

## Changing Landuse Pattern In Bundi District (2011-12 and 2021-22)

\*Dr. L.C Agrawal  
\*\*Dr. Prem Sonwal

### Abstract

The present paper aims to analyze the changing landuse pattern of agricultural development in Bundi district during 2011-12 and 2021-22. The study is based on the blockwise published data obtained from Statistical Department of Bundi district. The pattern of landuse development is not uniform in all the blocks of the district. The central part of the district enjoys high and medium level of agricultural development due to modernization of agriculture and subsequent urbanization of the region. In north & north western block which has medium level of development, the present plan strategies need to be slightly modified. In northern most parts of the district having low level of agricultural development which need special attention on a priority basis so that the level of agricultural development could be raised.

### INTRODUCTION:

Land resources form the base for the economic development of a region, and so their study in geographical perspectives is of paramount importance. The inventory of landuse resources makes connections between man and environment involving its opportunities and problems. Therefore in Bundi district the landuse deals essentially with the spatial aspects of all man's activities on land and the way in which the land surface is adapted, or could be adapted to serve human needs. The changing landuse pattern in Bundi district has been studied from 2011-12 and 2021-22.

The present study attempts to evaluate the basic land resources of Bundi district with the help of Landsat Imagery; Statistical records of the Directorate of Economics and Statistics, Govt. of Rajasthan; and Topographical Sheets.

Remote Sensing technique assumes special significance in Bundi. Moreover large landuse resources of the district are still awaiting exploration. Remote Sensing technique has been recently deployed in Bundi and since then has shown its inherent advantage in acquiring reliable data concerning productivity of land and the use of known landuse.

### STUDY AREA:

Bundi district takes its name from a narrow valley called 'Bunda-Ka-Nal'. Bunda was the grandfather of last Meena Chieftain, Jaita from whom Rao Deva conquered this territory in 1342 A.D.

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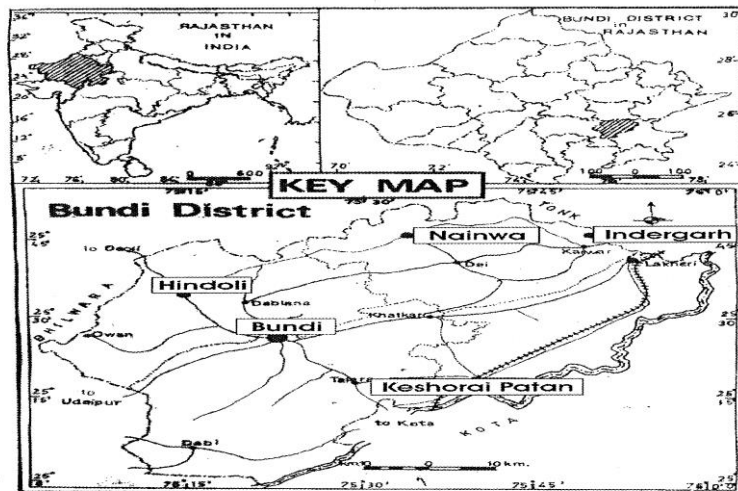
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Bundi district may be roughly described as an irregular rhombus. It is situated in the south-east part of Rajasthan, in between  $24^{\circ} 59'11''$  and  $25^{\circ} 53'11''$  north latitudes and  $75^{\circ} 19'30''$  and  $76^{\circ} 19'30''$  east longitudes. It has an area of 5,582.78 sq km which is only 1.62% of the total area of the state. The dimension of the district from east to west is about 110 km and about 104 km from north to south. The geological history of the area is associated with the geomorphic history of the Aravallis and Vindhyan. The Chambal River forms the south-eastern boundary separating Bundi from Kota. The other rivers of Bundi district are Mez, Mangli, Eais, Taleda Nadi, Ghora Pachhar. The natural lakes found in Bundi are Dugari lake, Jait sagar, Phool sagar, Naval sagar and Bhimlatt. Among other water resources, the left main canal of the Chambal project alongwith several local irrigation projects are the significant hydrological features. These hydrological features support hilly soils, shallow soils, soils of foothills, soils of rocky areas and the soils of plains. The last section of soils is agriculturally significant and is found in north and north western; south and south eastern parts of Bundi having good drainage system. On the other hand climate remains semi-arid type supporting less species of plants. The average annual rainfall of the district is 764.1 mm which also evaporates due to high temperature of  $25^{\circ}$ - $30^{\circ}$  C creating low pressure belt in maximum of the district which are light and medium type. As a result of erratic climatic conditions total reserved forest area is 800 sq km, out of which 647 sq km is preserved and 35 sq km are unclassified areas.

The total outcome in the form of landuse in Bundi district is 11, 8694 hectares (43.87%). The amount of landuse has not increased with the amount of population in Bundi district even after being supported largely by Command Area Development Programme. Therefore there is demand for increase in per hectare production.

Fig 1.1



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**OBJECTIVES:**

1. Classify the landuse of the study area and to assess their availability for human use.
2. To demarcate the changes in their landuse pattern.
3. To suggest measures for landuse planning with reference to the geomorphology of the region.

