

AGROCLIMATIC CLASSIFICATION OF KARNATAKA (KHARIF CROP SEASON) ACCORDING TO HARGREAVES

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ABSTRACT

The agroclimatic classification of Karnataka was done for kharif cropping season using the weekly rainfall at 70% probability and Penman potential evapotranspiration. In the State arid climate was observed in the eastern part and semi-arid climate in the central region, with a narrow sub-humid zone in the western region and a parallel humid belt to the west of it. The coastal region showed a per-humid climate.

INTRODUCTION

Increasing attention is being paid to the rainfed agriculture. Year to year variation in the yield because of the rainfall fluctuation is a common feature in the dry climates viz., sub-humid, semi-arid and arid types. It is an established fact that the probability of rainfall is higher in high rainfall areas compared to the low rainfall areas.

Subramaniam (1964) classified the climate of Karnataka according to Thornthwaite's scheme. Hargreaves (1971) defined moisture available index (MAI) as the ratio of the rainfall value expected with 75% probability for the concerned period to the potential evapotranspiration (PET). He used the assured rainfall instead of the normal rainfall and thereby eliminated the year-to-year fluctuation. The index is a ratio of the income of water to the crops (rainfall) to the expenditure of water by the crops (PET).

Virmani et al. (1978) classified the dry climates of India according to the Hargreaves method, using the monthly data. Sarker and Biswas (1986) classified the dry climates of India according to the same method, but using the weekly instead of monthly data, the rainfall probability selected being 50%.

In the present paper an agroclimatic classification of the entire Karnataka State including all the climatic types for the kharif season, according to Hargreaves, using the weekly data is attempted.

MATERIAL AND METHODS

The weekly rainfall probabilities, for all the district head-quarters in Karnataka, were obtained from the Bureau of Economics and Statistics, Bangalore. The monthly normals of Penman PET for all the stations except Kolar, Mandya, Tumkur and

Chikmagalore were collected from the Scientific Report of Rao et al. (1971). The weekly PET values were obtained by interpolation from the monthly values for the kharif (4 June to September 30 i. e. 23 to 39 standard week). The MAI for each week, for all the stations, was obtained as a ratio of the rainfall with 70% probability to the PET. The agroclimatic classification was done according to the following scheme:

MAI	Climatic type
0.00 — 0.24	Arid (D)
0.25 — 0.49	Semi-arid (E)
0.50 — 0.99	Sub-humid (F)
1.00 — 1.49	Humid (G)
> 1.50	Per-humid (H)

A station was assigned the particular climatic type provided the MAI values for at least three consecutive weeks fell in the corresponding class interval.

The agroclimatic classification of Karnataka, for kharif was superimposed on the soil map (Fig. 1).

RESULTS AND DISCUSSION

The climatic belts are nearly running north-south (Fig. 1). The arid climate is observed in the major parts of Gulbarga, Bijapur, Raichur, Bellary, Chitradurga and a pocket in Tumkur districts. A minor pocket of arid climate is seen around Mysore.

Bidar, the western part of Bijapur, Raichur, Bellary the eastern parts of Belgaum Dharwad, Shimoga, Chickmagalur, Hassan, nearly the entire region of Bangalore, Mysore, Mandya Kolar and large portion of Tumkur are occupied by the semiarid climate.

A narrow zone running from north-south belongs to the sub-humid climate, which is found to the west of the semi-arid belt.

Similarly another zone covering the humid climate runs nearly parallel to the west of the sub-humid climate.

The per-humid climates is mainly observed in the coastal belt of north Kanara and south Kanara districts.

