CROP BELTS AND CROPPING PATTERNS OF RAJASTHAN

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INTRODUCTION

Rajasthan is predominantly an agricultural state, about 75 per cent of the total population being directly or indirectly dependent on agriculture (Map 1). Of this 73.16 percent are cultivators and 4.11 percent are agricultural labourers (Raheja and Sen, 1964). In 1959-60 the total cropped area of Rajasthan was 14,446,700 hectares or 42 per cent of the total area. But this figure is not uniformly distributed. Then again, the increase of total cropped area is also not uniform. The agricultural condition of the state is still poor as is evident from the very low yield of the principal crops produced in the state.

The paper attempts to give the patterns of cropping in different districts of the state. The cropping belts have been cartographed and described.

CROPPING PATTERN

The density of cultivated lands and area and production of cereals, pulses and commercial crops in 1930-61 of the different districts of Rajasthan have been described by Raheja and Sen (1964). The highest concentration of agricultural land in the north east, is in the districts of Bharatpur, Alwar, Jhunjhunu, Tonk and Sikar where 50 to 75 per cent of the total area are cultivated. Density is very low in Bikaner and Jaisalmer due to the desert conditions of the tract and in Ajmer, Bhilwara and Sirohi on account of the rugged and hilly terrain of the tract. In the districts of western Rajasthan large areas are cultivated but the yield of the crops are low in comparison to those of the eastern part. Except in Ganganagar district where irrigation is practised, pulses and commercial crops are of little significance in the economy of Western Rajasthan.

Maps 2 and 3 show the distribution of cereals and pulses and commercial crops respectively in Rajasthan. These maps also incorporate, through pie graphs, the area under each crop in relation to the total area of the district. The following is the description of the geographical distribution of the principal agricultural produces of Rajasthan:

Cereals: (Map 2) Bajra (Pennisetum typhoides), Jowar (Sorghum vulgare) and small millets, although of secondary nature, are the most important cereals
produced in Rajasthan. Of the principal cereals, maize, wheat and barley are grown. The average yields of principal cereals in Rajasthan are higher, while those of secondary cereals are lower as compared to the all India average. This is because the primary cereals are grown in the wet eastern part of the state. The secondary cereals are mostly grown under rainfed conditions. In the arid tract the principal cereals are cultured under irrigation and confined to a limited area. Rice is also grown but only where there is adequate rainfall.

Bajra is the most important food crop in Rajasthan. Its straw is used as roughage. The total cultivated area under bajra increased from 37,64,610 hectares in 1956-57 to 46,17,508 hectares in 1960-61 and its production increased from 5,45,854 metric tonnes in 1956-57 to 9,51,434 metric tonnes in 1959-60. There was a fall in production in 1960-61 but this was due to the failure of monsoon. Good rains always bring bumper crops. The bajra crop is adapted to a wide range of rainfall conditions and grows satisfactorily between 100 mm to 510 mm of rainfall. This is grown mostly on the sandy soils of the districts of Barmer, Jodhpur, Nagaur, Bikaner, Jaisalmer, Sikar, Jhunjhunu, Churu, Alwar, Bharatpur, Jaipur, Jalore and Pali. A considerably small area under bajra cultivation in eastern Rajasthan shows its relative significance in the arid tracts of the state. The crop is sown in July after the first showers of the monsoon and ripens in October.

Jowar is consumed as food crop in the eastern and south eastern parts of the state and is an important fodder crop. It requires an annual rainfall of about 760 mm and thrives well between 500 mm to 760 mm in medium textured soils. This is sown in June and July and harvested in October and November. In 1960-61 10,37,825 hectares or about 10 per cent of the total cropped area was under jowar with a production of 2,96,614 metric tonnes against 10,54,607 hectares and 320,86 metric tonnes in 1959-60. The decline in area and production in 1959-60 is due to the failure of monsoon. But in general a steady increase in production is marked. This is mainly because of the irrigational facilities in the Chambal Valley. While bajra is the crop of dry zone, jowar is a crop of the semi-arid zone and is grown mainly in the rainfed areas of Ajmer, Tonk, Pali Bundi, Jhalawar, Kota and Bhilwara districts. The arid districts like Barmer, Jaisalmer, Jodhpur and Nagaur produce very little jowar. In Bikaner and Churu the production is insignificant. In Ganganagar district 8 per cent of the total cropped area is under jowar but this is mainly raised on irrigation.

