International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 12, Issue 10, 2020, pp.-9883-9887.
Available online at https://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BPJ0000217

Research Article

RELEVANCY OF FARM INFORMATION SOURCES AND KNOWLEDGE LEVEL OF FARMERS ABOUT CLIMATE SMART AGRICULTURAL (CSA) PRACTICES: STUDY IN FLOOD VULNERABLE AREAS IN ASSAM

BARMAN S.[1]*, NEOG P.K.[2], HAZARIAKA C.[3] AND PATHAK P.K.[4]
[1]Department of Extension Education, Faculty of Agriculture, Assam Agricultural University, Jorhat, 785013, Assam, India
[2]Director Extension Education Institute (NER), Assam Agricultural University, Jorhat,785013, Assam, India
[3]Rev. Pough Central Library, Assam Agricultural University, Jorhat, 785013, Assam, India
[4]Directorate of Extension Education, Assam Agricultural University, Jorhat, 785013, Assam, India
*Corresponding Author: Email - sbarman72@gmail.com , sundar.barman@aau.ac.in

Received: May 03, 2020; Revised: May 24, 2020; Accepted: May 26, 2020; Published: May 30, 2020

Abstract: The study was carried out in four vulnerable districts to flood of Assam to assess the relevance of farm information sources and the level of knowledge about CSA practices introduced under the NICRA project. All total 400 participant farmers were selected by following proportionate random sampling methods. Appropriate statistical methods are used for analysis and interpretation of data. The findings revealed that most respondents (60 percent) had a medium level of relevance to farm information sources. At the same time, the "peer group" was ranked as first followed by "progressive farmers" as the second rank and "AEA" as the third rank in terms of relevancy among the ten different sources of farm information with mean score 4.76, 4.43 and 3.32 respectively. The findings of the knowledge level of respondents on selected CSA practices *viz*. vermicompost preparation and application (VC), integrated nutrient management (INM), minimum tillage (MT) integrated pest management (IPM), and stress tolerance varieties (STVs) were found the medium level for majority respondents ranging in between 64 percent to 76 percent. Local sources of information were found to be more critical, and hence, the two-step communication flow model might be more appropriate for advisory services in vulnerable areas to flooding. NICRA's intervention might be to help farmers in enhancing knowledge about CSA practices, and there is a scope to further improve the knowledge of farmers by putting more such efforts.

Keywords: *Relevancy of farm information source, Knowledge, Climate Smart Agriculture*

Citation: Barman S., *et al*., (2020) Relevancy of Farm Information Sources and Knowledge Level of Farmers about Climate Smart Agricultural (CSA) Practices: Study in Flood Vulnerable Areas in Assam. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 12, Issue 10, pp.- 9883-9887.
Copyright: Copyright©2020 Barman S., *et al*., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.
Academic Editor / Reviewer: Navin Kumar Rajpal, Medini Ibrahim

Introduction

Agriculture plays a crucial role in the overall economic and social wellbeing of India. There is now evidence of an observed increase of global temperature and change of rainfall rate during the 20th century throughout the world [1-3]. The impact of climate change on agriculture and food security is a significant concern for UNO and considered as one of the important goals of millennium development goals. Without urgent action, climate impacts could push an additional 100 million people into poverty by 2030 [4]. On the other hand, more than 60% of the total cropped area is still rainfed and dependent on the uncertainties of monsoon. The southwest monsoon is critical to the kharif crop, which accounts for more than 50% of the food-grain production and 65% of the country's oilseeds production. The interannual monsoon rainfall variability in India leads to large-scale droughts and floods, resulting in a significant effect on Indian food grain production [5-6] and on the economy of the country[7].

In this context, issue is how productivity can be increased while ensuring the sustainability of agriculture and the environment for future generations. Along with the people who manage them, they become more resilient to changes and shocks [8]. If the approach to planning and investment for agricultural growth and development is not changed, then there will be a risk of misallocating human and financial resources, generating agriculture system incapable of supporting food security and contributing to increasing climate change. Farmers' knowledge about CSA practices helps to choose the best options in their situation. In Assam, four districts were identified as vulnerable to climate change, especially for flood and National Innovations on Climate Resilient Agriculture (NICRA) project was implemented since 2011.

