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An Assessment of Vulnerability and Trade-offs of Dairy Farmers of India to Climate Variability and Change

Aparna Radhakrishnan, Jancy Gupta, and Dileepkumar Ravindran
India (aparnaradhak@gmail.com)

The study aims at assessing the vulnerability and tradeoffs of dairy based livelihoods to Climate Variability and Change (CVC) in the Western Ghats ecosystem, India. For this purpose; data were aggregated to an overall Livelihood Vulnerability Index (LVI) to CVC underlying the principles of IPCC, using 40 indicators under 7 LVI components. Fussel framework was used for the nomenclature of vulnerable situation and trade-off between vulnerability components and milk production was calculated. Data were collected through participatory rural appraisal and personal interviews from 360 randomly selected dairy farmers of nine blocks from three states of Western Ghat region, complemented by thirty years of gridded weather data and livestock data. The LVI score of dairy based livelihoods of six taluks were negative. The data were normalized and then combined into three indices of sensitivity, exposure and adaptive capacity, which were then averaged with weights given using principal component analysis, to obtain the overall vulnerability index. Mann Whitney U test was used to find the significant difference between the taluks in terms of LVI and cumulative square root frequency method was used to categorise the farmers. Even though the taluks are geographically closer, there is significant difference in the LVI values of the regions. Results indicated that the Lanja taluks of Maharashtra is the most vulnerable having an overall LVI value -4.17 with 48% farmers falling in highly vulnerable category. Panel regression analysis reveals that there is significant synergy between average milk production and livestock, social network component and trade-off between natural disasters climate variability component of LVI. Policies for incentivizing the ‘climate risk adaptation’ costs for small and marginal farmers and livelihood infrastructure for mitigating risks and promoting grass root level innovations are necessary to sustain dairy farming of the region. Thus the research will provide an important basis for policy makers to develop appropriate adaptation strategies for alarming situation and decision making for farmers to minimize the risk of dairy sector to climate variability.