SHORT COMMUNICATION

ASSESSMENT OF COPPING MECHANISM OF FARMERS TO MITIGATE DISASTER DUE TO CLIMATE CHANGE IN CHHATTISGARH PLAIN

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Abstract : Agriculture places heavy burden on the environment in the process of providing humanity with food and fiber, while climate is the primary determinant of agricultural productivity. Given the fundamental role of agriculture in human welfare, concern has been expressed by federal agencies and others regarding the potential effects of climate change on agricultural productivity. To examine how farmer's have been mitigating to disaster due to adverse effect of climate change. The present study was conducted in plain zone of Chhattisgarh state in the year 2013-14. For the purpose, 240 farmers of Chhattisgarh plain were interviewed. Based on the results of the interviews most of the farmers (about 90%) mentioned that they faced drought and erratic rainfall as disaster during previous 15 years. Majority of the affected farmers (about 50%) reported that their income and yield reduced due to flooding or heavy rainfall. In case of erratic rainfall, drought and frost same losses had reported by most of the affected farmers. About 61.57, 23.78, 14.42 and 8.04 per cent of affected farmers said that they had lost their livestock due to drought, environmental pollution, erratic rainfall and flood, respectively. As regards to copping mechanism practiced by farmers to mitigate losses from disaster, majority of the farmers borrowed loan to mitigate adverse effect of frost (79.14%), erratic rainfall (72.09%), drought (60.19%) and flood (38.19%).However, poor and marginalized groups were unaware regarding climate change impacts and adaptation measures. Thus, these measures were found to be event specific based on local knowledge and innovations, and not actually to cope with the impacts of climate change.

Keywords : Climate, Disaster, Farmers, Chhattisgarh

INTRODUCTION

Climate change and agriculture are interrelated processes, both of which take place on a global scale (Parry *et al.*, 2007). Global warming is projected to have significant impacts on conditions affecting agriculture, including temperature, precipitation and glacial run-off (Funk *et al.*, 2008 and McCarthy *et al*., 2001). Agriculture places heavy burden on the environment in the process of providing humanity with food and fiber, while climate is the primary determinant of agricultural productivity. Given the fundamental role of agriculture in human welfare, concern has been expressed by federal agencies and others regarding the potential effects of climate change on agricultural productivity. Interest in this issue has motivated a substantial body of research on climate change and agriculture over the past decade (Lobell *et al.*, 2008, Wolfe *et al.*, 2005 and Fischer *et al.*, 2002).

Like most other developing countries, people in India are dependent to a large extent on its natural resources for livelihood and economy. Any adverse impacts on these natural resources will have repercussion on the nation's livelihood security and economy and widen the gap between the rich and the poor. Climate change is predicted by scientists to have the main impact on agriculture, economy and livelihood of the populations of developing countries and India is one of them, where large parts of the population depend on climate sensitive sectors like agriculture and forestry for livelihood.

Several studies have indicated that India is particularly vulnerable to climate change due to dependency of its most of the agriculture on monsoon rainfall. Farmers of Chhattisgarh have been also facing disasters due to adverse effect of climate change. As the understanding on global climate and its change is pre requisite to take appropriate initiatives to combat climate change. The only solution for these huge populations seems to be adequate and relevant mitigation strategies.

METHODOLOGY

The present study was carried out in Plains of Chhattisgarh state during the year 2013-14 and 2014-15. Chhattisgarh state is divided in to 27 districts and 3 agro climatic zones namely Bastar Plateau, Chhattisgarh Plains and Northern Hills in which Four Districts of Chhattisgarh Plains were selected for present study. The study was carried out in 4 randomly selected districts of Chhattisgarh Plains. Two Blocks from each selected District were selected for the selection of villages. In this way 8 Blocks (Total 4 X 2 = 8) were selected randomly. From each selected blocks, 3 villages (Total 3 X 8 = 24) were selected randomly for the selection of respondents. From each selected village, 10 farmers were selected randomly, who had more than 15 years of farming experience.

The primary data were collected through personal interview with the help of pre-tested structured interview schedule. In addition to personal interview, group discussions were conducted in each selected village to affirm the response in group about disasters and its losses faced and by them during previous 15 years. Collected data were tabulated and

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processed by using appropriate statistical tools and presented in terms of frequency and percentage.