Farmers of these districts were delivered farm information through the various information sources for getting their need-based information about technologies and other management aspects. Right, and relevant source of information is must to equip them to address the impact of climate change. Both public and private sources of farm information were available to farmers, but access to farmers and the utility of this information is a matter of concern many times. Knowledge is the first and indispensable step of the adoption process [9]. A number of farm information sources might be available within their locality or outside the area, but relevant sources are essential, which augment the process of gaining knowledge about CSA practices by the farmers and ultimately enhance the adoption process. Thus, identification of pertinent farm information sources in farmers' perspective and analyze the knowledge level of farmers about CSA practices in flood vulnerable areas of Assam is an attempt of the present study.

Material and Methods

Study area and sample collection

The present study was carried out in four districts of Assam representing four agro-climatic zones, namely Upper Brahmaputra valley zone, North Bank Plain Zone, Lower Brahmaputra Valley Zone, and Barak valley Zone. The four districts Dibrugarh, Sonitpur Dhubri, and Cachar were purposively selected where Krishi Vigyan Kendras of respective district implemented NICRA Project since 2011. From each district, one village was selected purposively where activities of the NICRA project were implemented. The four villages, namely Namtemera missing gaon, from Dibrugarh district, Punioni Baghchung from Sonitpur District, Udmari

Table-1 *Distribution of respondents according to relevancy of information source, N=400*

SN	Category	Range of relevancy score	Frequency	Percentage	Mean relevancy score	SD	CV
1	Low	Below 20	114	28.50			
2	Medium	20-40	240	60.00	26.48	10.14	0.38
3	High	Above 40	46	11.50			
	Total		400	100.00			

Table-2 *Ranking of sources of farm information based on mean scores, N=400*

SN	Source of farm information	Weightage mean score			Relevancy Mean score	Rank
		Availat	Accessible	Utilized		
1	Progressive farmers	1.53	1.48	1.43	4.43	II
2	Peer group	1.63	1.60	1.53	4.76	I
3	AEA	1.19	1.13	1.01	3.32	III
4	KVK scientists	1.16	1.00	0.94	3.09	IV
5	Input dealers	0.79	0.69	0.64	2.11	VII
6	Mass media	1.46	1.00	0.56	3.01	V
7	ICT based Extension	1.09	0.76	0.30	2.15	VI
8	News paper	0.90	0.49	0.24	1.62	VIII
9	NGO personnel	0.29	0.29	0.21	0.79	X
10	PVT companies	0.45	0.39	0.39	1.22	IX

Table-3 *Distribution of respondents according to their knowledge on selected CSA practices, N=400*

SN	CSA Practices	Level of Knowledge			Mean	SD	CV
		Low	Medium	High			
1	VC	61(15.25)	303(75.75)	36 (9.0)	5.22	0.91	0.17
2	INM	62(15.50)	266(66.50)	72(18.0)	5.58	1.16	0.21
3	MT	65(16.25)	259(64.75)	76(19.0)	5.13	1.38	0.27
4	IPM	65(16.25)	241(60.25)	94(23.50)	5.48	1.27	0.23
5	STVs	52(13.0)	281(70.25)	67(16.75)	4.81	1.42	0.29
6	Over all	73(18.25)	276(69.0)	51(12.75)	26.21	3.05	0.12

**Low= < x-σ, Medium = x-σ to x+σ, High = > x+σ; Figure in parenthesis indicates percentage, VC= Vermicompost preparation and application, INM= Integrated Nutrient Management, MT= Minimum Tillage , IPM= Integrated Pest Management, STVs= Stress Tolerant Varieties*

part IV village from Dhubri district, and Salchapra-I from Cachar district were selected for the present study. Altogether 400 participating farmers of the NICRA Project were selected as sample respondents by following proportionate random sampling methods from each village.

