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REVIEW ARTICLE

WATER BALANCE AND CROPPING PATTERN WITH REFERENCE TO WARANGAL DISTRICT OF TELANGANA STATE

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ABSTRACT

Warangal District of Telangana State is predominantly agricultural in its economy. About 72% of the total geographical area of the district is suitable for cultivation. Due to rain fed agricultural and limited irrigation facilities, the area under cultivation and production will be largely influenced by the success or failure of monsoon. The study aims at analyzing the water availability and requirement of crops through water balance approach and the cropping pattern of the district.

INTRODUCTION

The success of Indian agriculture depends mainly on the monsoon rains since rainfed agriculture account for over 98 million hectares or 70 percent of cropped area. The analysis of rainfall employing water balance technique is of immense help determining the crop season based on water surplus, water deficit and soil moisture recharge and utilization.

Climatic water balance provides an estimate of water availability and requirement to crops in relation to rainfall and potential evapotranpiration. By employing water balance technique Pail *et al* (1986) studied the influence of agricultural droughts on crop yields. Sigh and sinha (2004) have applied water balance for irrigation analysis in Bihar.

Drought prone area of Telangana like most of other parts of the country is basically agricultural and rural. However agriculture of this area dissipate limited irrigation facilities, coarse, shallow and poor quality soil and precarious and erratic rainfall has given way to a verity of crop patterns to adjust with prevailing best possible alternative cropping system. In view of increasing pressure of population on land and the growing demand for food and other materials. Agriculture land use refers the proportion of area used to grow different crops during the agriculture enter year.

Study Area

Warangal district falls under Telangana state. Warangal district lies in the North- East part of Telangana between the latitudes of 17^{O} -19^{1} and 18^{0}-36^{1} degrees North and longitudes 73^{0}-49^{1} and 80^{0}-43^{1} degree east, covering an area of 12,835.5 sq. k.ms. The average elevation is 870 peaks above sea level.

Warangal district is bounded on the North by the Karimnagar district, on the West by the Medak district, on the South by the Nalgonda district and on the Southeast by the Khammam district.

The district receives a mean annual rainfall of 991 mm of which 806 mm is received during south west monsoon and 118 mm during north east monsoon. The dominant soil types in the district are black soils and red soils. The district has an area of 147000 ha under rain fed situation (31% of net sown area). The major crops cultivated in the district are rice, cotton, maize, chilies and turmeric.

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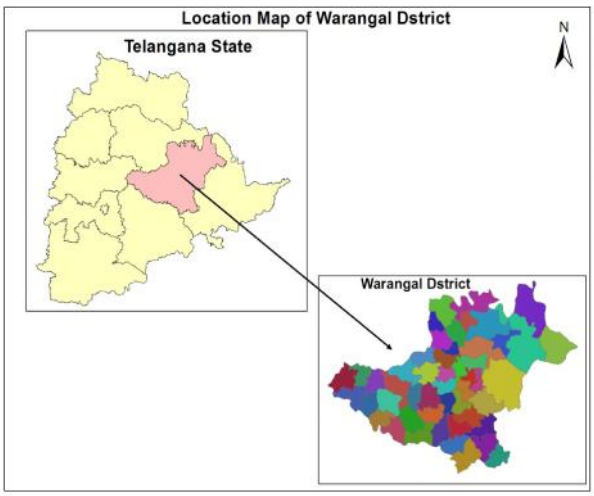

Source: Telangana State Remote Sensing Application Center (TSRAC)

Objectives

1. To identify water balance in the Warangal District.
2. To examine the cropping pattern in Warangal District.

DATABASE AND METHODOLOGY

The present paper is primarily based on secondary data. The data collected from Statistical hand books (Warangal district statistical handbooks 2001 and 2011) and Economic review of Telangana, published by the directorate of Economics and Statistics, Government of Telangana (2014-2015). Considering a mandal as a unit for the Warangal district of Telangana, The data pertaining to the period from 2000-01 to 2010-11.Further all sorts of published and unpublished data were processed and then suitable maps are prepared with using GIS software. We are studying the methods necessity to subject. E.g. area irrigated under different source, irrigated area under different crop and land utilization etc.

DISCUSSION AND ANALYSIS

Water Balance

The average annual rainfall of the district is 955 mm, which ranges from nil rainfall in December to January to 272 mm in July. July and august are the wettest months of the year. The mean seasonal rainfall distribution is 797 mm in southwest monsoon (June-September), 115 mm in northeast monsoon (Oct-Dec), nil rainfall in winter (Jan-Feb) and 43mm in summer (March May). The percentage distribution of rainfall, season-wise, is 83% in southwest monsoon, 12 % in northeast monsoon, nil percentage in winter and 5 % in summer. The annual rainfall during 2012 is 1232mm.

