

International Journal of Agriculture Extension and Social Development

Volume 7; SP-Issue 2; Jan 2024; Page No. 15-17

Received: 02-12-2023
Accepted: 03-01-2024

Indexed Journal
Peer Reviewed Journal

Constraints faced and suggestions elicited by the dairy farmers' to mitigate the adverse effect of climate change

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DOI: <https://doi.org/10.33545/26180723.2024.v7.i2Sa.292>

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Abstract

Climate change related hazards and disasters have a negative impact on dairy animals both directly and indirectly. To mitigate the negative impact on dairy animals, adaptation is the most suitable way. But despite of having knowledge about the mitigation strategies the farmers are unable to adopt these strategies as they are constrained by many factors. With this view the present study was carried out on 240 dairy farmers belonging to all the three agro-climatic regions of Jharkhand to know the constraints faced and suggestions elicited by them in mitigating the adverse effect of climate change.

The findings of the present study revealed that the dairy farmers ranked institutional constraints as 1st and severe most constraint followed by personal, communicational and technical constraints as 2nd, 3rd and 4th, respectively. Most of the respondents expressed low literacy level, inadequate knowledge, lack of technical guidance and technical know-how, difficulties in shifting of livestock rearing pattern, poor extension services on climate risk, and lack of institutional credit, government policy and training program as the more severe constraints.

Among various suggestions to mitigate the adverse effect of climate change, the dairy farmers ranked 1st to facilitating the various training programs for acquiring the knowledge about climate change followed by arranging capacity building programs to strengthen the farmers as 2nd, improving access to institutional credit as 3rd, Extending cattle insurance facility as 4th, improving knowledge level of farmers through various communication networks as 5th, creating awareness in the farmers about appropriate adaptation measures against climate change as 6th, administering strict Govt. Policy to maintain ecological balance as 7th, timely information about weather forecasting as 8th and improving information access on climate risk management as 9th.

From the findings of the study it can be inferred that these constraints are needed to be suitably resolved by the government to make the dairy farming a sustainable and profitable enterprise. Suggestions offered by the respondents to mitigate the adverse effect of climate change must be considered seriously to include in the development programs to reduce the vulnerability due to climatic variability.

Keywords: Constraints, adoption, mitigation strategies, suggestions, dairy farmers, climate change

Introduction

The entire world is experiencing climate change and its effect on ecological system. The evidence from the Intergovernmental Panel on Climate Change (IPCC, 2007) ^[1] has clearly indicated that climate change is real. The article by Pasqui and Di Giuseppe (2019) ^[2] also mentioned that climate is changing. It is most commonly manifested by

an increase in average global temperature, weather-related disasters and extreme weather events. The changing climate has now become a major threat to all living organisms and the sustainability of biodiversity. Climate change related hazards and disasters have a negative impact on animals both directly and indirectly. The direct impacts include reduced production and productivity of animals and

increased morbidity and mortality whereas indirect impacts include shortage/non-availability of green fodder, natural water, round the year availability of feed and fodder, increased incidence of vector borne diseases, etc.

Like any other species, dairy animals are also threatened by the changing climate. To mitigate the negative impact on dairy animals, adaptation is the most suitable way. Many studies indicated dairy farmers having more or less knowledge about the mitigation strategies but during adoption of these strategies they are constrained by many factors (Mysaa *et al.*, 2021 and Hassen *et al.*, 2022) [3, 4]. With this view an attempt was made to know the constraints faced and suggestions elicited by the dairy farmers' in mitigating the adverse effect of climate change in Jharkhand.

Materials and Methods

The present study was conducted in six districts namely Ranchi, Jharkhand, East Singhbhum, Seraikela Kharsawan, Latehar and Khunti belonging to three agro-climatic regions

viz. Central North-eastern plateau, Western plateau and South-eastern plateau of Jharkhand. From each district, two blocks and four villages were selected randomly. From each village, ten dairy farmers having at least two dairy animals with farming experience of minimum 10 years were selected purposively. Thus, a total of 240 dairy farmers were interviewed for the present study. The data was collected through pre-structured interview schedule. The responses were recorded individually. Further Garrett's ranking technique was used to know the overall ranking.

Results and Discussions

1. Constraints faced by the farmers in adapting the mitigation strategies

The data after Garrett's analysis is presented in Table 1 which reveals that the dairy farmers ranked institutional constraints as 1st and severe most constraint followed by personal, communicational and technical constraints as 2nd, 3rd and 4th, respectively.

Table 1: Constraints faced by the farmers in adapting the mitigation strategies

Particulars	% Position	Average Score	Rank
Personal constraints Low literacy level Small herd size Inadequate knowledge Paucity of money	12.5	45.60	2 nd
Technical constraints Lack of technical guidance Non-availability of climate resilient breeds Lack of access to weather forecasting technology Difficulties in shifting of livestock rearing pattern Lack of technical know-how	37.5	43.55	4 th
Communicational constraints Poor extension services on climate risk Poor access to information sources	62.5	44.21	3 rd
Institutional constraints Lack of institutional credit Lack of Govt. Policy Lack of training programme	87.5	68.45	1 st