RESULT AND DISCUSSION

Disasters faced by respondents during previous 15 years

Agriculture is the mainstay in the study area, which is vulnerable at present because most of the farmers are dependent on monsoon for their agriculture. Any abnormality in monsoon may caused disasters and incurred heavy losses in agriculture productions. Table 1 shows the disasters faced by farmers during previous 15 years. About 90 per cent of the farmers faced drought and erratic rainfall as disaster during previous 15 years. Whereas, flooding and environmental pollution as disaster faced by 82.92 and 59.58 per cent of the farmers during previous 15 years, respectively. Similar findings were also reported by Pashupalak (2009).

Type of damages/losses incurred due to disaster

Regarding damages/losses face by the farmers due disaster is given in Table 1, which shows, majority of the affected farmers (about 50%) reported that their income and yield reduced due to flooding or heavy rainfall. In case of erratic rainfall, drought and frost same losses had reported by most of the affected farmers. About 61.57, 23.78, 14.42 and 8.04 per cent of affected farmers said that they had lost their livestock due to drought, environmental pollution, erratic rainfall and flood, respectively. Loss of business was reported by few numbers of respondents in case of drought (21.30%), flood (14.07%), erratic rainfall (4.18%) and frost (2.67%).

Copping mechanism to mitigate losses from disaster

As regards to copping mechanism practiced by farmers to mitigate losses from disaster is presented in Table 2. It shows that majority of the farmers borrowed loan to mitigate adverse effect of frost (79.14%), erratic rainfall (72.09%), drought (60.19%) and flood (38.19%). Second best copping mechanism was using saving as reported by 60.84, 58.60, 42.25, 24.12 and 22.22 per cent of the affected farmers in case of environmental pollution, erratic rainfall, frost, flood and drought, respectively.

Table 1. Distribution of respondents according to disaster and losses faced by them during previous 15 years

Type of disaster	Respondents who faced disaster		Type of damage/loss	Respondents who faced losses	
	F	P		F	P
Flooding /Heavy rainfall	199	82.92	Loss of business/service	28	14.07
			Income reduced	107	53.77
			Family members harmed	7	3.518
			House damaged	37	18.59
			Yield reduced	98	49.25
			Livestock loss	16	8.04
Erratic rainfall	215	89.58	Loss of business/service	9	4.186
			Income reduced	212	98.6
			House damaged	50	23.26
			Yield reduced	212	98.6
			Livestock loss	31	14.42
Drought	216	90	Loss of business/service	46	21.3
			Income reduced	215	99.54
			Family members harmed	17	7.87
			Loss to irrigation/drinking water sources	28	12.96
			Yield reduced	212	98.15
			Livestock loss	133	61.57
Frost	187	77.92	Loss of business/service	5	2.67
			Income reduced	164	87.70
			Family members harmed	37	19.79
			House damaged	143	76.47
			Yield reduced	170	90.91

Environmental pollution	143	59.58	Income reduced	124	86.71
			Health problems	51	35.66
			House damaged	18	12.59
			Yield reduced	140	97.90
			Livestock loss	34	23.78
			Contamination of water	43	30.06

Table 2. Distribution of respondents according to their copping mechanism to mitigate losses from disaster

Type of disaster	**Copping mechanism to mitigate losses from disaster**	**Respondents**	
		F	**P**
Flooding	Use savings	48	24.12
	Selling of property	34	17.09
	Borrowing loan	76	38.19
	Reduce consumption	31	15.58
	Government and relief and aid	44	22.11
	Migration	22	11.06
Erratic rainfall	Use savings	126	58.60
	Selling of property	39	18.14
	Borrowing loan	155	72.09
	Reduce consumption	31	14.42
	Government and relief and aid	8	3.72
	Migration	7	3.26
Drought	Use savings	48	22.22
	Land lease/mortgage	14	6.48
	Selling of property	102	47.22
	Borrowing loan	130	60.19
	Reduce consumption	101	46.76
	Government and relief and aid	111	51.39
	Migration	92	42.59
Frost	Use savings	79	42.25
	Selling of property	49	26.20
	Borrowing loan	148	79.14
	Government and relief and aid	150	80.21
	Migration	7	3.74
Environmental pollution	Use savings	87	60.84
	Land lease/mortgage	11	7.69
	Selling of land	72	50.35
	Filtering of drinking water	29	20.27
	More plantation	38	26.57
	Getting medical treatment	31	21.67

CONCLUSION

As per the above discussions it can be concluded that empowering communities with information, technological skills, education and employment is the best way to combat against disaster. A location wise action-research is therefore necessary to identify and document climate change impacts and copping strategy. The local observations described above provide a clear direction for future research and for development planning and copping management programs in different ecological regions. Policy and

program should be formulating holistic approach to mitigate adverse impact of climate change on agriculture and improve livelihood of the local communities.

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