The relevancy of farm information sources was studied in terms available, accessible, and utilizable for a respondent. A list of farm information sources had been prepared after reviewing literature and discussion with extension experts of KVKs. The identified information sources were Progressive farmers, Peer group of farmers, Agriculture Extension Assistant (AEA), KVK scientists, input dealers, mass media, ICT based extension, newspaper, Non-Government Organization (NGO) and Company personnel. The availability of farm information sources for a respondent was measured by collecting responses in the three-point continuum as 'easily available', 'some time available' and 'not available' and score was assigned as 2, 1, and 0, respectively. The response on the accessibility of farm information source was collected in the three-point continuum as 'easily accessible,' 'accessible,' and 'not-accessible' and score was assigned as 2, 1, and 0, respectively. Likewise, the response to the utilization of farm information source was collected in the three-point continuum as 'fully utilized,' 'partially utilized', and 'not utilized'; the score was assigned as 2, 1, and 0, respectively. Thus, the total score for farm information source applicability is calculated by following formula-

Wtg FIS(rvy) = Wtg FIS(*avail*) + WtgFIS(*access*)+ WtgFIS(*use*)

Where WtgFIS(*avail*)= fxi x2 + fxi x1+ fxi x 0

WtgFIS(*access*)= fxi x2 + fxi x1+ fxi x 0

WtgFIS(*use*)= fxi x2 + fxi x 1+ fxi x 0

Where,

Wtg FIS(*rvy*)= Weightage score of Farm Information Source's relevancy

WtgFIS(*avail*) = Weightage score of Farm Information Source's availability

WtgFIS(*access*) = Weightage score of Farm Information Source's accessibility

WtgFIS(*use*) = Weightage score of Farm Information Source's utilization

fxi = Frequency of x^{th} respondents of i^{th} information source

Based on the relevancy score of the farm information source, respondents were categorized as a low, medium, and high with scores below 20, 20-40, and above 40, respectively.

In order to rank farm information sources, mean weightage farm information source's relevancy score was calculated by using the following formula.

$$Mean\ Wtg\ FIS(rvy) = \frac{Wtg\ FIS(_{avail}) + WtgFIS(_{access}) + WtgFIS(_{use})}{N}$$

The respondents' level of knowledge on selected CSA practices was measured with the help of the knowledge test constructed and standardized for this purpose. After reviewing the report of four KVKs from 2011-12 to 2013-14, consultation of concern KVK scientists and Scientists of Assam Agricultural University 5 (five) CSA practices were selected for assessing the knowledge level of farmers implemented in all four KVKs during 2011 to 2013. The CSA practices were namely 'vermicompost preparation and application' (V.C.), 'integrated nutrient management' (INM), 'minimum tillage' (M.T.) 'integrated pest management' (IPM) and 'stress-tolerant varieties' (STVs). The answers for question in the final knowledge test were in dichotomous form. While administering the final knowledge test, 1 score had been assigned to correct answer to an item and 0 for incorrect answer. Thus, total score of the test had a range of 0- 45. Appropriate statistical methods were used for the analysis of data.

Results and Discussion

Relevancy of Farm Information Sources

The relevancy of farm information source was measured as the summation of availability, accessibility, and utility of farm information sources. [Table-1] reveals that most respondents (60 percent) had a medium level of relevance to farm information sources. That is, 60 percent of respondents had a medium level of farm information source availability, accessibility, and utility. The next higher percentages of respondents (28.50 percent) were found in the low-level category. The high level of relevancy of farm information source was found for 11.50 percent of respondents.

The level of utilization of farm information source for majority farmers was medium level [10-11]. The data related to this variable were skewed toward the lower category indicating a low level of relevancy. The variation among the respondents was found as a moderate degree (CV, 0.38).

Ranking of farm information sources based on relevancy

From [Table-2], it is cleared that "peer group" was ranked as the first followed by "progressive farmers" as the second rank in terms of farm information source applicability among the ten different sources of farm information with mean score 4.76, and 4.43. The "AEA" and "KVK scientists" occupied the 3rd and 4th rank with a mean score of 3.32 and 3.09. The 5th and 6th rank were held by "mass media (3.01) and "ICT based extension (2.15)". The 7th rank was occupied by the "input dealers" with a mean score of 2.11. The "newspaper", "private company peoples" and "NGO" were ranked as 8th, 9th and 10th respectively in terms of farm information source applicability. The findings are corroborating with the earlier findings [12-13]

It may be inferred from [Fig-1] that local farm information sources like peer group and progressive farmers were readily available, accessible, and applicable for most of the farmers compared to cosmopolite farm information sources AEA, KVK scientists. The ICT based extension and mass media also had easy availability and accessibility, but no easy applicability. Among the private source of the farm information source, input dealers were more readily available, accessible, and applicable than private company people. This may be due to farmers of the study areas less degree of cosmopolite, have low literacy level, low level of exposure to ICT or mass media or do not use mass media for accessing agricultural information.

