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Dr. I. C. GUPTA

Crop Production in Hot Desert of India

N. D. Yadava and I. C. Gupta

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CROP PRODUCTION IN HOT DESERT OF INDIA

N.D. Yadava and I.C. Gupta

TABLE OF CONTENTS

1. INTRODUCTION
2. CLIMATE
 - 2.1 Rainfall
 - 2.2 Temperature
 - 2.3 Sunshine hours
 - 2.4 Relative humidity
 - 2.5 Wind and dust storms
 - 2.6 Climatic water balance
3. SOILS
4. GROUNDWATER
5. LAND USE
 - 5.1 Sand dunes
6. AGRO-CLIMATIC ZONES
7. CROP PRODUCTION
 - 7.1 Crops and varieties
 - 7.2 Land preparation and sowing
 - 7.3 Fertiliser management
 - 7.4 Weed control
 - 7.5 Soil moisture conservation
 - 7.5.1 Mulching
 - 7.5.2 Amendments
 - 7.5.3 Water harvesting
 - 7.6 Irrigation with limited water
 - 7.7 Cropping systems
 - 7.7.1 Mixed cropping
 - 7.7.2 Inter cropping
 - 7.7.3 Parallel cropping
 - 7.7.4 Strip cropping
 - 7.8 Planting systems
8. ALTERNATE LAND USE SYSTEM
 - 8.1 Agroforestry system
9. SUMMARY
- REFERENCES

1. INTRODUCTION

The Indian desert, a hot season rainfall region covers an area of 28,600 sq. km with the boundary in the east of Aravalli ranges, whereas in the west it merges into the Pakistan desert. In the north, the desert extends to Punjab and Haryana states and in the south in Gujarat state. The arid zone of India covers about 12% of country's geographical area and occupies 31.7 mha of hot desert located in major part of Rajasthan (60%). The region is spread over six states viz. Rajasthan, Gujarat, Haryana, Maharashtra, Karnataka and Andhra Pradesh (Table 1). The northwestern part of the country constitutes almost 90% of the total arid zone area (Fig 1).

Table 1 : *Distribution of arid areas in different states of India.*

| States | Area (in mha) | Percentage of total arid zone of India | Aridity index (%) |
|-----------------------------|------------------|--|-------------------------|
| <i>(a) Hot arid zone :</i> | | | |
| Rajasthan | 19.60 | 61.0 | 78 |
| Gujarat | 6.22 | 19.6 | 76 |
| Punjab | 1.45 | 5.0 | 75 |
| Haryana | 1.28 | 4.0 | 74 |
| Maharashtra | 0.13 | 0.4 | 68 |
| Karnataka | 0.85 | 3.0 | 68 |
| Andhra Pradesh | 2.16 | 7.0 | 68 |
| Total | 31.70 | 11.8 (of India) | — |
| <i>(b) Cold Arid zone :</i> | | | |
| Jammu & Kashmir | 7.03 | — | 83 |

Source : Krishnan (1977).