Maize: This is the chief crop of the Aravalli districts. It is sown early in June-July and is harvested by the end of October. It is grown mostly in the 500 to 1060 mm rainfall zone and grows well in medium textured soils and the red and yellow soils. It is grown predominantly in the districts of Ajmer, Banswara,
Chittorgarh, Dungarpur and Udaipur districts. There is a gradual increase of the area under this crop from 5,01,054 hectares in 1956-57 to 6,49,036 hectares in 1960-61. Similarly, the production also increased from 3,29,085 M. tonnes in 1956-57 to 6,47,930 M. tonnes in 1960-61.

Wheat: Wheat is essentially grown under irrigation except in the areas of high rainfall in Sawai Madhopur, Bhilwara, Chittorgrah, Sirohi, Udaipur, Bundi and Kota districts. It is sown in October-November and harvested from the middle of March to the end of April. Although it is one of the important food crops of the state there has been a fall both in area and production from 13,54,587 hectares and 23,36,380 metric tonnes in 1956-57 to 10,69,440 hectares and 10,11,616 metric tonnes in 1960-61. There was, however, a considerable rise in production and area in Ganganagar and Kota districts due to increased irrigation facilities during the decade. Except in Ganganagar and Pali wheat is grown mainly in eastern Rajasthan or in semi-arid zone. But the good production in Ganganagar and Pali shows that it can be successfully cultured in West Rajasthan also, if irrigation facilities are provided.

Barley: In Rajasthan barley replaced wheat where either the soil is light or irrigation water is scanty or saline (Kala, 1964). It is sown in October-November and harvested in March-April. The physical and edaphic requirements are more or less the same as for wheat. Like wheat there is a fall in area and production of barley from 5,85,475 hectares and 7,21,236 metric tonnes in 1956-57 to 4,89,721 hectares and 5,68,432 metric tonnes in 1960-61 in spite of the increased production in Ganganagar and Jaipur districts due to irrigation.

Rice: Rice occupies only one per cent of the total cropped area in Rajasthan. The rainfall of Rajasthan and the sandy soils with low-moisture retaining capacity cannot permit its large scale cultivation. The total production was 64,586 metric tonnes in 1960-61 against 86,629 metric tonnes in 1958-59 and 87,333 metric tonnes in 1956-57. The total rice cropped area of course increased from 93,133 hectares in 1956-57 to 97,992 hectares in 1960-61. It is grown on the heavy soils of the districts of Banswara, Dungarpur, Bundi, Sikar, Udaipur, and Sawai Madhopur. There are prospects of increase in area under rice in the irrigated tract of the Chambal project.

Small millets: The total production in Rajasthan increased from 29,531 metric tonnes in 1956-57 to 35,972 metric tonnes in 1960-61. The total area under small millets increased from 74,826 hectares in 1956-57 to 78,602 hectares in 1960-61. These are mostly grown in Sirohi, Dungarpur and Banswara districts. They are also grown to some extents in Jalore, Pali, Bhilwara and Udaipur districts.
2. Pulses: (Map 3) In Rajasthan the area under rabi and kharif pulses is about 18.5 per cent of the total cropped area. This includes the production of gram tur (Cajanus cajan). Rajasthan is surplus in gram and exports it to the adjoining states. The production of pulses is widely distributed throughout the state but is more in evidence in Jhunjhunu, Sikar, Bikaner, Churu, Barmer, Jodhpur, Nagaur, Jhalawar, and Ganganagar and Kota districts. In the last two, irrigation plays a vital role in production of pulses.

iii) Commercial crops: Commercial crops, of which oil seeds, sugarcane, cotton and sun hemp are the most important, occupy only 9 per cent of the total cropped area of the state. Ganganagar shares a high proportion because of irrigational facilities (Map 3).

Oil seeds: Oil seeds constitute about 7 per cent of the total cropped area of the state. Rajasthan exports oil seeds to other parts of the country. Of the oil seeds, sesamum (Sesamum indicum), rape and mustard linseed (Linum usitatissimum), ground nut (Arachis hypogea) and castor seed (Ricinus communis) are grown extensively. Bharatpur, Alwar, Sawai Madhopur, Banswara, Pali, Chittorgarh, Jodhpur, Nagaur, Jalore, Kota, Jhalawar and Ganganagar are the principal oil seed producing districts of Rajasthan.

