

CONSTRAINTS AND CHALLENGES IN AGRICULTURAL DEVELOPMENT IN TRIBAL PRATAPGARH DISTRICT OF SOUTHERN RAJASTHAN

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Abstract: Agriculture and livelihood conditions of tribal population in hilly areas have always been neglected. These poor, economically and socially backward and illiterate people with poor health, small pieces of marginal land and negligible assets, are still struggling for their survival and a normal civic life. Pratapgarh is one of the fully tribal districts of southern Rajasthan. Being located within Aravalli hills and Malwa Plateau, the district has just 49.33 percent cultivated lands with poor GW potential. Looking into the gravity of problem, the present study has taken up to address the prevailing agricultural issues and challenges and came out with suitable and viable development strategies and technologies. Long term data from various sources on agricultural and human resources are analysed and interpretation of satellite imagery and SOI toposheets on 1:50, 000 scale are carried out for getting problems and potentials of natural resources. The cropping pattern is highly imbalanced, leading to food insecurity and malnutrition. Area under pulses is just 8.14 percent and cereals (mainly wheat and maize) 41.45 percent. On the other hand, oilseed crops viz. soybean and mustard grab 44.63 percent area. Though total agricultural production has increased by 90.9 percent since 2008-09 but food availability remained very poor. Cultivation of opium is subject dissatisfaction from farmers since they are not happy with Govt. policy. Again, the district is very poor in infrastructure development, industrialization and proper utilization of surface water resources. Measures and technologies are suggested for proper use and management of natural resources, increase crop production and productivity, ensure food availability and arrest malnutrition, creation of assets, infrastructure development, establish suitable industries, augment mineral exploration and make forest resources more useful and profitable.

Key words: Agriculture, Land Use, Tribal Population, Hilly Region, Mahi River Basin

Introduction

The tribal people facing agrarian development issues and challenges. These include scarcity of water and natural resources which lead to an inconsistency in food availability and nutrition. Tribal agriculture is characterised by small land holdings, improper land utilization, poor farming techniques, low capital investment and low production impact. Limited excess to inputs and resources making it difficult for them to compete with large player in market. Due to absence of employment opportunities in agriculture sector young people belongs to Scheduled Tribe communities are finding themselves in crossroad of life. Agriculture has been a relatively unrewarding profession due to low productivity, unfavourable prices and practically very little value addition (Sehgal, 2023). These challenges causes stagnation of agricultural growth and affected the livelihood of farmers and high food insecurity. Inefficient management of water resources is another challenge. Located within Aravalli hills and Malwa plateau, Pratapgarh is one of the fully tribal districts of Rajasthan. As cited above the district is subject to all such a problems/constraint. Arable land is just 51 percent and rest of the area is occupied by hills and forest. Most of the rivers outflow towards adjoining regions of Gujarat and Madhya Pradesh The present study thus aims to examine the present status of biophysical resources in integrated manner, find out the resource potentials and suggest appropriate measures and viable technologies as well as alternate land use systems for sustainable development of agriculture and improvement of livelihood conditions of farmers and employment avenues.

Study Area

Pratapgarh district was created on 26th January, 2008 by taking away the area from Pratapgarh, Chhoti Sadri and Arnod tehsils of Chittorgarh district and Dhariawad tehsil of Udaipur district. Peepalkhoont tehsil was created by taking 27 villages from Arnod tehsil and 94 villages of Ghatol tehsil of Banswara district. The district is located in southern part of Rajasthan and bounded by Udaipur district in the west; Chittorgarh towards north, and Banswara district towards south. Towards east it is bordering with Neemuch, Mandsaur and Ratlam districts of Madhya Pradesh from north to south. The district thus extends from 28° 42'33" to 30°12'16" north latitudes to 72°30'33" to 74°17'51" east longitudes and covering an area of 4456.46 km² (Fig.1). The district drives its name after Rawal Pratap Singh who reigned from 1623 to 1708. This region was also called Kanthal Nagari.