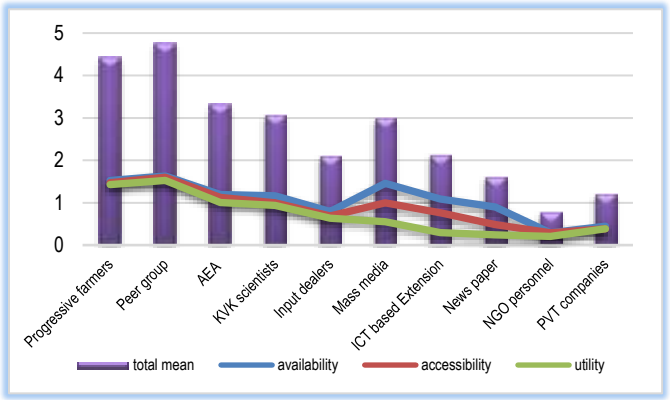

Fig-1 Distribution of respondents according to mean weightage score of farm information sources

Knowledge about Climate Smart Agriculture (CSA) Practices

The knowledge of farmers about Climate Smart Agriculture (CSA) practices was assessed by following knowledge test framed for this purpose in terms of five selected CSA practices. The findings of the knowledge level of respondents on selected CSA practices *viz*. vermicompost preparation and application (V.C.), integrated nutrient management (INM), minimum tillage (M.T.) integrated pest management(IPM), and stress tolerance varieties (STVs) are presented in following paragraphs

In the case of vermicompost preparation and application (V.C.), the majority of the respondents (75.75 percent) had a medium level of knowledge, followed by 15.25 percent who had a low level of knowledge. Only 9 percent of respondents had a high level of knowledge on vermicompost preparation and application [Table-3]. The distributions of respondents were skewed towards a low level of knowledge. The mean value of 5.22 indicates that the average knowledge of farmers was of medium level. The low CV value of 0.17 indicates weak variation among respondents in respect to this variable. It may be inferred that farmers had a medium level of knowledge about vermicompost preparation and application. This may be due to constant contact with institutions, participation in training, and technology demonstration programmes.

It is observed from [Table-3] that knowledge on Integrated Nutrient Management (INM) was of medium level for majority respondents (66.50 percent). The next majority of respondents in regards to knowledge on INM having high and low-level categories were 18.50 percent and 15.50 percent, respectively. It is evident that the distribution of respondents was skewed towards a high level of knowledge. The mean value of 5.58 and CV value of 0.21 indicates that respondents' average knowledge was of medium level with a weak variation.

[Table-3] reveals that the majority of the respondents (64.75 percent) had a medium level of knowledge about minimum tillage operation, followed by a high level of knowledge (19.00 percent). The mean value of 5.13 indicates that the average knowledge on minimum tillage operation was in the medium category, and CV value (0.27) implies there was weak variation among the respondents. The distributions of respondents were skewed towards the higher category of knowledge level.

It has been seen from [Table-3] that the majority of the respondents (60.25 percent) had a medium level of knowledge about IPM followed by a high level with 23.50 percent. The rest percentage had a low level of knowledge about IPM. It may be concluded that the distribution of respondents was skew towards a higher category in terms of knowledge about IPM. The mean value (5.48) indicates a medium level of knowledge about IPM for average farmers. There was weak variation among the respondents in terms of this variable (CV, 0.23)

The majority of the respondents (70.25 percent) had a medium level of knowledge about stress-tolerant rice varieties, which were also reflected by the average knowledge score (4.81). The high and low level of knowledge with respect to this variable was found for 16.75 percent and 13.00 percent respondents, respectively [Table-3]. The distribution of respondents in the term's category was skewed towards the higher end.

It is observed from [Table-3] that overall knowledge on selected CSA practices was of medium level for the majority of the respondents (69.00 percent) followed by18.25 percent, respondents, with a low level of knowledge. The rest 12.75 percent of respondents had a high level of knowledge on overall CSA practices. The mean value of 26.21 indicates average knowledge of respondents on overall CSA practices was of medium level, but the distribution of respondents in terms of overall knowledge on CSA practices was skewed towards the lower category. The CV value of 0.12 indicates weak variation among the respondents in terms of overall knowledge level.