A comparison with the classification of Karnataka climate according to Thornthwaite by Subramaniam (1964) revealed that there was, in general, a good similarity except that the arid belt in the present classification was larger and extended into the north-east Karnataka. The present classification is for kharif crop season, whereas

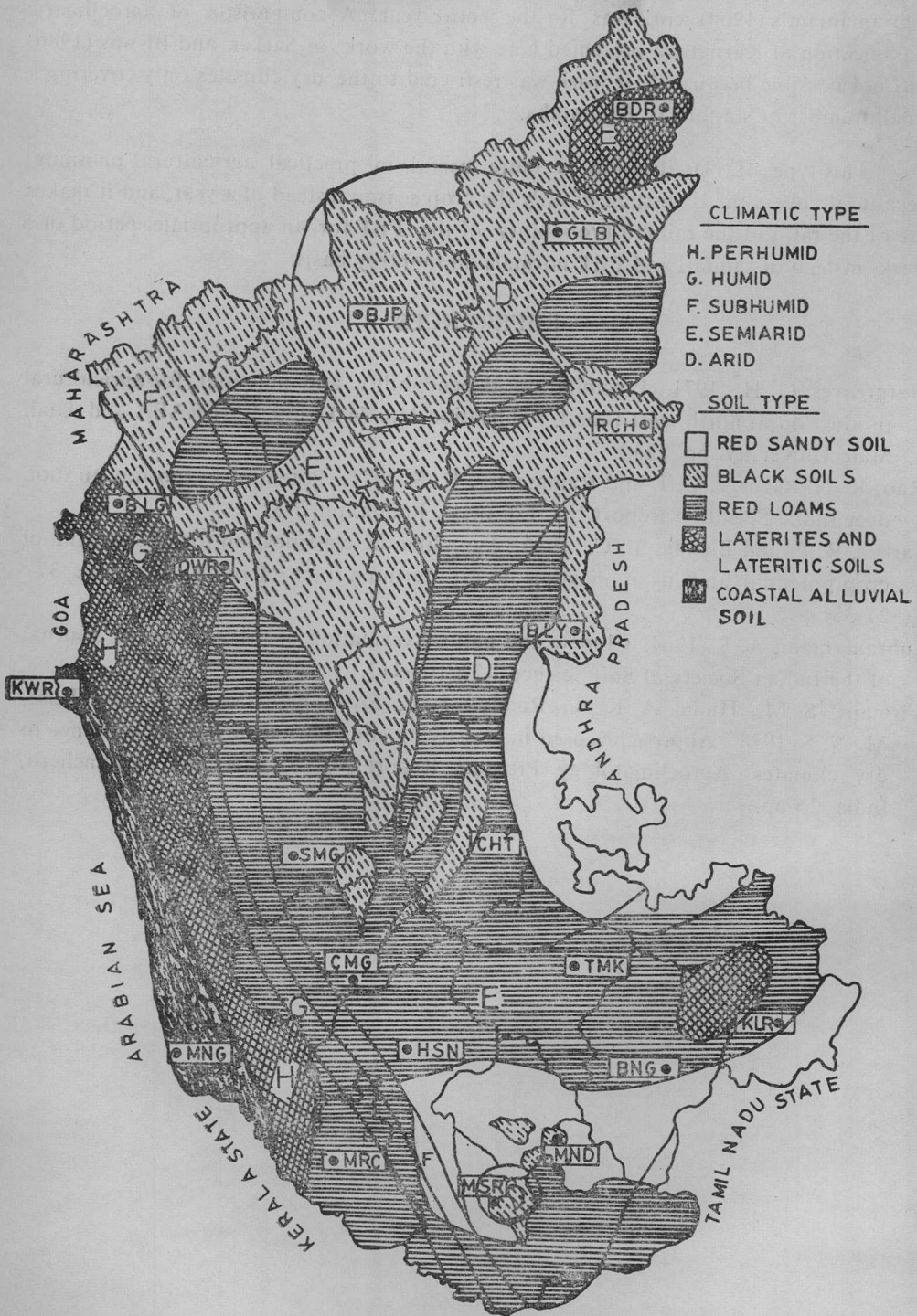


Fig. 1. Agroclimatic classification of Karnataka (kharif crop season) according to Hargreaves

Subramaniam's (1964) work was for the entire year. A comparison of agroclimatic classification of Karnataka presented here with the work of Sarker and Biswas (1986) was not possible because their work was restricted to the dry climates only covering a small number of stations in Karnataka.

This type of classification is more useful in practical agricultural planning, because it covers the time-span of only the crop season instead of a year, and it makes use of the ratio of the rainfall probability of the PET for an appropriate period of a week, instead of rainfall and PET normals on monthly basis.

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