

Chapter 7

Vulnerability to Local Climate Change: Farmers' Perceptions on Trends in Western Odisha, India¹

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ABSTRACT

The paper analyses the perceptions of the farmers on various aspects of present as well as future vulnerability to local climate change in western Odisha, India. The changes in various climatic factors like rainfall, temperature, drought frequency and intensity during last three decades have been assessed. The farmers' experiences on hardships faced, natural and human induced causes of the changes observed have been examined. The perceptions on changes/trend in various vulnerability factors such as water availability, soil quality, early warning system, deforestation, social safety nets, institutional support system, degradation of wild life habitat, loss of wetland and water bodies, and damage to plant species etc. have been scrutinized. Besides, the future vulnerability to climate change has been assessed by ranking the vulnerability factors (economic/environmental/social/institutional) with respect to their effects during past, present and future climatic risks in the matrix form, thereby identifying the vulnerability factors posing greater threat in future. The study is based on the survey of 139 households. The study finds significant changes in behavior of climatic factors in western Odisha. The factors that are posing greater threat in future are increasing temperature and rainfall variability, frequent pest attack and plant diseases, gradual decline in grazing land and fodder availability, reduction and degradation of wild life habitat and loss of wetland and water bodies.

1. INTRODUCTION

Climate change is unequivocal, accelerating and beginning to affect vulnerable states. The complex process of climate change affects the vulnerable

populations, livelihoods and different sectors through increasing occurrence of climate induced natural disasters (CINDs) like drought, flood, cyclone, desertification, and global warming (IPCC 2001). The consequent situations are further ag-

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gravated by human actions or inactions. Among these CINDs, drought is considered by many to be the most complex but least understood affecting more people than any other hazard (Hagman 1984, IPCC, 2007). More than half of the world population is susceptible to drought every year (Kogan 1997). It is a slow onset creeping disaster which is gradually increasing in intensity and frequency both spatially and temporally. In the coming decades, the extent of drought risk and vulnerability is expected to increase irrespective of changes in drought exposure mainly due to development pressure, population increase, and environmental degradation (ISDR, 2002; Adger, 2006). As a result of growing vulnerability of people to underlying socio-economic and environmental changes induced by recurrent droughts, coping mechanism and long-term adaptation strategies are certain to change with major changes in livelihood options.

Keeping in view the changing circumstances, appropriate policy needs to be formulated for adapting to increasing vulnerability and a precautionary approach at different levels is essential. Rural people's perceptions on drought and climate change vulnerability form important tool for devising a rational mitigation strategy to reduce their vulnerability. The experiences and perceptions of farmers help in understanding the grass root level changes in local climate and their effects on agriculture, water and environment among others, which are free from any media and political biases.

In this context, this paper analyses the perceptions of the farmers on various aspects of present as well as future vulnerability to drought and climate change in Bolangir District of western Odisha. The changes in various climatic factors like rainfall, temperature, drought frequency and intensity during last three decades have been assessed. The farmers' experiences on hardships faced, natural and human induced causes of the changes observed have been examined. The perceptions on changes/trend in various vulnerability factors such as water availability,

soil quality, early warning system, deforestation, social safety nets, institutional support system, degradation of wild life habitat, loss of wetland and water bodies, and damage to plant species etc. have been scrutinized.

2. DATA AND METHODOLOGY

2.1. The Study Region

Bolangir district of western Orissa which is named after the headquarter town of Bolangir lies between 20° 11' 40" - 21° 05' 08" North Latitude and 82° 41' 15" - 83° 40' 22" East Longitude (Figure 1). The district is one of the constituent districts of the KBK (Kalahandi-Bolangir-Koraput) region of Orissa². The district is situated in the valley of rivers like *Ang* and *Tel* with important tributaries like *Lanth*, *Sonegarh* & *Suktel*. The district is flanked by the Gandhamardan hill range in the north-west, Bargarh district to the north, Sonepur to the east, Kalahandi to the south and Nuapada to the west (GOO, 2006). The geographical area of the district is 6,569 sq. km, and has a population of about 1.34 million (GOI, 2001). The district has three sub-divisions (Bolangir, Patnagarh and Titlagarh), 6 Tahasils, 14 community development blocks (CD blocks), 285 gram panchayats, 1792 villages and 6 rural assembly constituencies. The proportion of rural population is much higher (88.45%) in the district and so also in the entire KBK region. The proportion of scheduled castes (SCs) and scheduled tribe (STs) in total population was around

16.9 percent and 20.6 percent respectively. The population growth rate was about 16 percent during 1981-1991 which was declined to 8.5 percent during the period from 1991 to 2001, the lowest population growth in the state. Out of a total geographical area of 657 thousand hectares, about 47.8 per cent is net sown area and 23.4 per cent is covered under forests. Analyzing the soil characteristics of Bolangir (Pattnaik, 1998), it reveals

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