It may be inferred from the data set of overall knowledge about CSA practices that though farmers had a medium level of knowledge but were concentrated on the lower end of medium range of knowledge score. This may be due to lack of contact with the institution responsible for conducting training on CSA practices or lack of emphasis by the concerned institution for organizing need based training programme or poor follow up action of concerned institutions or improper selection of respondents or lack of concern about effect of climate change on the parts of farmers and concerned government and non-government organizations.

It is also evident from [Table-3] that most of the respondents had a medium level of knowledge about all five selected practices followed by a high level of knowledge. But in the case of V.C., that was followed by a low level of knowledge. The knowledge about various aspects of vermicompost preparation and application are presented in [Table-4]. Out of nine aspects of vermicompost technology, more than 80 percent of respondents correctly answered about characteristic features, ideal locations for the tank, ingredients used for preparation and its procedures, and releasing of earthworm in the tank. Only a few farmers had knowledge about the dose of application, the height of the tank, and sources of suitable earthworm species. Again, knowledge of respondents on important aspects of INM is depicted in [Table-4]. It is evident from the Figure that important elements of INM like green manuring crops were well known to more than 90 percent of the respondents. Soil testing and soil health cards were the important aspects where around 70.00 percent respondents had correct knowledge. The next majority of respondents i.e., more than 60.00 percent, had knowledge about inorganic fertilizers, FYM, and its application. But the knowledge about the stage of harvest and application of green manure crop and benefit of recycling waste materials were found with less than 35 percent of respondents. This may be attributed to the fact that farmers had knowledge about the general aspect of INM, but specific knowledge on applications such as the right time of application and harvesting of green manuring crops and the benefit of recycling of waste were not appropriately known. This may be due to a lack of emphasis for extension agencies to clarify the principles of technologies to farmers or giving emphasis on the skill development part of the technologies. But, knowledge about the rationale behind the use of technology can help expedite the adoption of technology. The finding is corroborated with the results of Kishore (2014).

Again, most of the respondents had correct knowledge about different aspects of minimum tillage operation. More than 80.00 percent of respondents knew about the meaning and benefits of minimum tillage, while more than 60.00 percent of respondents knew about crops can be grown, suitable soil for minimum tillage [Table-4]. Knowledge about minimum tillage or zero tillage operation was practiced as traditional farming methods by most of the farmers for a long time considering the land and soil type.

Further, [Table-4] reveals that more than 90.00 percent of the respondents knew about cultural, biological, and mechanical control measures of pest management. In comparison, less than 80.00 percent of respondents knew about indicators of pesticide application and beneficial insects. But some important aspects of IPM like a chronology of use of control measures, contact, and organic pesticides were not known by majority respondents. This may be attributed to the fact that farmers had knowledge on those aspects of IPM, which were practiced as traditional knowledge, but those aspects developed through research or relatively knew for farmers were less known to them. Again, for the selection and application of pesticides, farmers mostly depend on input dealers or fellow farmers.

Table-4 *Distribution of respondents according to their knowledge on different aspects about selected CSA practices, N=400*

SN	Aspects of CSA	Correct response (%)
I	VC	
1	In what fertilizer type vermicompost is categorized	93.00
2	Ingredients used to prepare vermicompost	96.25
3	Sources of collection of earth worm	31.25
4	Materials used for preparation of vermin bed	96.75
5	Height of vermicompost tank	16.50
6	Ideal site for vermicompost tank	85.25
7	Use of waste materials for vermicompost	88.25
8	Indicators of collection of vermicompost	8.00
9	Dose of vermicompost application	6.50
II	INM	
1	Green Manuring (GM)crops	100.00
2	Application method of GM in the field	33.50
3	Harvesting of GM crop	32.50
4	Nutrients contents of GM crops	90.50
5	Purpose of soil testing	72.50
6	Applicability of soil health card	72.00
7	Benefit of recycling crop waste in the field	26.50
8	Inorganic nitrogenous fertilizers	68.50
9	Right time to use FYM in the field	61.50
III	MT	
1	Type of tillage used for land preparation	65.00
2	Meaning of minimum tillage	89.00
3	crops can be grown with minimum tillage	73.00
4	Meaning of zero tillage	80.50
5	Benefit of minimum tillage	84.00
6	Suitable Soil type for minimum tillage operation	73.00
IV	IPM	
1	Right time for application of pesticide	75.25
2	Cultural methods of pest management	92.50
3	Biological methods for pest management	95.00
4	Mechanical control measures for pest management	100.00
5	Contact pesticide	28.75
6	First control in IPM practices	36.50
7	Organic pesticide	19.50
8	Beneficial insect for crop	79.50
V	STVs	
1	Medium duration flood tolerant rice varieties	51.75
2	Short duration varieties suitable for flood affected area	85.25
3	Sowing time of flood tolerant HYV rice	79.25
4	Ideal seedling age of flood tolerant HYV rice	90.00
5	Average duration of flood tolerant rice varieties	77.75
6	Average days of submergence tolerance by STV rice	44.75
7	Seedling per hill in transplanting of rice	22.25