Sugar cane: It is generally sown in irrigated areas having rich soils in Ganganagar, Bharatpur, Sawai Madhopur, Tonk and Kota districts. But nowhere it exceeds more than one per cent of the total cropped area. The production increased from 6,89,740 metric tonnes in 1956-57 to 10,01,872 metric tonnes in 1960-61.

Cotton: The cultivation of cotton is gradually increasing. It is grown as a cash crop in Ganganagar, Chittorgarh, Udaipur, Jhalawar, Bundi, Pali and Banswara districts.

Of the other crops, tobacco and sun hemp are of some importance. Cultivation of these is concentrated in Jaipur, Udaipur and Chittorgarh districts. At Ganganagar sun hemp is gradually gaining importance.

(b) Intensity of cropping: Map 4 shows the intensity of cropping in Rajasthan in 1959-60. The intensity of cropping i.e. Total cropped area \( \times 100 \) was considered very low (less than 101), moderately low (101 to 110), low (110 to 120), medium (120 to 140) and high (140 and above). Arid districts of Churu, Bikaner, Jaisalmer, Barmer and Jodhpur are marked by a very low crop intensity. Districts towards the Aravallis, viz., Jalore, Sirohi, Pali, Nagaur, Sikar and Jhunjhunu which have higher rainfall and Ganganagar where 16 per cent of the total area is irrigated, have low cropping intensity. Three districts of the Chambel valley, namely Jhalawar, Tonk and Kota also belong to the same group due to both
high rainfall and increased irrigation facilities. The crop intensity is strikingly high in Dungarpur, Udaipur and Bhilwara districts. Moderate rainfall and irrigation facilities combine to make the crop intensity medium at Ajmer, Banswara and Chittorgrah. At Jaipur, Sawai Madhopur, Bharatpur and Sirohi it is low, the index being 110 to 120.

c) Crop belts of Rajasthan: On the basis of the geographical distribution of crops and their relative importance an attempt has been made to classify the state into major crop belts (Map 5). Cartographic delineation of boundaries was based on the 45 per cent or more coverage of the total cultivated land by the major crops produced. When such criteria were not met with, a minimum of 34 per cent of the major crop was taken as the basis provided the sum total of the next two major crops in order does not exceed more than 50 per cent of the total cropped area of the district under consideration. Such a belt was designed as “Secondary belt.” Within the belts in each district the uncultivated and cultivated lands along with the major crops were shown in linear graphs in the map.

The following belts have been demarcated:

1) Bajra belt: This belt covers 58.05 per cent of the total cultivated area of the state and 96 per cent of the arid zone cultivated land. This is largely cultivated in Jaisalmer, Barmer, Jalore, Jodhpur, Nagaur, Bikaner, Sikar, Jhunjhunu and Churu districts of Western Rajasthan and Jaipur and Alwar districts of E. Rajasthan. The total area of the belt is 1,982.01 sq. km. The rainfall belt varies between 103 mm. and 600 mm. Except Ganganagar, all the districts of Western Rajasthan where more than 90 per cent of the total cropped area is under bajra, come within this belt. Irrigation is not common. Other crops produced are jowar in Jaisalmer (3 per cent of total cropped area); Alwar (17 per cent of total cropped area); Jaipur (7 per cent of total cropped area); Jodhpur (4.5 per cent of the total cropped area); Nagaur (11 per cent of the total cropped area), maize in Alwar (4.5 per cent of total cropped area); wheat in Alwar (17 per cent of total cropped area); Jaipur (12.8 per cent of total cropped area) and Jalore (8 per cent of total cropped area); barley in Alwar (13.5 per cent of total cropped area); and Jaipur (22 per cent of total cropped area).

