International Journal of Ecology and Environmental Sciences
www.ecologyjournal.in
Online ISSN: 2664-7133; Print ISSN: 2664-7125; Impact Factor: RJIF 5.28
Received: 09-08-2020; Accepted: 29-08-2020; ; Published: 10-09-2020
Volume 2; Issue 3; 2020; Page No. 245-247

Constraints faced by farmers in various agricultural adaptation activities in response to climate change in Jagatsinghpur district of Odisha

Debasmita Nayak[1*], Mita Meher[2], Sushree Purabi Panigrahi[3]
[1] Ph. D Scholar, Department of Extension Education, College of Agriculture, OUAT, Odisha, India
[2, 3] M.sc Scholar, Dept. of Extension Education, College of Agriculture, OUAT, Odisha, India

Abstract
In India, Agriculture and its allied sectors are the largest source of livelihood. Climate and agriculture are interconnected and are deeply affected by each other. In our country, the farmers have been suffering a lot due to climate change and they have to adopt some strategies to overcome the problem but at the same time they face some constraints in adopting such practices. Such a study would contribute towards a better understanding of different types of constraints faced by the farmers in various agricultural adaptation activities in response to climate change. The research study was conducted in Jagatsinghpur district of Odisha taking 120 respondents from Tirtol and Raghunathpur block. From the study it was revealed that among the personal constrains, lack of literacy and understanding is the main problem with a mean score of 3.91 followed by lack of knowledge about how to cope and small land holding with mean score of 3.75 and 3.57 respectively. Similarly, among the institutional constrains, the major constraint was lack of information sources having a mean score of 3.31 and among the technical constrains the main problem was lack of technical know-how with a mean score of 4.16.

Keywords: agricuiture, climate, adoption, constrains

1. Introduction
Like most of the other developing countries, People of India are dependent on its natural resources to a large extent for their livelihood. Agriculture is the main source of economy of the country and climate is the primary determinant of agricultural productivity. In the country, climate change is putting additional stress on the socio economy system as the economy of India is closely tied to its natural resource base. Various studies reveal that the adverse impact of climate change such as change in temperature, rainfall, humidity etc. Causes 10-40 percent of crop loss within a year. To overcome the devastating impact of climate change, people have to adopt some agricultural practices. The capacity to adopt can be influenced by several factors like access to wealth, scientific and technical knowledge, information, skills, infrastructure etc which appear as constraints for the adaptation practices in response to climate change.
With regards to Odisha, the state is mainly dependent on monsoon rainfall for irrigation and is more prone to natural disaster like cyclone and flood. About 80-90 percentage of people are directly or indirectly dependent on agriculture and its allied sector in Odisha. Our study area Jagatsinghpur district is a coastal district situated near the coast line of Bay of Bengal and has been deeply affected by climate change every year.

2. Materials and methods
For our study we had selected two blocks Tirtol and Raghunathpur from the 8 blocks of Jagatsinghpur district by random sampling method. Then we had selected 8 villages (4 from each block). In the study we had taken the views of 120 farmers who were selected through disproportionate random sampling method from the 8 villages (15 from each village). We had conducted a pilot study and also pre testing of the interview schedule was done taking 10% of the total respondents i.e. 12 number of respondents.
Personal interview and focused group discussion techniques were followed for collection of information.

2.1 Processing and statistical analysis of data
The following statistical methods were used in the study depending on the nature of data

a. Frequency and Percentages
The number of individuals or observations in each class of attributes/variables is called frequency of that class of variable. The arrangement of Frequencies in different classes of variables is called The Frequency distribution of the variables (Gupta, 2000).

$$Percentage = \frac{Numberofrespondentsinacell}{Totalnumberofrespondents} X\ 100$$

b. Mean score
It is an arithmetic average and the result obtained when the sum of values of the individuals in the data divided by the number of individuals in the data.
MS= Σfx/N
Where, M.S. = mean score
Σ x = Sum of total score obtained by the individual
N = Total no. of items / respondents

c. Rank order
On the basis of average mean scores and mean scores, rank order was calculated. The item securing highest average means scores/mean scores was given first rank and then next highest was

given second rank and so on. Ranking was done in the constraints faced by the farmers.

d. Gap analysis

Gap analysis involves the comparison of actual performance with potential or desired performance.

$$\text{Gap percentage} = \frac{\text{Total mean score - Mean score}}{\text{Total mean score}} \times 100$$

3. Result and Discussion

3.1 Socio-economic characteristics of farmers

The socio-personal characteristics are defined on the basis of personal, social, economic characters. Respondents were categorized and their frequency and percentage was calculated for further analysis. From this study (table 1) it is observed that most of the respondent's i.e 40% belong to middle aged category while 38.33% were old aged and 21.66% were young.

The findings reveal that the majority of respondents 34.16% were high school pass out where 7.5%, 13.33%, 21.66%,23.33% were illiterate, could read and write, primary school pass out and college pass out respectively.

As regards the family type, it has been observed that most of the respondents 56.66% belong to the joint family where 43.33% belong to nuclear family.

From this study it is observed that most of the respondents (45.83%) have 20-40 years of experience while 30% have upto 20% experience and 24.16% have more than 40% experience.

Further, the land holding of the farmers reveal that that most of the respondents i.e 60% of the respondents have upto 1 hac of land and 34.16 % and 5.83 % of the respondents have 1-2 hac land and > 2 hac land respectively.

The findings about family income reveal that majority of respondents (40%) have annual income of Rs. 20000-Rs 40000 while 33.33%, 15% and 11.66% have Rs. 40000-60000, >Rs 60000 and below Rs. 20000 respectively.