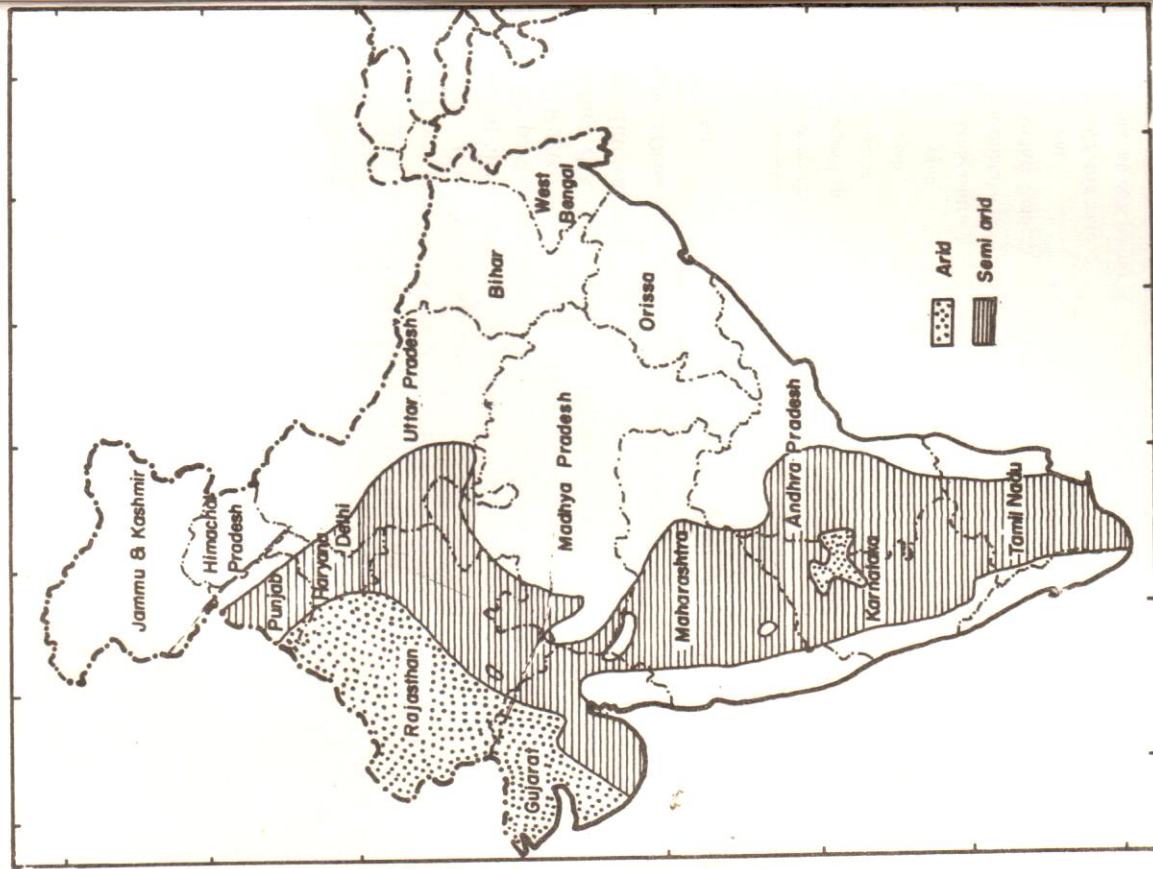


Fig 1. Arid and semi-arid zones in India

Principal arid zones of India are Saurashtra, Kutch and western Rajasthan (between 22° N to 30° E and 70° to 77° E) with some pockets over Bellary and Anaritpur of Karnataka and Andhra Pradesh and in Tirunelveli region of Tamil Nadu. The great Indian desert, also called the arid zone of northwestern India lying between 22° $30'$ N to 32° $05'$ N latitude and from 68° $05'$ E to 74° $45'$ E longitude, is mainly the part of Rajasthan in the west of Aravallis and covers the districts viz., Jaisalmer, Jodhpur, Pali, Barmer, Nagaur, Bikaner, Ganganagar, Sikar and Jhunjhuna. But they also extend in all the directions except towards the south east. The most outstanding common characteristics are low latitude, poor precipitation and constant drought. Some characteristics of the desert are given below :

- (i) The surface of desert is sandy, scantily watered and unproductive,
- (ii) Occurrence of wind eroded hollows or depressions of various sizes and shapes all over the area, particularly in eastern half of the region,
- (iii) Climate of desert is dry having extreme ranges of temperatures,
- (iv) Mean annual rainfall which is very erratic, varies from about 175 mm to 625 mm.
- (v) High temperatures and high wind velocity cause evaporation of the conserved moisture of the soil.

2. CLIMATE

The climate of Rajasthan, broadly, is an arid climate which is defined as the one where for a greater part of year, precipitation is less than potential evapo-transpiration and meets less than one-third of the annual water need. The arid zones are characterised by scarce and highly variable precipitation, extreme variations of diurnal and annual temperature with high evaporation. Donald (1959) has also pointed out two most important factors which lead to aridity viz. (i) Low frequency of occurrence of adiabatic rise of large bodies of air and (ii) the remoteness of the region from an oceanic moisture source in the prevailing wind directions.

2.1 Rainfall

Rainfall is precipitated partly from the south west monsoon by the diversion of monsoonic winds towards the area of low pressure