Method and Materials

Interpretation of SOI toposheets on 1:50,000 scale are carried out for appraisal of physical features of the district. Visual interpretation of Landsat/Copernicus data from Google Earth and Sentinel-2A MSI data of 16.2.2024 and 28.2.2024 (Fig. 2) of the district has also been carried out to get present status of land features including the cropped/irrigated area and also dams/reservoirs and drainage network (Fig.3). The distribution of landforms, geological formations got from Hydrogeological Atlas (GWD and EUSPP, 2013) and soils from Soil Resources Atlas of Rajasthan (SRSAC, 2010). Reports of CGWB (2013, 2024) are used to work out various aspects of ground water resources. Reports of Water Resources Dept. (2024b) are consulted to get location and workout the status of various rivers/dams/reservoirs. Reports of Forest Department (2008 add 2024) are consulted to assess distribution, health and area of forest over the region. District Census Handbook, 2011 (Census of India, 2014) has been used to analysis various aspects of human resources. Data on land use, irrigation, cropping pattern and crop production has been taken out from Agricultural Statistics of Rajasthan from 2008-09 to 2022-23 and systematically analysed and tabulated For poverty, food security, livelihood condition and agricultural and peasants problems, the research work of various authors viz. Niti Aayog, (2023, 2024), NFDB, 2014, Newar et al (2017), Sehgal

Foundation (2023), Chotila and Chaudhary (2014), Singh and Sharma (2018) and Jatav et al. (2022) are considered.

Figure 01

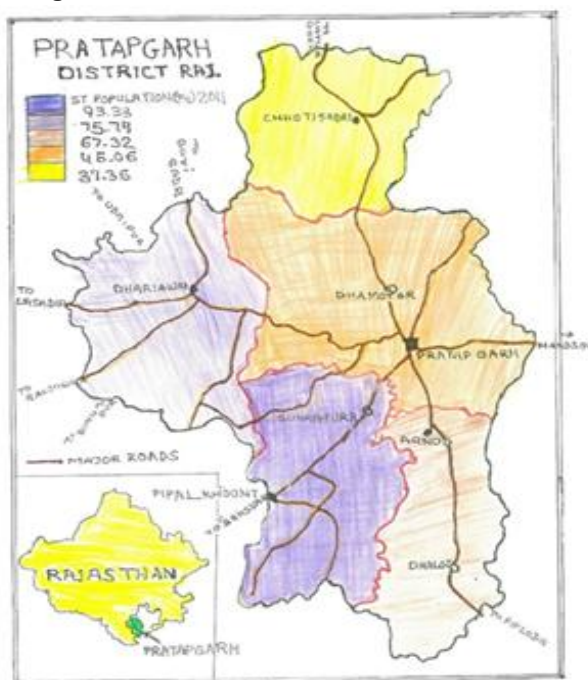


Figure 02



Results and Discussion

Climate: The district comes under Sub-humid southern plain and Aravalli hills Agro-climatic Zone. Average annual rainfall from 2013 to 2022 comes to 1145.45 mm while average mean rainfall from 1901-2017 comes to 806 mm. In 2022 the average annual rainfall was 1129.6 mm which varies from 722 mm towards northwest to 1183 mm towards SE. Number of rainy days are 34. Mean annual rainfall and CV in Arnod tehsil comes to 1127.7 (39.4 percent), Peepalkhoont 916.4 (40.9 percent), Pratapgarh 916.4 (48.8 percent), Chhoti Sadri 884 (31.9 percent) and Dhariawad 858.2 (31.8 percent). Mean minimum temperature during winter dips to 7.4°C and mean maximum during summer 46.0°C. Minimum temperature ranges from 10 C° to 20° C and maximum from 35° C to 46° C (CGWB, 2023).