2) Secondary ‘bajra’ belt: There are three such pockets in the north in Ganganagar, in the east in Bharatpur and Sawai Madhopur and in the south in Pali and Sirohi districts. At Ganganagar, where earlier records depict bajra as the most important crop, it covers 39 per cent of the total cropped area, which but for irrigation would have been included in the bajra belt. Wheat is the next important crop in Ganganagar (38 per cent) and Sirohi (24 per cent). At Pali wheat (16 per cent) follows bajra (34 per cent) and jowar (35 per cent). Wheat is also an important crop in the third belt, consisting of Bharatpur (27 per cent)
3) **Jowar belt**: This belt lies in the south-east in Tonk, Kota and Jhalawar districts where 45.5 per cent, 47.0 per cent and 89.0 per cent respectively of the total cropped area is under Jowar. It is confined between 600 mm to 900 mm isohytes and comprises a total area of 25,783 sq. km or 7.54 per cent of the total area of the state. Other crops produced are Bajra in Tonk (5 per cent), maize in Tonk (8 per cent), Kota (3.5 per cent), Jhalawar (3.5 per cent); wheat in Tonk (27.5 per cent), Jhalawar (6. per cent) and Kota (46.5 per cent), barley in Tonk (14 per cent). Wheat is produced in Kota district under irrigation.

4) **Secondary jowar belt**: This is located in the Western part of the semi-arid zone in the districts of Ajmer and Bundi where 35 per cent and 40 per cent respectively of the total cropped area is covered by jowar. This is followed by maize in Ajmer (20 per cent) and wheat in Bundi (37 per cent). Other crops produced are bajra in Ajmer (14 per cent), barley in Ajmer (12 per cent) and in Bundi (6.5 per cent); maize in Bundi (10 per cent); wheat in Ajmer (17 per cent) and rice in Bundi (6.5 per cent). The variation in cropping pattern is mainly due to the fairly wide spread irrigation facilities and high rainfall in this belt. The area covered by this belt is 13,971 sq. km or 4.08 per cent of the State.

5) **Maize belt**: This belt lies in Udaipur, Dungarpur and Banswara districts. Here maize is also produced as a fodder crop. Other crops produced are wheat in Udaipur (18 per cent), Dungarpur (8 per cent), and Banswara (6 per cent) and barley in Udaipur (17 per cent) and Dungarpur (7.5 per cent) and rice in Dungarpur (31.5 per cent), Banswara (25 per cent), and Udaipur (5 per cent). The belt lies between 650 mm to 900 mm isohytes and suitable for rice cultivation, but the rugged terrain and absence of low lying plains prevent large scale paddy cultivation. The total area of the belt is 26,510 sq. km or 7.76 per cent of the total cultivated area of the state.

6) **Secondary wheat belt**: This is confined to Bhilwara and Chittorgarh districts between 500 mm to 750 mm rainfall lines and covers a total area of 20,437 sq. km or 5.98 per cent of the total cultivated area of the state. Other crops produced are jowar in Chittorgarh (24 per cent) and in Bhilwara (11.5 per cent); maize
in Chittorgarh (36 per cent) and in Bhilwara (9 per cent); barley in Bhilwara (36 per cent) and Chittorgarh (4 per cent).

SUMMARY

The findings in the study may be summarised as follows:

1) Rajasthan is predominantly an agricultural state where 75 per cent of the total population is directly or indirectly dependent on agriculture.

2) The highest concentration of agricultural land is in the north eastern districts of the state where 50 to 75 per cent of the total area is cultivated. The extent of cultivated lands is lowest in the districts of the arid zone.

3) The geographical distribution of crops reveals the predominance of secondary cereals like bajra, jowar and small millets. About 18.5 per cent of the total cropped area is under the pulses while only 9 per cent of the total cropped area is under commercial crops.

4) The intensity of cropping is very high in the districts of Chambal valley due to irrigation facilities and high rainfall and in Dungarpur, Udaipur and Bhilwara districts due to high rainfall. It is medium in Ajmer, Banswara and Chittorgarh districts. It is very low in the districts of Bikaner, Jaisalmer, Barmer and Jodhpur which form part of the Indian desert.

5) Six crop belts in Rajasthan have been demarcated and mapped on the basis of 45 per cent or more coverage of the total cultivated land and the area occupied by the major crop. Bajra belt is the most important covering 58.05 per cent of the total area. Other belts distinguished are secondary bajra belts (16.59 per cent); jowar belt (7.54 per cent); secondary jowar belt (4.08 per cent); maize belt (7.76 per cent) and secondary wheat belt (5.98 per cent).

ACKNOWLEDGEMENTS

Grateful thanks are due to Dr. P.C. Raheja, Director, and Dr. B.B. Roy, Head, Basic Resources Studies Division of the Central Arid Zone Research Instt., Jodhpur for their keen interest in the work. Data for statistical work were collected from the Statistical Abstracts published by the Govt. of Rajasthan in 1961 and 1962 which are also acknowledged.

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