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EVALUATION OF PRECIPITATION ENHANCEMENT IN ANANTAPUR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

Precipitation enhancement experiments were carried out in 12 districts of Andhra Pradesh for a period of five years. The experiments involved primarily treatment of warm clouds in the monsoon season with hygroscopic cloud condensation nuclei (CCN) to enhance precipitation in the region. The cloud condensation nuclei used was calcium chloride in the particle size range of 1.0 microns to 10 microns. Radar data and ground truth were used to evaluate the impact of inducing the cloud condensation nuclei into the cloud bases using aircrafts. The Index of Coalescence Activity (ICA) has been calculated for the 12 districts as a predicator of the cloud collision coalescence activity. The data was found to be in the range on the positive side from +4.7 to as high as +23.2 indicating that warm cloud seeding mechanism has to be followed for tropical conditions. The regression equations were calculated and GIS based maps were drawn to analyze the influence zone and evaluate extent of precipitation enhancement. Statistical methods such as single ratio, double ratio method, impact coefficient, target control and downwind comparisons are used to arrive at the percentage increase in rain mass over this region. This paper details the operations and results in 12 districts for the period 2005-2007 with specific reference to Anantapur district. The results clearly indicate that the mechanism of precipitation enhancement in this region of India is through the coalescence process.

KEYWORDS: Index of Coalescence Activity, Hygroscopic Seeding, Cloud Condensation Nuclei, Impact Coefficient