[Table-4] also reveals that ideal age of seedlings and names of short duration flood-tolerant rice varieties were known by more than 80.00 percent of respondents while the duration and time of the sowing of STVs were known to more than 70.00 percent respondents. But some important aspects like names of medium duration STVs, duration of submergence tolerant, and an ideal number of seedlings for STVs were not known to the majority of farmers.

Conclusion

A local source of information was found to be more critical, and hence, the two-step communication flow is more appropriate. Village key persons should be identified following proper social techniques and utilized as a bridge to establish the relationship between development departments and farmers. Knowledge about selected CSA practices was found to be moderate for the majority of farmers. A considerable proportion of farmers in the study area had a low level of knowledge. So, the NICRA's intervention could contribute to enhancing experience about CSA practices, and there is a scope to further improve the understanding of farmers by putting more such efforts.

Application of research: This study helps to identify pertinent farm information sources at farmer's perspective in flood vulnerable areas and enhance dissemination of CSA practices among farming community in flood vulnerable areas.

Research Category: Relevancy of Farm information, Farmers knowledge about CSA practices Flood vulnerable areas

Abbreviations: CSA = Climate Smart Agriculture
NICRA= National Innovations on Climate Resilient Agriculture
VC= Vermicompost preparation and application
INM= Integrated Nutrient Management
MT= Minimum Tillage
IPM= Integrated Pest Management
STVs= Stress Tolerant Varieties

Acknowledgement / Funding: Authors are thankful to Directorate of Post Graduate Studies, Assam Agricultural University, Jorhat,785013, Assam, India

****Principal Investigator or Chairperson of research: Dr Sundar Barman**
University: Assam Agricultural University, Jorhat,785013, Assam, India
Research project name or number: Research station study

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Assam

Cultivar / Variety / Breed name:

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

References

[1] IPCC, (2001) *Climate Change 2001. The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK*
[2] Jung Hyun-Sook, Choi Y., Oh Joi-ho and Lim Gyu-ho (2002) *International Journal of Climatology*, 22, 1327-1337.
[3] Balling Jr.R.C. and Cerveny R.S. (2003) *Natural Hazards*, 29, 103-112.
[4] Zenghelis D. (2006) *Stern Review, The economics of climate change. London, England, HM Treasury.*

[5] Selvaraju R. (2003) *International Journal of Climatology*, 23,187-206.
[6] Kumar K.K., Kumar K.R., Ashrit R.G., Deshpande N.R. and Hansen J.W. (2004) *International Journal of Climatology*, 24(11), 1375-1393.
[7] Gadgil S., Abrol Y.P. and Rao, Seshagiri P.R. (1999) *Current Science*, 76 (4),548-556.
[8] FAO (2013) *Climate-Smart Agriculture Sourcebook, Food and Agriculture Organization of the United Nations*, 2013.
[9] Agbamu J.U (2006) *Essentials of Agricultural Communication in Nigeria. Lagos, Malthouse Press Limited*
[10] Ikheloa E.E., Ikpi A.E., Ikpi V.O. and Oluwatayo I.B. (2013) *Ethiopian Journal of Environmental studies and management*, 6(6), 630-369.
[11] Owombo P.T., Akinola A.A., Ayodele O.O. and Koledoye G.F. (2012) *Journal of Agriculture and Biodiversity Research*, 1(2), 25-32.
[12] Yassing M., Barman S., Barua P. and Bordoloi N. (2016) *Progressive Research – An International Journal*, 11(3), 309-312.
[13] Egge M., Tongdeelert P., Rangsipaht S. and Tudsri S. (2011) *Kasetsart Journal (Social Sciences),* 32,319-326.