Landforms and Geology: Pratapgarh district lies at the junction of Aravalli hills and Malwa plateau. Slope is from east and north-east to south west and elevation from MSL varies from 204.9 to 576.9 meters. Hills is the most dominant landform constituting 37.17 percent area of the district. This is followed by buried pediment 27.41 percent, alluvial plains 17.88 percent, pediment 7.41 percent, alluvial plains 17.88 percent and valley fill 10.17 percent respectively (SRSAC, 2010). The exposed rocks system of the district belongs to Bhilwara, Aravalli and Vindhyan Super Groups. Deccan traps occupy significant area of eastern, southern and central parts. Bhilwara group consist Shale, slates, phyllites, limestone and dolomitic marble exposed in western, north western and south western parts. Rocks of Aravalli Super Group consist of Phyllite, mica schist, quartzite, dolomite and migmatite while exposure of Vindhyan formation are shale, sandstone, conglomerate, limestone and siltstone. These are mainly occurred in northern part (GWD and EUSPP, 2013).

Drainage: A major part of the district is drained by the rivers of Mahi River basin (2993.52 Km² or 73.62 percent) and small parts by Chambal River basin (895.2 Km² or 22.02 percent) and Banas River basin (177.3 Km² or 4.36 percent). Rivers from these basins flow towards west, east and north direction respectively. Jakham is largest tributary of Mahi River which has sub-tributaries viz. Soneri Warda or Varda, Kharar, Karmai (sub-tri. Tankia, Bhuldo and

Sitamata), Binatel, Nalwa, and Sukli (Sub-trib. Chanavi or Sarwari), Sarwania, Kundi Nala and Bhatwara. Erau is another important tributary of Mahi which has Kamaliya Khal and Avani sub-tributaries. Others are Mudur and Chikli. Shiwana or Sau (Trib. Rojar, Ninori and Dudia Khal) and Retam are main rivers of Chambal River basin. A small northern part of Chhoti Sadri is drained by Daru and Kodmali streams of Banas River basin (Fig.3).

Figure 03: Drainage Map



Soils: The district is poor in soil resources since a large area (about 45 percent) is occupied by hills and pediments which leaves rare possibilities of agriculture expansion. Soils are predominantly reddish, well drained, calcareousness and of medium texture. Hills are associated with loamy skeletal soils, shallow buried pediments with loamy skeletal clayey and deep buried pediments with coarse loamy to fine loamy soils. Alluvial plains are characterised by fine texture montmorillonite typic soils while valley fill with fine typic haplustent soils. In general, black loam soils occur in 57.44 percent, clay soils 38.38 percent and red soils 4.18 percent area. So far, the land capability is concerned, Class II and III land occupy 28.91 percent and 22.47 percent area. Class IV lands occupy 8.77 percent area; class VI 8.29 percent, Class VII 21.91 percent and Class VIII 9.65 percent respectively (SRSAC, 2010). Class II lands occur mainly in Arnod and Pratapgarh blocks and Class III lands in Dhariawad, Chhoti Sadri and Pratapgarh blocks.

Water Resources: Hydrogeologically the district features are poor to moderate potential area due to poor vegetative cover, enhanced high surface runoff and soil erosion. GW is highly restricted to particular flow and governed by the fractures-controlled aquifers. Total water requirement is 912.6 Mm³/year. Total annual GW recharge (as on 31.3.2023) comes to 22764.24 ham and annual extractable ground water resources 20488.37 ham. Current GW annual extraction is 26328.16 ham. Net GW availability for future use comes to 974.18 ham and stage of GW development 128.5 percent (CGWB, 2024). Mean pre and post monsoon water level comes to 15.69-6.07 m in Chhoti Sadri; 4.53-9.84 in Arnod; 8.23-4.84 in Dhariawar; 4.53-8.4 in Pratapgarh and 6.12-11.26 meters in Peepalkhoont (Gautam et al., 2022). Only Peepalkhoont tehsil is safe in GW exploration; Dhariawad in critical stage Pratapgarh and Chhoti Sadri are over-exploited. GW is gradually declining in Chhoti Sadri and Pratapgarh block (Gautam et al 2022). In general, GW is good for irrigation but the value of SAR, RSC, salinity, Na and K (Potassium) exceeding permissible limit. For surface water storage, there

is one large dam (Jakham) with storage capacity of 142.030 Mcum and two canals of 34.12 km and 39.9 km length. There are 8 medium bunds and 11 small bunds with a total storage capacity of 81.81 Mcum and 26.05 Mcum (Anon. 2024). Besides, there are 19 minor irrigation project bunds with storage capacity of 2083.73 Mcft. under Panchaytiraj Department (Anon. 2017),

Mineral Resources: The district is poor in mineral exploration. Only few minor minerals are produced. During the year 2021-22 the total mineral production of the district was 2465137 tons (Anon. 2022a). This includes marble 5712137, limestone 263, masonry stone 3962311, phyllite schist (Patti katla) 2815, kankar bajri 117666, mitti 54862, soapstone 103594 and red ochre 1218490 tons respectively.

