# CHAPTER I

## INTRODUCTION

The World is going to face an acute food shortage in the coming years as forecasted by FAO and World Bank, in spite of the most modern technology available in the advanced and developing countries. Despite the availability of abundant surface and ground water in India, the average irrigated land is still less than 25 per cent of the cultivated area. The average intensity of cropping for India being 1.16, clearly put forth the fact that large percentage of cultivated area is being irrigated during the kharif season when rainfall is in abundance in this part of the country. A critical review by eminent economists revealed that an hectare-centimetre of ground water costs more than rupees ten on no loss - no profit basis. It reveals the necessity of judicial use of irrigation water. In addition, coastal states like Orissa and West Bengal suffer from drainage due to excessive precipitation.

Study of rainfall probability or development of isoprobable maps is of great concern for water management planning. India Meteorological Department, Pune prepared isoprobable maps at a certain probability to identify drought areas for the whole of India except eastern region. In fact, depending on the need the probable expectancy varies. For example, in case of irrigation planning a probability of 60 or 80 per cent is reasonable while for drainage purpose 40 or 20 per cent has to be considered.

Keeping in view of the need, the research project had been conceived with the following specific objectives:

1. To establish the best straight line relationship between plotting position and rainfall over a probability graph sheet using suitable transformation.

2. To prepare isoprobable rainfall maps for the eastern region of India for different months of probabilities of 20, 40, 50, 60 and 80 per cent.

3. To show the applicability of isoprobable rainfall maps in water management planning by a case study.