**METHODOLOGY AND DATABASE:**

The agricultural development is unquestionably a multidimensional concept of which cropping intensity is one of the vital aspects. The simplest and crudest measure of cropping intensity is the yield per hectare or percentage of various crops.

The Crop Concentration Method is used for the percentage share of a crop in the total cropped area. The Department of Agriculture, Govt. of India has adopted the following technique for the determination of crop concentration at the local, regional and national levels. This method will help Bundi district to have keener competition, with high degree diversification.

Cropping Intensity =

Where,

$$a_{ij} = \text{area under the } i^{\text{th}} \text{ crop in the } j^{\text{th}} \text{ year}$$

$$a_{iu} = \text{area under the } i^{\text{th}} \text{ crop in the base year}$$

$$N_i = \text{Net area sown in the } j^{\text{th}} \text{ year}$$

$$N_o = \text{Net area sown in the base year}$$

$$\frac{\sum a_{ij}}{\sum a_{io}} \times \frac{N_i}{N_o} \times 100$$

**Table 1.1**

**Cropping Intensity Tehsilwise (Percentage)**

Year	Tehsil	Cropping Intensity					
		Food Crops	Pulses	Sugarcane	Spices	Oilseeds	Vegetables
1995-96 and 2006-07	Bundi	145.60	19.12	36.00	50.2	138.4	49.9
	Keshorai	56.91	57.60	2.5	96.45	45.59	22.65
	Patan						
	Nainwa	96.57	156.96	57.05	80.54	107.9	13.73
	Hindoli	122.30	77.31	25.42	57.61	152.9	58.5
	Indergarh	53.12	98.54	4.0	82.05	49.06	13.3

**Source: Data Calculated by author**

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**OBSERVATIONS:**

First let us classify the landuse pattern and its present availability for human use in Bundi district with the help of this table:

Table 1.2

**Landuse Pattern in Bundi District (Hectares)**

Year	Tehsil	Total Geographical Area	Forests	Land used other than Cultivation	Land Not Suitable For Cultivation	Permanent Pastures	Barren Land	Total Fallow Land	Actual Sown Area	Area sown more than once
2011-12	Bundi	192227	60964	14923	18185	8133	9075	10367	70567	38833
	Keshorai Patan	135784	13412	12299	10947	4353	6275	16068	72365	31140
	Hindoli	134038	42907	7955	15942	5266	12408	6423	43094	17828
	Nainwa	118995	21568	5253	5023	5212	9248	8370	64258	8227
2021-22	Bundi	192227	61501	13242	19890	8426	7853	9260	72022	46672
	Keshorai Patan	135784	4633	8481	4135	2049	1119	4663	45525	23857
	Hindoli	134038	44230	8043	14064	5761	10097	7789	44033	24463
	Nainwa	118995	21610	5068	5533	5964	7747	10437	62617	15743
	Indergarh	66065	9841	4975	5667	2466	2836	10450	29776	6605

Source: Statistical Department, Collectorate Bundi

South West monsoons remain for a short duration making the area sub-humid between months of July and August. Sources of irrigation are large but unevenly and unequally distributed due to which per hectare production has gone down. On the other hand area under forests, actual sown area for once and more than once has shown a slight increase because of the increasing use of fertilizers in the same available cultivable land. According to the data available from the Statistical Department, Bundi in 2011-12 area under forests was 60,964 which have slightly risen to 61,501 in 2021-22 due to the increasing number of plantation programmes and awareness among the youth in Bundi district. After Bundi has been put under the CAD many measures have been taken to conserve the ecosystem. The drainage density and stream frequency of various rivers of Bundi district is

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constantly under check and control which has resulted in high volume of water so as to facilitate high irrigation facility.

On the other hand wherever the farmers are rich enough to afford all the modern technologies the actual sown area has also increased from 10, 9400 hectares in 2011-12 to 11, 8037 hectares in 2021-22. And in few tehsils of Bundi district like Nainwa and Indergarh land area sown more than once has increased from 2011-12 and 2021-22 which could be illustrated through this table :

**Table 1.3**  
**Changing Landuse under Area sown more than Once (Hectares)**

<b>Tehsil</b>	<b>2011-12</b>	<b>2021-22</b>
Bundi	38,833	46,672
Nainwa	8,227	15,743
Indergarh	17,828	24,463

To make observations stronger following suggestions regarding landuse planning and to increase the cropping intensity are:

1. Measures to be taken to reduce percentage of barren land, culturable wasteland and other uncultivated land. Measures should be taken in the form of proper use of manure and chemical fertilizers, distribution of improved seeds, better means of irrigation like tube-wells, establishment of agricultural research institutes, holding agricultural exhibitions, and proper guidance to farmers.
2. To provide adequate instruments for measuring temperature and humidity, so as to know the nature of land and the supportive climatic conditions for increasing net sown area. Farmers should be encouraged to use drills, ploughs, harrows and cultivators.
3. Poor farmers should be provided with some financial aid, to use various forms of modern technology. Co-operative and commercial banks should be established.
4. Exploring new culturable areas of the district like Neem-ka-kheda, Roteda, Bamangaon etc.

