

Appraisal of Agricultural Situation and Challenges in Sirohi District, Rajasthan

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Abstract

Livelihood and food security for agricultural dependant rural populations in arid and semi-arid regions of India, is at high risk due to over exploitation and degradation of natural resources and impact of climate change. In order to bring out the key factors for high food insecurity in Sirohi district of Rajasthan, the present status of natural resources and their level of degradation are assessed using relational multifaceted dataset. Long term land use, cropping pattern and crop production data are analysed. Over the period from 1957-58 to 2020-21 only marginal increase has been observed in net sown area. The acreage of cereal crops has greatly declined and more emphasis is given to irrigated and cash crops. Castor cultivation came up in a big way. A major portion of forest cover is under degraded state. Ground water is overexploited. Surface water resources are inadequate and undependable. Judicious use and management of soil and water resources and adoption of integrated livestock-based farming systems are key options towards agricultural development.

Key Words Land use, ground water, surface water, water erosion, degraded forest, food insecurity.

Introduction

Agriculture is and will always be most important sector in supporting livelihood of rural Indian population. In recent past burgeoning population and demand for land-based products led to overexploitation and misuse of natural resources. The impact of climate change has further aggravated the situation particularly in arid and semi-arid regions. Sirohi district located in south-western part of Rajasthan State is also subject to such constraints and challenges. A large part of the district is occupied by isolated and detached hills of Aravalli range creating moderate to severe water erosion. Its drainage is such that most of the runoff goes to adjoining districts of Rajasthan and Gujarat. There are only two medium irrigation bunds and no large reservoir. Net sown area is just 33%. In recent past the acreage of food crops has sharply declined. This caused adverse impact on food security. In view of above constraints, this study has been undertaken to examine the present agricultural situation in the district; the status as well as degradation level of natural resources; assess long term changes in agricultural land use and impact thereof both at district and tehsil level and came up with possible options for ensuring sustainable agricultural growth as well as restoring and improving the health of vital natural resources.

Study Area

Located towards south western part of Rajasthan State, Sirohi district is bounded in the north by Pali district, in the east by Udaipur district, Jalor district towards west and

in south by Banas Kantha and Sabar Kantha districts of Gujarat State. It stretches between 24° 19' 34.72" to 25° 17' 21.54" north latitude and 72° 13' 52.86" to 73° 10' 44.57" east longitudes covering an area of 5,139.1 Km² (Fig.1-left). Krishnan (1968) estimated (1968) 41 Km² area of the district under arid zone, 3976 Km² under semi-arid and 1160 Km² under sub-humid region.

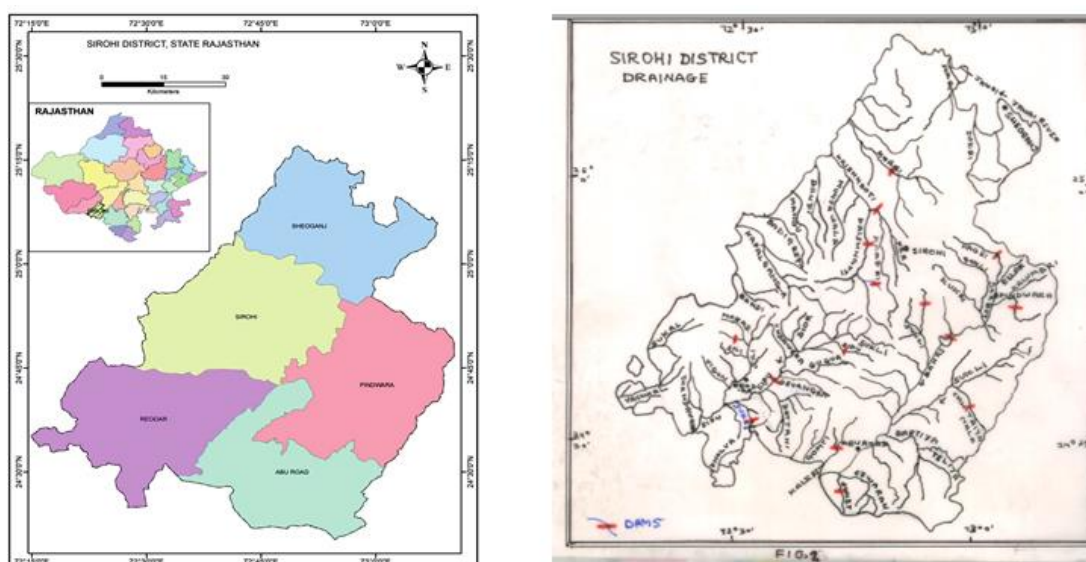


Fig. 1 (Left) Location Map of Sirohi District. (Right) Drainage map of Sirohi District.

