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Constraints in Adapting the Climate Change in Konkan Region of Maharashtra

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ABSTRACT

Changing climate is a serious environmental issue affecting agricultural production all over the world. India is also facing the problem of increased mean temperature and irregularity of rainfall, and the Konkan region of Maharashtra is also not escaped from this issue. The study was designed and conducted in the northern part of the Konkan region to understand the constraints experienced by the farmers while adapting the climate change. The study was carried in four villages of Palghar district with 245 respondents selected by proportionate random sampling method. Major constraints were expressed by the farmers while adapting the changing climate were, lack of credence on current weather forecasting system, poor accurate weather forecast information, irregular & low voltage capacity power supply and seven others.

INTRODUCTION

Agriculture and climate are strongly co-dependent on each other. Changing pattern of the climate is adversely affecting the rate of farm production. Climatic factors like precipitation and temperature plays deciding role in crop yields. Even though changed temperature and precipitation will have slight number of advantages for some regions, agricultural experts agrees that average change in the climatic pattern will result in overall reduction in agricultural production on global level (Kucharik & Serbin, 2008; CCSP, 2008). Most of the Indian farming population still belongs to non-urban part of the country and most of them are possessing small and marginal land holding. Also large number of the working population depends on agriculture for their livelihood support. The agriculture sector particularly, in rainfed area depend on monsoon are likely to observe the adverse impacts of climate change. While, major impacts of climate change will be on rainfed crops, which is cultivated in nearly 60 per cent of area in India. (Dupdal et al., 2021). In past years it has been predicted that, with the rise in temperature by 2.5°C to 4.9°C the yield of rice and wheat will drop by 32 to 40 per cent and 41 to 52 per cent, respectively (Chouksey et al., 2021). Maharashtra is the third largest State in India and the most vulnerable to climate change and faces extreme climatic events and stressors such as floods, cyclones, droughts, changing rainfall patterns and extreme temperatures (Adhav et al., 2021). The narrow coastal belt along the western margin of the state is known as Konkan (Sanskrit word "*Kona*" = corner and "*Kana*" = piece) and is located between the Sahyadri ranges in the east, and Arabian Sea in the west. Konkan region has much variation in rainfall as well as in temperature and faces many climatic as well as geographical challenges.

Adaptation strategies are important to cope with extreme weather. It is the process of adjustments or moderation in natural or human systems in response to actual or expected climate change as well as taking advantage of beneficial opportunities (IPCC, 2001). Constraints hampers the potential to find out, to approach and to handle the risk that decreases the adverse effect related to climatic event and also affects the development and application of adaptation into use. Farmers are facing number of constraints while adapting to the changing climate. With the help of proper planning, suitable strategies and efficient utilization of available resources it is possible to overcome the constraints. Therefore, to understand the constraints experienced by the farmers while adapting the change in the climate, become important that too for the adversely affected regions.

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METHODOLOGY

The study was conducted in the Palghar district which is the northern part of the Konkan region of Maharashtra state. The study was conducted in two randomly selected Taluka. For the selection of the respondents, proportionate random sampling method was employed through which a total of 245 respondents from four villages (two from each selected Taluka) was finalized. Primary data was conducted using structured interview schedule. With the help of Henry Garrett's Ranking Technique, rankings given by respondents was evaluated. Respondents were asked to assign the rank to the listed constraints and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Percent position} = \frac{100\ (Rij - 0.5)}{Nj}$$

Where, Rij = Rank given for the ith variable by jth respondents, Nj = Number of variable ranked by jth respondents

With the help of Garrett's Table, the percent position estimated was converted into scores. Then for each constraint factor, the scores of each individual were added and then total value of scores and mean values of score was calculated. The constraint factor having highest mean value was considered to be the most important factor.

RESULTS AND DISCUSSION

Table 1 portrayed that while adapting the changing climate 72.25 per cent of the respondents were having lack of trust on current weather forecasting system as the existing forecast system provides poor information about weather forecast said by 71.30 per cent of the respondents. Current weather forecasting systems were deficient in specific level which do not support farmers in adaptation. Despite the fact that weather forecasting systems keep changing their forecast rapidly, the agriculturists are still depending on them, yet recasting in advisories finds challenging to adapt such changes for agriculturists.

Availability of the practical information and support about changing climate plays vital role in adaptation of climate change (Semenza et al., 2011; Pandve et al., 2011). It was noticed that, 68.70 percent of the respondents reported lack of support from government agencies with respect to climate change and 56.43 % of the respondents confirmed limited access to agricultural extension services. Figures indicate that the role played by the government extension agencies was insufficient to support the farmers with regards to adaptation of changing climate. The efficient and timeous execution of farm inputs like; use of quality seeds, planting material, suitable varieties, integrated pest management practices, healthy soil and water management practices are important for the sustainable crop production which also contributes to adaptation of climate change (FAO, 2013). It was found that, 55.95 per cent of the respondents experienced unavailability of the inputs on time as their major constraint while adapting the changing climate which shows there is a need to address these challenges to strengthen the farmers' capability. For the appropriate adaptation having the updated knowledge is seen as important factor among the farmer (Castilla et al., 2013; Liang et al., 2014; Ghanghas et al., 2015; Ravikumar et al., 2015). Akpan et al., (2012) in their study on analysis of the influence of the Nigerian mass media on public understanding of climate change, argued that 'public action towards climate change will not begin until the public understands climate change and their place in the fight against it, especially in the area of forcing the authorities to make and execute meaningful policy about it.' It was noticed that 48.34 per cent of the respondents pointed out that farmers were having inadequate knowledge about appropriate climate change coping strategies. Further 39.73 per cent of the respondents expressed that they were experiencing unsteady communication facilities at their place which becomes the hurdle to access different communication as well as media sources. Study further revealed that, 30.57 per cent of the respondents said that they were lacking with savings which would help them in emergency while adapting the sudden change in the climate and aftermost 28.75 per cent of the respondents reported irregular and low voltage supply of the electricity as their major constraint which act as obstacle in accessing different electricity dependent farm operations.

CONCLUSION

The farmers faced multiple constraints and challenges to adapt to changing climatic pattern as they are at vulnerable situation. Farmers needed more reliable weather forecast system upon which they can trust to carry out their farming operations timely. Extreme climatic events affecting the agriculture sector requires that the farmers be provided with updated information on climate change as this will help farmers in improving their awareness and adaptive capability with respect to climate change. There is need to improve extension connectivity and to provide assistance with respect to climate change among the farmers. In addition to that farmers also needed timely supply of inputs and stable communication facilities. It is essential to promote awareness and importance of saving habits among the farmers.

Table 1. Constraints experienced by the respondents

S.No.	Constraints	Average	Rank
1	Lack of credence on current weather forecasting system	72.25	I
2	Inadequate knowledge about appropriate climate change coping strategies	48.34	VI
3	Poor accurate weather forecast information	71.30	II
4	Lack of support from government agencies with respect to climate change	68.70	III
5	Unavailability of inputs on time	55.95	V
6	Limited access to agricultural extension services	56.43	IV
7	Irregular & low voltage capacity power supply	28.75	IX
8	Unsteady communication facilities	39.73	VII
9	Short of savings	30.57	VIII

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