged towards digital agriculture through a standard extension services, acquisition and application of right fertilizer, pests and weed management *inter alia* to empower farmers decision making capacities and foster an enabling environment for ginger production. Adequate knowledge of farmers to cultivation practices, market information,, processing techniques, resource availability and sustainability, through dedicated and committed stakeholders is imperative for sustainable livelihood of farmers in Kachia.

Recommendation

The study recommended the following for sustainable ginger production in Kachia:

Based on the wide gap between the male and female participation, there is a need to encourage females through good policies on land ownership and acquisition, and loans to enable active participation by cultural heads and State Government

There is a need for effective extension services for up-to-date information in marketing, and pest and weed management, as such information is presently inadequate for sustainable ginger production. Government at State and Local Government, as well as Non-Governmental Organizations should employ more professional Extension Staff to solve the problem of information needs.

- Based on the depreciating soil fertility, poor irregular power and inadequate funds for digital information, the stakeholders, State, Local Government and Non-Governmental Organizations should encourage and assist farmers..
- Since majority of the farmers were educated, though not in agriculture, there is a need for training and retraining, through demonstration farm, field shows and exhibitions for adequate skill acquisition in ginger production by stakeholders in ginger production, particularly the Local Government and NGOs
- Based on poor financial background of the farmers, there is a need for stakeholders (NGOs, Bank of Agriculture, Government at all level etc) to assist farmers with credit facilities and inputs towards their farming activities. Such can also be done through subsidy and low interest loans
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