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Role of Indian ocean temperatures on droughts over Andhra Pradesh

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सार - छोटे अनुपात के क्षेत्रों के लिए सूखे का विश्लेषण करना, अनेक उपयोगकर्ताओं, खास तौर पर योजनाकारों के लिए आवश्यक होता है। इस शोध पत्र में 1950 - 2000 की अवधि में आंध्र प्रदेश में सूखे से प्रभावित क्षेत्रों और अलग-अलग महीनों में बंगाल की खाड़ी में समुद्र सतह तापमान (एस एस टी) की विसंगतियों के बीच पाए गए सहसंबंध पर विचार करते हुए आंध्र प्रदेश राज्य में सूखे पर हिंद महासागरीय तापमानों के प्रभाव का विवेचन करने का प्रयास किया गया है। विभिन्न ग्रिडों पर बंगाल की खाड़ी में समुद्र सतह तापमानों पर नज़र रखते हुए आंध्र प्रदेश में सूखे की पूर्व चेतावनी देने में यह अध्ययन अत्यंत उपयोगी सिद्ध होगा और यह योजनाकारों के लिए लाभकारी होगा।

ABSTRACT. Analysis of drought over a smaller scale region is requirement of many users, mainly planners. In the present study an attempt has been made to see the impact of Indian Ocean temperatures on the droughts over Andhra Pradesh state by considering correlation between sea surface temperature (SST) anomalies over Bay of Bengal during different months and area affected by drought over Andhra Pradesh state during the period 1950 - 2000. The study would be useful in the early warning of drought over Andhra Pradesh by monitoring of sea surface temperatures over Bay of Bengal in different grids and would be beneficial for planners.

Key words – Drought, SST over Bay of Bengal, Andhra Pradesh.

1. Introduction

A study of sea surface temperature and other parameters over Indian Ocean region in some years of contrasting southwest monsoon rainfall in India was made by Singh (1983). Joseph and Pillai (1984) examined inter annual variation of sea surface temperature and Indian monsoon rainfall. Rao and Goswami (1988) have worked on Inter annual variation of SST over the Arabian Sea and Indian Ocean. Study of initial state of North Indian Ocean and subsequent summer monsoon was made by Singh (1996, 1999). Soman and Slingo (1997) have studied on sensitivity of Asia Summer monsoon to aspects of sea surface temperatures in tropical Pacific and Indian Oceans. Clarke *et al.* (2000) have worked on Indian Ocean SST and Indian summer rainfall for predictive relationships and decadal variability. Bachiochi *et al.* (2001) studied the effect of Indian Ocean warming on the Indian monsoon. Rajeevan (2001) examined interaction among deep convection, sea surface temperature and radiation in the Asian monsoon region where as Rajeevan *et al.* (2002) studied predictive relationships between Indian Ocean sea surface temperatures and the Indian summer monsoon rainfall. Variability of the Indian Ocean in relation to monsoon and ENSO was studied by Krishnamurthy and Kirtman (2003). Pai (2003) worked on inter annual variation in the sea surface temperature threshold for the deep convection over north Indian

Ocean. Wu and Kirtman (2004) studied impacts of the Indian Ocean on the Indian summer monsoon and ENSO relationship. Khole and De (2004) have examined the association between the monsoon onset over Kerala (MOK) and Sea Surface Temperature (SST) over north Indian Ocean. South west Indian Ocean SST variability, its local effect and remote influence on Asian monsoon has been studied by Annamalai *et al.* (2005). The results indicated that Indian Ocean SST anomalies during December through May that develop in response to both atmospheric and oceanic processes, El-Nino need to be considered for a complete understanding of regional climate variability, particularly around the Indian Ocean.

Earlier studies cited above were for whole of India. Some of the studies on drought, dry and wet spells etc. are made on regional scale. In IMD publication "Climate of Andhra Pradesh" (1973), various meteorological parameters and other derived parameters including drought have been studied. Study of dry and wet spells over Meteorological sub-divisions of India were studied by Gore (2000), droughts over Andhra Pradesh were studied by Gore (2002). However impact of SST on droughts over Andhra Pradesh are not studied on regional scale. In the present paper we intend to study the regional droughts over Andhra Pradesh in association with SST over Bay of Bengal for the period 1950-2000.