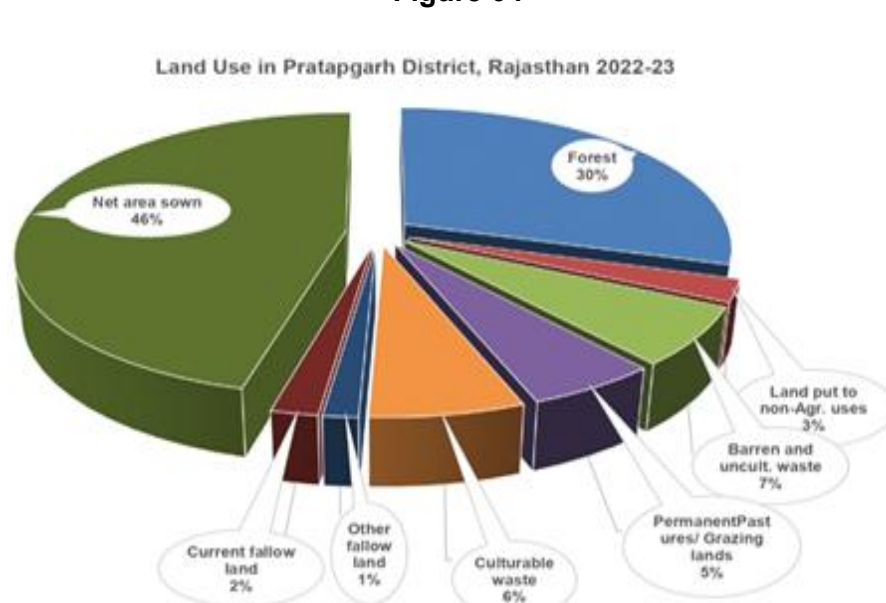
Forest: Total forest area in the district is 121132 ha. Of this 30.0 percent occur in Pratapgarh, 31.3 percent in Peepalkhoont, 18.6 percent in Dhariawad, 12.3 percent in Chhoti Sadri and 7.8 percent in Arnod tehsil. As per forest department statistics 2021, the forest cover is 1033.77 km² or 23.24 percent of district area. Of this moderately dense forest constitute 54.46 percent and open forest 45.54 percent. Scrub forest occupy 59.05 percent area. As per legal status the total forest area comes to 1666.99 km². Of this Reserved Forest comes to 42.15 percent, Protected Forest 57.81 and unclassified forest 0.04 percent respectively. Type of vegetation is dry deciduous. Important tree species are Teak, Salar (*Boswellia serrata*), Tendu (*Dyrosyros malonoxy*), Bad, Ficus (*Bellengalensis*), Peepal (*Ficus religiosa*), Neem (*Azadiracta indica*), Siras, Churail, Kachnar, Gulmohar, Amaltas, Bakain, Ashok, Mahua, Semal, Goondi, Khejri, Amla, Bamboo, Sindoor, Beil etc. Sitamata Wildlife Sanctuary located in the district was established in 1979 with an area of 422.95 km². Of this 22944.7 ha area falls in Pratapgarh, 4102.1 in Chhoti Sadri and 7826.0 ha in Dhariwad tehsils of Pratapgarh district and 7421.7 in Bari Sadri tehsil of Chittorgarh district. The Sanctuary covers 35960.3 ha reserved forest and 6334.2 ha protected forest of 13 revenue villages (Anon.2008).According to 2007 census there were 6882 wild animals.