3.2 Constraints

The present research study also assessed farmers' perception on the constraints experienced by them in using various coping mechanisms to mitigate adverse effect of climate change on agriculture and allied activities.

3.2.1 Personal constraints

Personal constraints act as a road block in the path of development and empowerment of an individual. Illiteracy, ignorance, lack of knowledge may affect the adoption rate of various technologies in response to climate change.

From the table 4.2 it is observed that lack of literacy and understanding has 3.91 of mean score and 65.18 of gap percentage while lack of knowledge how to come and small land holdings have mean scores 3.75 and 3.57 respectively and 66.60 and 68.21 gap percentage of respectively.

In the study area lack of literacy and understanding is the major personal constraint.

3.2.2 Institutional constraints

Different adoption activities requires proper planning, supply of quality inputs timely, labour force, finance, accurate and timely market information. Besides all these proper training, change agent contact, knowledge about government schemes are also necessary for successful management of crop and livestock.

From the table 4.3 it was observed that lack of information sources have highest mean score of 3.31 and 79.44 a gap percentage of, lack of training programmes, lack of govt. policies, lack of credit and lack of extension services have mean scores of 3.23, 3.21, 3.18 and 3.17 respectively with a gap percentage of 79.93, 80.06,80.24 and 80.31 respectively.

In the study area lack of information sources is the major constraints faced by the respondents in adopting different techniques in response to climate change.

3.2.3 Technical Constraints

Technical knowledge is very much required in adopting new practices in response to climate change. Technical knowledge increases the effectiveness and efficiencies of adoption.

From the table 4.4 it is observed that lack of technical know-how has highest mean score of 4.16 and the gap percentage is 64.77 where lack of access to weather forecast and difficulties in shifting cropping pattern have mean scores of 4.03 and 3.62 and gap percentage of .65.87 and 69.34 respectively.

In the study area lack of technical know-how is the major technical constraints in adopting different practices.

Table 1: Distribution of the respondents according to their socio economic characteristics (n=120)

Characteristics	Category	Frequency	Percentage
Age	Upto 35years	26	21.67
	36-50 years	48	40
	> 50 years	46	38.33
Education	Illiterate	9	7.5
	Read and write	16	13.33
	Primary school	26	21.67
	High school	41	34.16
	College and above	28	23.34
Family Type	Nuclear	52	43.33
	Joint	68	56.67
Farming Experience	20 years	36	30
	20-40 years	55	45.84
	>40 years	29	24.16
Land Holding	Upto 1 hac	72	60
	1-2 hac	41	34.16
	< 2 hac	7	5.84
Annual Income	Upto Rs20000	14	11.66
	Rs20000-40000	48	40
	Rs 40000-60000	40	33.34
	>Rs 60000	18	15

Table 2: Distribution of respondents according to the personal constraints faced by them in adopting different strategies in response to climate change

Paricular	Very High	High	Moderate	Low	Very Low	Mean Score	Rank	Gap Percentage
Lack of literacy and understanding	42	45	19	9	5	3.91	I	65.18
Small land holdings	38	42	17	7	6	3.57	III	68.21
Lack of knowledge about how to cope	39	41	20	12	8	3.75	II	66.60
Total mean score						11.23		

Table 3: Distribution of respondents according to the institutional constraints faced by them in adopting different strategies in response to climate change

Paricular	Very High	High	Moderate	Low	Very Low	Mean Score	Rank	Gap Percentage
Lack of extension Services	22	30	35	13	20	3.17	V	80.31
Lack of information Sources	30	30	25	18	17	3.31	I	79.44
Lack of institutional Credit	27	33	20	15	25	3.18	IV	80.24
Lack of Govt. Policy	26	34	21	18	21	3.21	III	80.06
Lack of training Programme	25	30	30	18	17	3.23	II	79.93
Total mean score						16.10		

Table 4: Distribution of respondents according to the technical constraints faced by them in adopting different strategies in response to climate change

Paricular	Very High	High	Moderate	Low	Very Low	Mean Score	Rank	Gap Percentage
Lack of access tom weather forecasting	45	17	18	7	3	4.03	II	65.87
Difficulties in shifting of cropping pattern	30	44	26	11	9	3.62	III	69.34
Lack of technical know-how	61	30	20	6	3	4.16	I	64.77
Total mean score						11.81		

5. Conclusion

In the research area among the personal constraints lack of literacy or understanding has highest mean score i.e. 3.91. Among the institutional constraints lack of information sources is the major constraints having highest mean score of 3.31.Among the technical constraints lack of technical know- how has highest mean score of 4.16.

There was lack of understanding, lack of information sources and lack of technical knowledge in the study area. There is urgent need to undertake the steps towards awareness increasing programs regarding future impacts of climate change and strategies to cope with its adverse effect on agriculture and allied activities

6. References

1. Alam. Climate change perception and local adaptation strategies of rural household of Bangladesh, climate risk management, volume 17, Bangladesh, 2017.
2. Bayord B. The economics of adoption and management of alley croppin gin Haiti. J Environ. Manag, 2007; 85:62-70.
3. Bryan E, Deressa TT, Ringler C. Adaptation to climate change in Ethiopia and South Africa, Options and constraints. Environmental Science and Policy. 2009; 12(4):413-426
4. FAO. Adaptation to climate change in agriculture, forestry and fisheries, Food and Agriculture Organisation of United Nations, Rome, 2007
5. Morton. Assesing farmers' perception about climate change, climate risk management, 2017; 17:123-138.
6. Nhemachhena, Hassan. Micro level study of farmers' adoption strategies to climate change, IFPRI discussion paper no 00714, Washington, 2007.