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Meteorological drought and coping strategies by small and marginal farmers in semi-arid Karnataka

Biswajit Mondal¹, N. Loganandhan² and A. Raizada³

¹Central Rice Research Institute, Cuttack- 753 006, Odisha; ²Krishi Vigyan Kendra, Hirehalli, Tumkur-572104, Karnataka;

³Central Soil and Water Conservation Research and Training Institute, Research Centre, Bellary-583104, Karnataka;

¹Email: bisumondal@rediffmail.com

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ABSTRACT

Occurrence of frequent droughts of varying intensities is a critical constraint in improving agricultural productivity in the dry tropics. This paper quantifies meteorological drought from long-term annual rainfall data. Analysis of primary survey data from two watersheds indicated that moisture stress and fodder shortage were the major shocks experienced by farmers during drought, which caused low productivity of crops and animals. Farmers had their own strategies to cope with the drought like diversifying farming practices, borrowing, migration, sale of assets and livestock. The logit regression model indicated that coping strategies were influenced by number of earning family members, availability of irrigation facility, animal holding and income from non-farm sources. There is an urgent need to implement drought mitigation measures by central and state government institutions through both short and long term strategies covering technological and policy interventions like alternate cropping systems that augment soil moisture conservation, emphasis on water harvesting and ground water recharge, ensuring fodder and seed supplies, credit assistance, etc.

1. INTRODUCTION

Drought is a recurring climatic event, fairly common in the arid and semi-arid region, although its features vary from region to region. Conceptually, a drought is considered to describe a situation of limited rainfall, substantially below the 'normal' value for the area concerned. The definition of drought also depends on the disciplinary perspective like meteorological, hydrological and agricultural drought (Wilhite and Glantz, 1985). The economic costs of drought include not only the losses in agricultural production but other economic and social costs, the impacts being noticeable in terms of food shortage and livelihood insecurity, increasing poverty and negative environmental consequences.

Rainfed agro-ecosystem has a distinct place in Indian agriculture, occupying 58% of the cultivated area contributing 40% of the food grain production, support 40% of the human and 65% of the livestock population (Venkateswarlu and Prasad, 2012). The farming systems in rainfed areas are quite diverse with a variety of crops and cropping systems, agro-forestry practices and livestock

production. A lot of risk is involved in agriculture in the rainfed regions due to uncertainty of rainfall and occurrence of recurrent droughts (Pasha, 2000 and Misra, 2005).

The drought-prone areas of the country are confined to peninsular and western India primarily arid, semi-arid and sub-humid regions. An analysis of 100 years rainfall data revealed that the frequency of 'below-normal rainfall' in arid, semi-arid and sub-humid regions is 54 to 57%, while severe and rare droughts occurred once in every eight to nine years in arid and semi-arid zones. Among the drought years, the drought of 1987 was one of the worst of the century, with an overall rainfall deficiency of 19%. It affected 59-60% of the cropped areas and a population of 285 M. In 2002 too, over 300 M people spread over 18 states were affected by drought in varying degrees. Around 150 M cattle were affected due to lack of fodder and water and food grain production registered the steepest fall by 29 M tonnes. No other drought in the past had caused reduction in food grain production to this extent (Samra, 2004).

India still does not have a well-defined drought mitigation policy, although it was stipulated to set up a