Human Resources: As per 2011 Census the district was having a population of 867848 (Male 437744, Female 430104). Growth of population was 22.78 percent and density 191. Of total, Hindus were 95.33 percent, Muslim 2.05 percent and Jains 1.62 percent. Rural population constitute 91.73 percent and urban 8.27 percent (Anon. 2014). Total villages in the district are 1003 of which 39 are uninhabited. 423 villages in the district have no scheduled caste population. Main workers are 38.21 percent and marginal workers 18.91 percent. Occupation wise cultivators are 66.69 percent, agricultural labourers 20.73, household industries 0.85 percent and others 11.53 percent. SC population constitute 6.96 percent while ST population was 63.42 percent. Of the total ST population at tehsil level Dhariwad has 78.74 percent, Peepalkhoont 93.33 percent, Arnod 67.32 percent, Pratapgarh 45.06 percent and Chhoti Sadri 37.36 percent (Fig.1). The percentage of literate population varies from 43.69 percent in Dhariawad to 65.22 percent in Pratapgarh tehsil. Projected population of the district in 2023 is estimated to 1067700. Recently created three more CD Blocks are Dalot, Dhamotar and Suhagpura.

Livestock Population: Total livestock population of the district during 2019 was 1023911. This includes cattle 36.72 percent, buffaloes 20.17 percent, sheep 2.26 percent, goat 40.78 percent, pigs 0.11 percent and others 0.5 percent respectively (Anon.2022b). During 2012 the district was having 7.75 lac livestock and 1.38 lac poultry (Anon.2012).The percentage of cattle was 42.59, buffaloes 19.42 percent, sheep 2.83 percent, goat 33.54 percent pig 0.31 percent dogs 0.96 percent and elephant 0.21 percent respectively.

Land use and Agriculture: The district has 130046 land holdings comprising an area of 194990 ha. This include 17.12 percent marginal, 23.69 percent small, 28.99 percent semi-medium, 24.70 medium and 5.5 percent large holdings area (Anon. 2018). About 49.3 percent area of the district is under cultivation. This includes 14049 ha fallow land and 189505 ha net sown area as per agricultural statistics, 2022-23 (Anon. 2024). Area sown more than once comes to 41.47 percent of the total district area and 47.06 percent to gross cropped area. Forest is another important land cover system occupying 29.6 percent district area. Besides, land put to non-agricultural uses constitutes 2.6 percent, barren and uncultivable lands 6.64 percent, permanent pastures/grazing lands 5.45 percent, Misc. tree crops and groves .0.04 percent and culturable waste 6.39 percent respectively. The same are shown by pie diagram in Fig. 4 below. Marginal and small operational and holdings together constitute 77.12 percent of the total land holding in the district while their area is 40.81 percent. So far, the tehsil wise position is concerned, Peepalkhoont has highest area under forest while Arnod has lowest one; wasteland are more in Chhoti Sadri and lowest in Arnod; net sown area is highest in Pratapgarh and lowest in Dhariawad; and irrigated area is high in Pratapgarh and lowest in Peepalkhoont. Thus, Pratapgarh and Arnod tehsils are comparatively better in agriculture. Changes in land use has been worked out from agricultural statistics from 2008-09 to 2022-23 and shown in fig. 5 and table 1. During this period the area under forest, net sown area, total cropped area, double cropped area and irrigated area are increased by 1.13 percent, 11.45 percent, 34.33 percent, 74.82 percent and 106.12 percent respectively. On the other hand, the area under non-agricultural uses, barren and uncultivable land, culturable waste and fallow lands are declined by 5.37, 20.71, 29.86 and 48.04 percent respectively. No specific change has taken place in permanent pasture/grazing lands.

Figure 04



Irrigation: Irrigated area in the district is mainly concentrated in alluvial plains and valley fills. Thus, ground water is major source of irrigation. Out of 170729 ha gross irrigated area during 2022-23, 88.95 percent is from wells and tube-wells. There are 6146 tube-wells and 40601 open wells Canal irrigation just covers 5.54 percent. Net irrigated area is 166894 ha which brings irrigation intensity to 101.54 percent. Pratapgarh, Chhoti Sadri and Arnod tehsils possess 21 percent area each. Dhariawad and Peepalkhoont have 19.4 and 17.2 percent respectively. There is no irrigation facility in 251 villages in the district, highest being 86 in Pratapgarh tehsil.