Lastly the observations were compiled in a form of map showing changing landuse pattern between 2012-12 and 2021-22.

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Table 1.4  
 Changing Landuse Pattern of Bundi District (2011-12 and 2021-22)  
 (Percentage)

Tehsil	2011-12					2021-22				
	Forests	Land not available for cultivation	Culturable Waste land	Fallow Land	Cultivated Land	Forests	Land not available for cultivation	Culturable Waste land	Fallow Land	Cultivated Land
Bundi	184.13	54.92	52.69	42.39	25.87	187.36	60.79	48.69	18.14	45.02
Keshorai Patan	57.69	47.09	58.68	42.51	154.03	33.14	38.33	29.52	22.93	236.08
Nainwa	209.88	48.88	63.67	64.44	DNA	203.79	49.45	60.71	63.92	DNA
Hindoli	179.54	66.71	70.03	35.91	7.81	195.33	63.98	63.44	23.24	14.01
Indergarh	DNA	DNA	DNA	DNA	DNA	91.40	45.03	55.53	27.37	140.67

Source: Calculated by Author

\* DNA - Data not available

Fig. 1.2 (a)

Map Showing Landuse of Bundi Year 2011-12

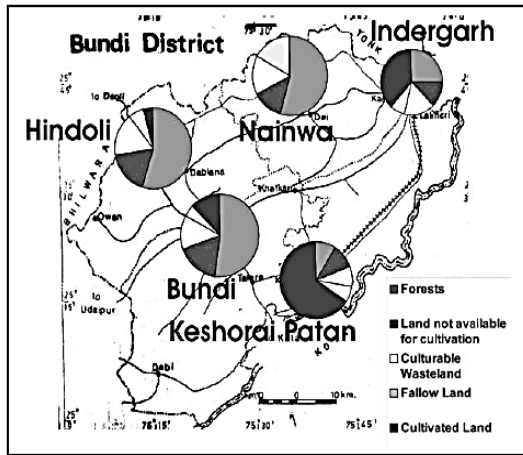
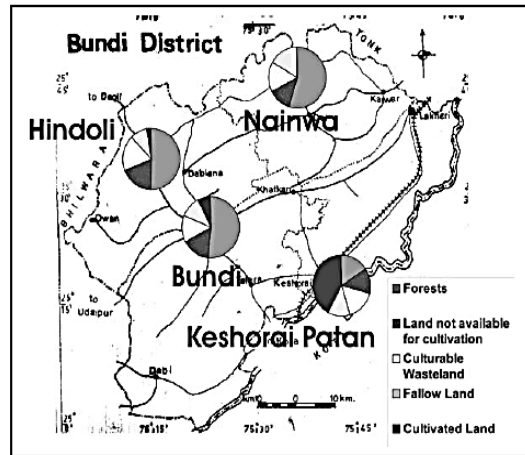


Fig. 1.2 (b)

Map Showing Landuse of Bundi Year 2021-22



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**RESULT AND ANALYSIS:**

The analysis of basic land resources shows that Bundi district is a land of great extremities and intra-regional contrasts but is richly endowed with mineral wealth, underground water resources and fertile soil, all of which have not yet been harnessed to the optimal level. A judicious use of landuse is required which may lead to decision making processes.

Analysis also shows that the possibility of any future extension of culturable land, to expand the agricultural base is limited. A large percentage of agricultural land, accounting for more than 23% of the cultivable land is left fallow every year. It is desired that this land can be utilized for cropping to meet the demands of cereal crops and fodder crops of the district. But this will need a heavy expenditure on the agricultural inputs to be incurred by the state.

Water which is present in abundance in the buried palaeochannels and the sandstone aquifers in the various parts of the region is yet scanty for domestic use and irrigation. The study shows that efforts have been made in the past decade to trap the ground water resources but these have been largely confined to the two tehsils viz. Keshoraipatan and Hindoli.

Observations also point out the problem of increasing population and most of the cultivable land has been used in the form of settlements. Even the increasing area under forests is used by the increasing number of population by cutting trees. Therefore there is need to increase per hectare production in the total cultivated area.

**COUNCLUSION:**

From the proceeding discussions it may be concluded that the pattern of landuse development is not uniform in all the blocks of the district. The central part of the district i.e. **Bundi and Keshoraipatan** enjoys high and medium level of agricultural development. It is due to modernization of agriculture and subsequent urbanization of the region. In **Nainwa and Hindoli** block which has medium level of development, the present plan strategies need to be slightly modified. In northern most parts of **Indergarh** block of the district having low level of agricultural development which need special attention on a priority basis so that the level of agricultural development could be raised.

**\*Professor**  
**Department of Geography**  
**Govt. Arts College, Kota (Raj.)**  
**\*\*Assistant Professor**  
**Department of Geography**  
**SCRS Govt. College, Sawai Madhopur (Raj.)**

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