Keynote Speech

Considerations in risk assessment and vulnerability- adaptation studies for climate smart livestock farming

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Abstract

Animal and human welfare are interlinked with each other and to climate change as well. The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability to climate change as "the degree to which a system is susceptible, or unable to cope with adverse effect of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity." Exposure is the nature and degree to which a system is exposed to significant climatic variations. Sensitivity is the degree to which a system is affected, either adversely or beneficially by climate-related stimuli. Adaptive capacity is the ability of a system to adjust to climate change including climate variability and extremes, to moderate the potential damage from it, to take advantage of its opportunities, or to cope with its consequences (IPCC 2001). Vulnerability indices for large communities, crop agriculture, businesses/industries, and regions/counties have been prepared and are commonly used by developmental agencies in quantifying climate change vulnerability and prioritizing fund allocation. Besides climatic variables, such as livestock sector has special consideration for experimental data like feed and fodder compositions and availability, soil nutrients, animals' blood biochemistry, prevalence diseases, incidence of metabolic diseases like mastitis, reproductive performance of animals etc. The commonly available vulnerability models have no provision for including this type of data. Therefore, there is need for exploring the possibility of quantifying vulnerabilities and adaptive capacity in livestock production systems, factors (called indicators and sub-indicators; reported and available from reliable sources). There are very few models for mathematical representation of vulnerability in animal production systems. These indices can be used for mathematical quantification of vulnerability which can help in prioritizing fund allocation for climate change adaptation and mitigation strategies.

Key words: Adaptation, Climate change Livestock, Vulnerability

Introduction

Two distinct notions of vulnerability are – bio-physical vulnerability and social vulnerability. Bio-physical vulnerability is concerned with the ultimate impacts of a hazard event and is often viewed in terms of the amount of damage experienced by a system as a result of an encounter with a hazard. Social vulnerability, on the other hand, is viewed more as a potential state of human societies that can affect the way they experience natural hazards. In most studies' vulnerability has been assessed at regional or national level. The vulnerability of crop farmers as well as fisherman have been widely assessed, but livestock-based farming has remained mostly unassessed for vulnerability.

The identification of indicators and sub-indicators is a key step in assessing livestock rearers' vulnerability to climate change. Table 1 enumerates some of the identified indicators and sub indicators used by the researchers at the Central Institute for Research on buffaloes, Hisar, India for assessing vulnerability in buffalo production systems.