Table 01: Trend in Agricultural Land Use in Pratapgarh district from 2008-09 to 2022-23 (Area in ha)

Year	Fallow Land	Net Sown Area	Gross Cropped Area	Gross Irrigated Area
2008-09	15782	173797	272020	82215
2009-10	16753	172596	267882	83215
2010-11	16338	174174	272423	85808
2011-12	14720	177186	283261	98106
2012-13	12424	178228	290681	107563
2013-14	10412	182998	305372	117270
2014-15	12080	182032	299170	116863
2015-16	12797	181782	295823	115660
2016-17	11344	184066	305396	120681
2017-18	10824	183530	306625	123130
2018-19	9992	185182	322037	136588
2019-20	9341	188435	336490	144919
2020-21	8852	189295	335856	142375
2021-22	8198	193700	365417	169959
2022-23	14049	189505	360629	170729
	48.05	11.45	34.33	106.72

Source: Agricultural Statistics, Rajasthan of concerned years

Cropping Pattern and Crop Production

Out of total 365417 ha gross cropped area in the district during 2022-23, wheat, maize, and soybean are emerged as most dominant crops grabbing 11.67, 27.14 and 39.26 percent area. Other important crops are gram (6.14 percent), mustard (4.86 percent), garlic (2.40 percent), linseed (1.75 percent), masur (lentil) 1.34 percent and groundnut 0.94 percent respectively. Cultivation of poppy (opium) is another significant crop being done under the supervision of Narcotics Control Bureau in 564 ha area. In 2023, 9171 farmers in the district have granted licence to grow this crop. Other crops of lesser significance are coriander and isabgol. The district achieved a total of 830191 tons crop production during 2022-23. Details of area and production of crops is given in table 2. The production of cereals was 60.57 percent, oilseeds 23.61 percent, condiments and spices 10.09 percent, and pulses 4.99 percent respectively. Fertilizer consumption in the district is just 40428 MT i.e. 2.2 percent of State. Similarly seed distribution of HYV (mainly wheat and barley) was also 1.97 percent of Rajasthan (Anon. 2024).

Gross District Domestic Production (GDDP)

The total estimated GDDP of the district for the year 2023-24 comes to 1372567 lac rupees (DES, 2024d). But the share of agriculture and allied sector is just 39.15 percent. Of this crops, livestock, forestry and fisheries contribute 22.78, 12.55, 16.50 and 0.50, percent respectively. Mining sector has negligible contribution. The per capita income (Rs.132969) is also low. Per capita agricultural output for 2020-21 estimated to Rs. 43871. Only 11.3 percent population is getting safe drinking water. Poverty ratio is above average (36.63 percent). About 63.3 percent population is under nutrition. The ranking of the district in economic infrastructure index comes to 23; social infrastructure 28; physical infrastructure 25; and overall infrastructure development index 27 (Chotila and Chauhan, 2014). The multi-dimensional poverty index (NFHS) as per Niti Aayog (2023) report comes to 52.33 percent for 2015-16 and 29.68 percent for 2019-21). This shows reduction in poverty rate. Further, the district is low performing in skill development initiation. 97 percent household have only cereals to eat, 2/3 have pulses and nearly half had milk. Water harvesting ponds in downstream are getting silted thus reducing storage capacity.