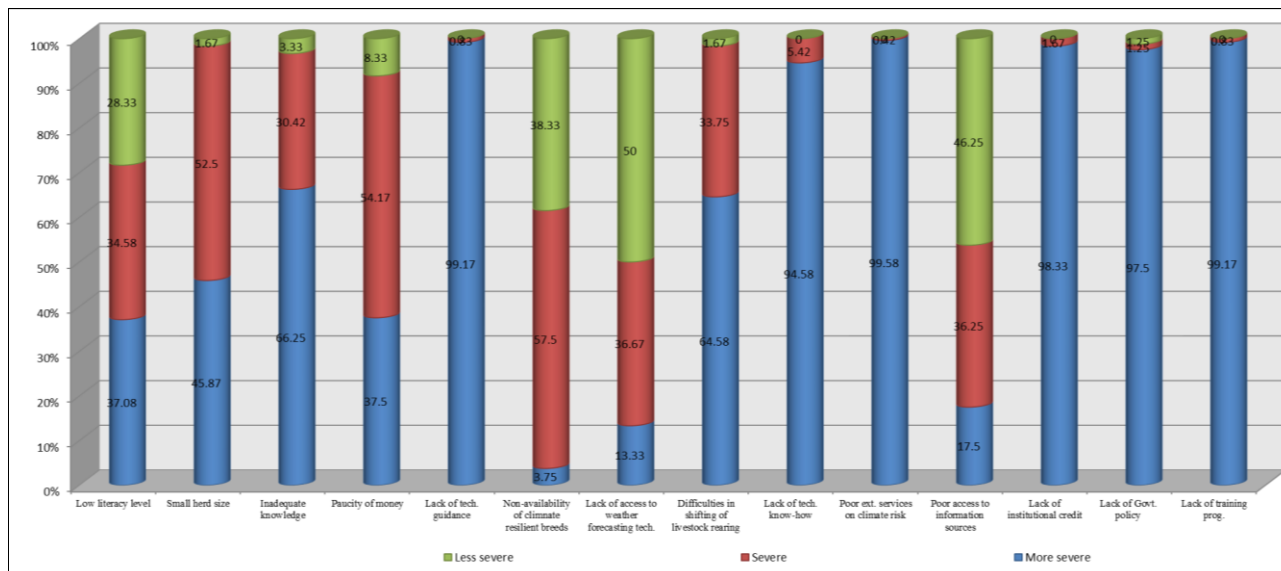


Fig 1: Distribution of respondents according to the constraints faced in adapting the mitigation strategies

Further on detail analysis (Fig. 1) it was found that most of the farmers expressed low literacy level (37.08%), inadequate knowledge (66.25%), lack of technical guidance (99.17%) and technical know-how (94.58%), difficulties in shifting of livestock rearing pattern (64.58%), poor extension services on climate risk (99.58%), and lack of institutional credit (98.33%), government policy (97.50%) and training programme (99.17%) as the more severe constraints. Most of them expressed small herd size (52.50%), paucity of money (54.17%) and non-availability of climate resilient breeds (57.50%) as severe constraints whereas lack of access to weather forecasting technology

(50%) and poor access to information sources (46.25%) were expressed as less severe constraints. The findings are in line with Sarkar *et al.* (2010)^[5] and Sesay and Kallon (2022)^[6].

2. Suggestions elicited by the respondents to mitigate the adverse effect of climate

Every farmer has their own opinion about the preference of the ways through which the adverse effect of climate change can be mitigated. Therefore, the farmers were asked to rank possible suggestions.

Table 2: Suggestions elicited by the farmers to mitigate the adverse effect of climate change

Sl. No.	Suggestions	% Position	Average Score	Rank
1	Timely information about weather forecasting	5.55	38.40	8 th
2	Improving information access on climate risk management	16.67	36.24	9 th
3	Improving access to institutional credit	27.78	56.91	3 rd
4	Extending cattle insurance facility	38.89	55.98	4 th
5	Arranging capacity building programmes to strengthen the farmers	50	61.54	2 nd
6	Improving knowledge level of farmers through various communication networks	61.11	55.61	5 th
7	Facilitating the various training programmes for acquiring the knowledge about climate change to farmers	72.22	64.09	1 st
8	Creating awareness in the farmers about appropriate adaptation measures against climate change	83.33	52.01	6 th
9	Administering strict Govt. Policy to maintain ecological balance	94.44	40.81	7 th

As per the table above among various suggestions, facilitating the various training programs for acquiring the knowledge about climate change to farmers was ranked 1st, arranging capacity building programs to strengthen the farmers as 2nd, improving access to institutional credit as 3rd, Extending cattle insurance facility as 4th, improving knowledge level of farmers through various communication networks as 5th, creating awareness in the farmers about appropriate adaptation measures against climate change as 6th, administering strict Govt. Policy to maintain ecological balance as 7th, timely information about weather forecasting as 8th and improving information access on climate risk management as 9th the last one. Similarly organization of awareness campaign about climatic problems was suggested by Kant *et al.* (2015)^[7].

Conclusion

Adaptation is the best way to mitigate the adverse effect of climate change, but in practice our dairy farmers face many problems in adopting the mitigation strategies. In the present study institutional constraints were ranked first followed by personal, communicational and technical constraints, respectively in adapting the mitigation strategies. Most of the farmers suggested facilitating the various training programs to increase their knowledge about climate change and arranging capacity building programs to strengthen them as their first priority.

Therefore these constraints are needed to be suitably resolved by the government to make the dairy farming a sustainable and profitable enterprise. Suggestions offered by the respondents to mitigate the adverse effect of climate change must be considered seriously to include in the development programmes to reduce the vulnerability due to climatic variability.

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