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A Study on the Constraints Faced by the Rice Growers w hile Adopting the Climate Based Adaptation Strategy

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The study aimed to assess the constraints faced by the rice growers in taking adaptation strategy towards ensuring livelihood and food security and to enlist suitable suggestions to overcome these problems. The study was conducted in Orathanadu block of Thanjavur district in Tamil Nadu and proportionate random sampling was employed to select 120 sample respondents from the four selected villages from the above block. Majority of the farmers felt high cost of farm input (96.70 %), non-availability of water storage facility (95.00 %), taking more time to get crop loan (97.50 %), non availability of farm labour (98.30 %), lack of access to weather forecasting technologies (62.50 %), as their major constraints in taking up the adaptation strategies towards climate change in ensuring livelihood and food security.

Key words: Climate change**,** Constraints, Adaptation strategy.

Climate change is any significant long-term change in the expected patterns of average weather of region (or the whole of Earth) over a significant period of time that may have influence on adequate stock and flow of food and cash to meet the basic needs (livelihood), the ability of the individuals to have all time physical and economical access to sufficient and safe food for a healthy life (food security). In the last decades, it has become increasingly apparent that climate change is already happening and will continue to happen, bringing its non local impacts on people's livelihoods (Parry *et al.,* 2007).

One of society's key sensitivities to climate change is food. Rising temperatures and changes in rainfall patterns affect agricultural yields of both rain-fed and irrigated crops (Gommes *et al.,* 2009; Edward *et al.,* 2014). A lengthy period of insufficient or excessive rainfall, a sudden hot spell or cold snap, climatic extremes such as flooding or storms, can have a significant impact on the local crop yields and livestock production. Agriculture is adversely affected by climate change. To sustain their livelihood in this changing climate, farmers are taking up many alternative measures to manage these ill effects.

Adaptation refers to the changes made in the agricultural practices to counteract the impact of changes in temperature and precipitation. Constraint analysis is becoming one of the important components of extension research. Without analyzing the constraints, it is impossible to diffuse the technologies among the farming community. Hence, the present study was conducted to identify the constraints faced by the farmers in taking up the adaptive measures in terms of information on climate change, farm input utilization, irrigation and water management, credit and labour related constraints to ensure their livelihood.

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Material and Methods

As it is the rice bowl of Tamil Nadu, Thanjavur district was considered for this study. The study area was selected purposively. Among 14 agricultural blocks in Thanjavur district Orathanadu was selected as it is reflected with the highest area of rice cultivation and more number of rice farmers. Again considering the same criteria the villages, Thirumangalakkottai (East), Poyyundarkottai, Vadakkurnorth, Vellur from Orathanadu block were selected for this study. Proportionate random sampling method was used to select the respondents from the selected four villages. It was decided to select two percentage of the total population as the sample. Accordingly, the sample size was fixed as 120 respondents. Fifteen independent variables were selected to study the profile of the farmers. By employing the open ended questionnaire, the constraints faced by them in adopting the adaptation strategy related to the climate change to ensure livelihood and food security were recorded and categorized as given in Table 1. Percentage analysis was done to get meaningful interpretation of the results.

Results and Discussion

Constraints faced by the respondents while adopting the recommended adaptation strategies

The constraints faced by the rice growers in the study area is innumerable among which the labour cost, high cost of farm inputs and consumption of more time in availing bank loan were the constraints faced by majority of the respondents. Sangeetha (2013) also found that the majority of the farmers in the study area are facing constraints due to labour

cost and high cost of farm inputs. The constraints faced by the farmers in the study area were collected, analyzed and presented in the Table 1.

Table 1. Distribution of respondents according to their constraints while adopting the climate based adaptation measures

Constraints	No*	Per cent
A) Difficulties in Accessing Information on climate change		
Lack of access to weather forecasting technologies	75	62.50
Poor information on early warning systems	64	53.30
Poor agricultural extension service delivery	45	37.50
B) Farm input utilization		
High cost of farm inputs	116	96.70
Non availability of timely farm inputs	4	3.30
Lack of information for input management	66	55.00
C) Irrigation and water management		
Scarcity of water	112	93.30
Non-availability of water storage facilities	114	95.00
High cost-efficient irrigation systems	109	90.80
D) Credit and economic factors		
High Cost mitigation strategies	103	85.80
More time consumption to avail crop loans from the banks	117	97.50
Low price of produce in the market	102	85.00
Delay in settlement of crop insurance claim	85	70.83
E) Labour constraints		
Non-availability of farm labours	112	93.30
High cost labour	118	98.30

(* Multiple response)

Difficulty in the access of information on climate change

It could be found from Table 1. that majority (62.50 %) of the farmers felt lack of access to weather forecasting technologies as a major constraints followed by poor information on early warning systems (53.30 %) and poor agricultural extension service delivery (37.50 %). The information on climate change is disseminated through use of ICT tools. Farmers do not have appropriate skills in accessing such information. So they couldn't take up the mechanism to change over to recommended technologies. The information gap between scientist and the farmers was found to be more and the gap is to be eliminated by the proper use of ICT tools and training the farmers to access such tools.