Table 02: Area and Production of Crops in Pratapgarh District during 2022-23

Crops	Area (ha.)	Percent	Production (MT)	Percent
Wheat	100856	27.97	406629	49.12
Barley	1572	0.44	5703	0.69
Maize	46793	12.98	97321	11.76
Rice	263	0.07	648	0.08
Others	23	0.00	0.00	0.00
Gram	22143	6.14	32714	3.95
Moong	3	0.00	1	0.00
Masur	4905	1.36	6595	0.80
Urad	1571	0.44	1269	0.15
Tooar (Arhar)	139	0.04	209	0.03
Others	580	0.16	874	0.11
Soybean (Glicine max.)	135919	37.69	165103	19.95
Sesame	145	0.04	53	0.00
Mustard	11829	3.28	19882	2.40
Groundnut	2430	0.67	5611	0.68
Taramira	15	0.00	8	0.00
Linseed	10622	2.95	12746	1.54
Cotton	1155	0.32	171	0.02
Methi	6151	01.71	9289	1.12
Garlic	7042	1.95	56336	6.81
Isabgol	887	0.25	787	0.10
Coriander	1273	0.35	1568	0.19
Cumin	30	0.00	14	0.00
Ajwain (Carom seeds)	454	0.13	658	0.08
Opium (<i>Papaver somniferum</i>)	759	0.21	0.00	0.00
Fruits & Vegetables	851	0.24	3530	0.42
Fodder crops	960	0.27	0.00	0.00
Other crops	1259	0.34	27	0.00
Total	360629	100.00	827746	100.00

Constraints

Natural Resources: 37.13 percent district area is occupied by hills and rocky/stony uplands is subject to severe water erosion and poor approach. In Pratapgarh district, dependency on ground water is a major concern. CGWB (2013) alarmed that there is no scope for further development in the district for irrigation or industrial use except in Peepalkhoont Block. In western part of Arnod and SW part of Chhoti Sadri, GW is not suitable for agriculture due to high concentration of nitrate. Basalt and gneisses are consolidated rocks where percolation rate is low. Most of the forest cover is open scrub. The fragmented small patches of forest pose hindrance in agricultural operations. Most of the rivers flow outside district area which restrict conservation and utilization of rain water.

Agriculture: Agriculture has been a relatively unrewarding profession due to crop failures, low productivity, unfavourable prices, and practically very little value addition (Anon. 2017). Little emphasis is given to pulse crops which hampers the food availability. Together with high livestock mortality, landlessness and inadequate credit facilities causing food insecurity, loss of livelihood, and ineffective and out migration. Limited access to inputs and resources making it difficult for small and marginal farmers to compete with large players in market. The cropping pattern is unbalanced. Least emphasis is given to pulse crops. Area under drip and sprinkler irrigation is very limited as also the cultivation of horticultural crops. Out migration badly hampers the agricultural operations and ultimately low production to sustain.

Condition of Farming Communities

Surprisingly, the tribal population in the district is 63.4 percent and in Peepalkhoont block has 93.3 percent ST population with only 35.8 percent literacy as per 2011 census. In backwardness, the district comes at 28 ranks in Rajasthan, 30th rank in SDG (Sustainable development goals) index and 569 rank in Human Development Index in India. From the study of Rajput et al. (2021), the ranking in the district in food unavailability comes to 17, food insecurity 23, inadequate consumption 5 and in food instability 24 respectively. The rank in food availability is 9 (high), food stability 10 (high), food accessibility 32 (low) and food security 10 (medium) respectively (Jatav et. el., 2022). Poverty and exploitation; economic and technological backwardness and socio-cultural handicaps are major causes of backwardness in this region. Others are illiteracy, poor education system; ill health and child mortality; poor and unassured water supply, worst condition of transport and communication; employment avenues and out migration. Tribal people have been victim of social, economic and religious discrimination and exploitation. Times of India (Oct. 21, 2023) found little progress in health, education, industrialization and tourism. In view of Singh and Sharma (2018), it is bare fact that the tribal area (Pratapgarh) have been deprived of the basic amenities and necessities. Therefore, people residing in this area remained economically as well as socially backward.