The annual rainfall ranges from 655.2 mm in 2009 to 1353.3 mm in 2010. The annual rainfall departure ranges from -31 % in 2002 and 2009 to 42 % in 2010. The southwest monsoon rainfall contributes about 83 % of annual rainfall. It ranges from 504 mm in 2009 to 1123 mm in 2010. The year 2002 and 2009 experienced drought conditions in the district as the annual rainfall recorded in these two years is 31 % less than the long period average (LPA). The annual and seasonal rainfall distribution with its departure from mean along with year-wise percentage distribution is given in Fig.1. It indicates that, the rainfall departure as on 2011 is positive i.e. 41%, showing excess rainfall.

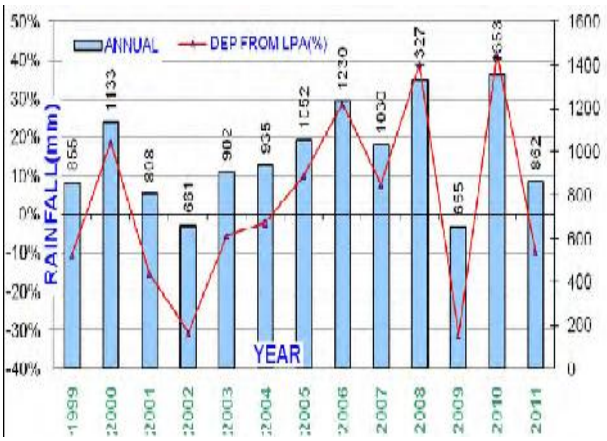

Fig.1 Cumulative departure of annual rainfall from LPA - Warangal district

Cropping Pattern

Table1 Area of Principal Crops irrigated in Warangal District

S.No	principal Crops	Area in Hectares(2001)	Area in Hectares(2011)
1	Paddy	179524	263099
2	Maize	40140	32885
3	Cotton	182477	114002
4	Chilies	27538	20874
5	Turmeric	9801	9724
6	Onions	191	303
7	Other Vegetables	2965	6359
8	Groundnut	45333	25349
9	Gingelly	19691	54
10	Sunflower	710	102
11	Tobacco	1122	118

Source: Chief Planning office, Warangal

In study area the short term cropping pattern like rice, cotton, and maize was dominating. The land under the paddy cultivation were increased by 179524 hectares to the 263099 hectares were as in study in turmeric and chillies land under cultivation declines from 9801 hectares to 9724 hectares and 27538 hectares to 20874 hectares, where as the cash crop like cotton cultivation were dominating in the district.

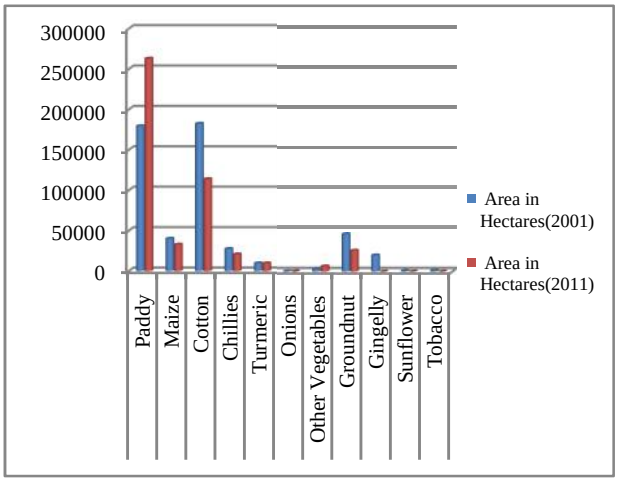

Fig. 2 Cropping Pattern in Warangal District

Surprisingly cash crop like cotton cultivation decreased from 182477 hectares to 114002 hectares. The paddy crop cultivation practices were increased due to irrigation project (kakatiya canal project) available in study area attracting the farmers from indigenes to paddy crop. This indicates the surface water availability impacting on land use pattern and agricultural economy.

CONCLUSION

In the present study the data reveals the landuse pattern and the irrigation practices in the Warangal district. The data from 2001 to 2011 of the irrigation practices reflects the land use pattern of a district.

The East and southern part of the district mostly influenced by irrigation Facilities (pakal lake, laknavaram lake and Godavari river), the minor irrigation project also enhances the landuse pattern in comparison with the data, the district scenario mostly dominated by cash crops in western part. Whereas the study area which came under rain shadow area i.e. list availability of monsoon. Which influences the irrigation facilities the present study area in not having any major irrigation project the partially depend on kakatiya canal irrigation. The agriculture pattern reflects mostly the tube well and dug well is a prime source for irrigation. The cropping pattern mostly reflects the short term crops like jowar, sunflower, gingelly, groundnuts and gram.

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