Farm input utilization

It is evident from the Table 1, that high cost of farm input was the major constraints felt by a majority (96.70 %) of the farmers followed by lack of information for input management (55.00 %) and non availability of timely farm inputs (3.30 %). High cost of inputs such as high yielding variety seeds, herbicides, fertilizers, bio-fertilizers, and pesticides was felt as a major constraint and hence, the farmers could not afford to buy these inputs. It has been considered as an important threat to the adoption of the coping mechanism.

Irrigation and water management

It could be concluded from Table 1, that an over whelming majority (95.00 %) of the respondents in the study area found non-availability of water storage facility as the major constraint followed by scarcity of water (93.30 %) and cost-efficient irrigation system (90.80 %). Most of the farmers felt that there was insufficient rainfall and irregularity in release of water from the Stanley reservoir. This made the farmers difficult to adapt to the recommended alternate technologies to mitigate the effect of climate change.

Credit constraints

It could be seen from the Table 1, that taking more time to get crop loan (97.50 %) was the major constraints followed by high cost mitigation strategies (85.80 %), low price for the produce in the market (85.00 %) and delay in the settlement of crop insurance claim (70.83 %) were the major constraints faced. Climate change mitigating measures involve huge cost as perceived by majority of them. Further, getting loans for crop needs involve a series of systematic and hectic processes which would consume considerable amount of time of the farmers.

Table 2. Distribution of respondents according to their suggestions to overcome the constraints

Suggestions	No.*	Per cent
Improved information delivery of weather based advisories to be developed	90	75.00
Farm inputs and machineries can be provided on subsidized cost	95	79.10
Training on new adaptation strategies	98	81.60
Less water use technologies can be developed and disseminated	102	85.00
Effective technologies can be developed to manage the climate induced pest and disease	100	83.33
MGNREGA scheme has to be modified to solve labour problem	120	100.00
Ensure the timely credit services to the farmers	110	91.16
Development of promising marketing opportunities for the produce	118	98.33
Government extension system should be improved to provide services to the farmers	80	66.66

(* Multiple response)

Labour constraints

It is evident from the Table 1, that non availability of farm labour was the major constraints faced by an overwhelming majority (98.30 %) of the farmers in the study area followed by high cost of labours (93.30 %). The reason for non-availability of farm labour and high cost may be due to the migration of the rural people to urban areas for want of remunerative income. Majority of the nonfarm holders were engaged in wage earning under MGNREGA. This may also be the reason for non-availability of labour and high cost labour.

Other constraints

The farmers of the study area had felt that the opening of the Direct Procurement Center (DPC) was not coinciding with the time of harvest of the farmers. Further, DPC procures paddy from the farmers by checking moisture level and demands the farmers

to go for winnowing their produce before bringing it to the DPC. As the farmers in the Orathanadu block don't have the facilities to dry and winnow their produce, it would always be difficult for them to fulfill the standards required by the DPC. Moreover fulfilling the standards given by DPC would further increase the cost of cultivation.

Suggestions to overcome the encountered constraints

All the farmers suggested MGNREGA scheme has to be modified to solve labour problem (100 %) followed by the development of promising marketing opportunities for the produce (98.33 %), ensure the timely credit services to the farmers (91.16 %), development of less water use technologies, provision of machineries at a subsidized cost (79.10 %), improved information delivery on weather based advisories to be developed (75.00 %) and government extension system should be improved to provide services to farmers (66.66 %).

The farmers also suggested to develop a common facility in every village, where the farmers could dry and winnow their produce at nominal costs. The local extension functionaries should consider this option.

Conclusion

The constraints identified in the study have to be considered by the local extension functionaries so as to solve climate induced challenges on crop production. Here providing timely information on climate change, providing subsidized low cost inputs and developing better water storage facilities are to be given prime importance. By helping the farmers to overcome the constraints, the impact faced by them due to climate change can be reduced and their livelihood standard can be increased.

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