Others:

1. Socio-economic discrepancies between farmers and agri-business
2. Restricted market information/market constraints
3. Financial constraints and limited availability of inputs
4. Lack of Institutional Support
5. Adverse micro-economic conditions

Challenges:

1. Development of Industries, create employment avenues and training.
2. Poor production planning and market skill
3. Establishing a good supply network
4. Wide skill gap as per NSDC (2013).
5. Increase crop production, crop productivity and water use efficiency
6. Minimise food insecurity and ensure better access to food, arrest malnutrition among children and women's health care.
7. Climate change resilience for sustainable development of agricultural resources

Development Strategies

Important and viable development options are: Integrated farming system approaches involving optimal use of resources, quality seeds and value addition, nutrient management, integrated pest management, farm mechanisation, enhance fodder production, infrastructure facilities and improving/ expanding extension services. Reducing instability in agricultural production should be a major policy concern (Anon. 2019). To adopt integrated approach which focus on minimum use of external inputs, optimal use of internal resources, harness the benefits of irrigation, up gradation and management of tradition community irrigation system and climate risk management at the grassroots level. Other management and development practices are:

1. Adoption of agroforestry and Silvi pasture system. Niti Aayog under GROW programme (2024) has estimated 180.7 km² district area highly suitable for agroforestry and 30.44 km² moderately suitable.
2. Increase cultivation of pulse crops.
3. Promote fish farming and poultry.
4. Increase cultivation of remunerative horticultural crops, creation of storage facilities and food processing.
5. Enhanced and availability of quality seeds
6. Improving/ expanding extension services

7. Climate risk management the grassroots
8. Improving food security through asset creation
9. Technological advancement and suitable reformation of Govt. Policies for cultivation of opium (*Papaver somniferum*).
10. Creation of better supply network
11. Ensure quick flow of market information and Institutional support

Conclusion

Located within sub-humid southern plain and Aravalli hill Agro-climatic zone, Pratapgarh is a fully tribal district of southern Rajasthan. Its 73.6 percent area is drained out by rivers of Mahi River Basin and 22.02 percent by Chambal River basin. Hills and buried pediments are dominant landforms. Black loam soils occupy 57.4 percent area, clay loam 38.4 percent and red soils 4.2 percent. Arable lands under land Capability Class II and III together occupy 51.4 percent area. This indicate a little scope for expansion of agricultural land. Ground Water is major source of irrigation but over exploited with 128.5 percent stage of GW development. Jakham is the only large dam in the district besides 19 medium and small ones. But irrigated area from canals and tanks is just 5.5 percent. Forests though occupy 23.24 percent district area but most of them are scrub forest. The population of the district was 8.7 lacs with density of 191 and growth rate of 22.78 percent. 63.4 percent district population is Scheduled Tribe. Interestingly Peepalkhoont tehsil has 93.15 percent ST population. Cultivated area (including fallow) in the district is 49.33 percent. The extent of cultivated as well as irrigated area varies from year to year. Double cropped area is 41.5 percent. Arnod and Pratapgarh tehsils have large area under agriculture while Dhariawad tehsil has more area under wastelands. Since formation of the district the net sown area and net irrigated area are increased by 9.1 percent and 107.7 percent while the area under culturable waste has declined by 32.9 percent. The cropping pattern is highly imbalanced, leading to food insecurity and malnutrition. Area under pulses is just 8.14 percent and cereals (mainly wheat and maize) 41.45 percent. On the other hand, oilseed crops viz. soybean and mustard grab 44.63 percent area. Though total agricultural production has increased by 90.9 percent since 2008-09 but food availability remained very poor. The area is famous and rather suitable for poppy cultivation but Govt. policy and supervision system of enforcement agencies leading to poor performance of his crop.

Major constraints for agricultural development and improved livelihood condition of farmers are, limited arable lands; fragmented large forest areas making agricultural expansion and mining activities difficult, lack of rain and river waters harvesting structures; overexploited GW and low percolation rate; poor industrial development and mineral exploration and infrastructure development. Serious challenges are: expansion of cultivated land, shift to appropriate cropping system; harness and management of runoff, conversion of small fragmented forest land into agriculture, proper use of marginal land, enhance forest produce; and creation local material-based cottage industries. Important solutions could be: adoption of livestock based integrated farming system with optimal use of resources and internal inputs; adoption of agro-forestry, silvi-pasture and fish-culture; liberalization of opium cultivation policy; ensure availability of quality seed at proper time; enhance fodder production; infrastructure development; establish bare houses; integrated pest management and nutrient management.

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