Methods and Materials

In order to assess the present status of natural, human and livestock resources, recent data on climate, soils, vegetation, surface and ground water and mineral resources of the district are gathered from the reports of the respective departments viz. soil & water conservation, forest, mineral & geology, water resources, CGWB, irrigation etc. Survey of India toposheets on 1:50,000 scale is interpreted to prepare drainage map and location of water storage structures. Satellite images from Google Earth are interpreted to identify the degraded and problematic as well as potential areas. Tehsil level data on land use, irrigation, cropping pattern and crop production for the year 2020-21 are obtained from Land Records Office at District Collectorate and analysed. Other relational data at district level are obtained from Statistical Abstract 2020-21. Long term data from 1957-58 to 2020-21 on total cropped area, gross irrigated area and area under cereal crop are analysed to show the land use trend. Tehsil level land use changes are worked out in between 1980-81, 1992-93, 1996-97, 2009-10 and 2020-21. Findings of research work on important issues are considered for evaluation and planning. These are by Garhwal et al. (2013) on soil resources; GWD and EUSPP (2013) on hydrogeology; Balak Ram and Chauhan (2009) on land use; Gaur et al. (2022) on land degradation; CRIDA (2012) on agrl. contingency plan; Jatav et al. 2022, Rajput et al. 2021 and WFP, 2009 on food insecurity; Newar et al. 2017 and Singh et al. 2014 on agricultural development and Saxena et al. (2020) on insecurity amongst tribal community in the district

Results and Discussion

Biophysical Resource Base:

Physiography: A large part of the district is a vast semi-desert plain marked by isolated hills and chains of hillocks forming the eastern and south western extending Aravalli range in the

east. Detached hills of Aravalli range are situated in the south east of the district. Pediments are exposed all along the hill slopes and plane areas. Alluvial plain occur along banks of West Banas and its tributaries, Kapalganga, Khari and Krishanoti etc. Valley fills occur mainly along West Banas and Krishnaoti rivers. Sirohi Block is mainly covered by pediments and buried pediments. In general, these are scattered in entire region. Ravines occur in western margin of the district around Raipur, Haripura, Manpura, Rohua, Pithapur and Towa village and are associated with Sukal, Vagon and Thandawara rivers. Structured hills (Marvan) and linear ridges are also occurred in this part in association with ravines.

Drainage: Of the total district area 35.6% falls under West Banas River basin, 18.7% Sukli river basin, 41.2% Luni River basin, 3.2 % other nallah basin and 1.3% in Sabarmati River basin respectively. Thus, water from different river basin flow towards south, northwest and south west direction. Thus, Sirohi shed away its surface water to neighbour regions rather than getting from outside. So far 44 rivers/ nallah are identified and mapped in the district. These are shown in Fig. 1-right with important dams/ reservoirs

Geology: The Delhi Super- group of rocks occupy the Aravalli ranges in the eastern part of the district and also small chain of hills to the west of Mount Abu. Main rock types are phyllites, mica schist, limestone, marble, calc-silicate and quartzite. Malani igneous suits (MIS) rocks are exposed in the district particularly around Pindwara, Sirohi and Abu Road Blocks. Main litho-units of MIS are granites, rhyolites and tuffs (Sen and Nagori, 2016).M

Landforms: Denudational and structured hills and linear ridged forms major landform in Sirohi district. Buried pediments and pediments are other denudational landforms. Among fluvial the alluvial plane, valley fill and ravine are important.

Climate: Average annual PET is 1449 mm. (Rao et al, 2014). Mean relative humidity at mount Abu is 61% and other areas 47%. Wind speed is 2.9 m/s to 9.0 m/s. Temperature varies from 4.9 °C to 42.7 °C. Average humidity is 54.7% which varies from 14.1% to 78.6% (PHED, 2014). Average annual rainfall (1951-2017) comes to 556.7 mm and at Mount Abu 1677.0 mm. Number of rainy days are 24 for region as a whole but 53 at mount Abu. Frequency of drought comes to once in 3 years. Mean annual rainfall from 2006 -2016 comes to 645.85 mm with CV 44.63%. Average CV is 52.93%. In 2010 the rainfall was 931.7 mm. In 2021 monsoon the district received 29% less rainfall (592 mm) Mean annual rainfall at Mount Abu comes to 1147 mm, Abu Road tehsil 508.0 mm, Reodar 588.5 mm, Pindwara 572.0 mm, Sirohi 385 and Sheoganj 352 mm respectively. As per annual rainfall pattern from 1971 to 2018 the annual variation of rainfall is large and significant (Singh et al, 2019).

Soils: Soils of steeply sloping side are very shallow, dark brown in colour and gravelly sandy loam. Undulating pediments have coarse loamy soils while very gently sloping pediments have loamy skeletal soils. Nearly level plains occupy fine loamy soils. About 74.1% district area is occupied by sandy loam soils, 24.65% clay loam, 1.1% loam and 0.15% mixed black & red clay loam soils (Garhwal et al. 2013). Excessive slope, severe erosion, shallow depth and excessive calcareousness are major constraints. So far, the land capability of the soils is concerned, Class II and Class III occupy just 6.86% and 29.28 %. Class IV lands occur in 19.92% and Class VII 11.93% area (Fig.3-left). On the other hand, Class VIII lands are spread over 32.02% area (SRSAC, 2010).

Surface Water: Tahal Group (WRD, 2014) worked out 422.31 Mm³/year surface water inflow under 25% dependability level in 2010 while CWC (2016) estimated the availability of surface water to 764.48 MCFT or 21.647 MCM. This includes 249.5 MCFT in Reodar and 201.56 in

Abu Road tehsil. As per Water Resources Department of Rajasthan (2022), the district has 11 tanks with storage capacity of > 4.25 mcm. Location of these tanks are shown in Fig. 2-left. Their total storage capacity comes to 144.78 mcm. The present storage in 2022 was 108.07 mcm or 74.65%. There are 30 tanks of < 4.25 mcm storage capacity. Their total storage capacity comes to 56.01 mcm. Present storage in 2022 was 39.85 mcm or 71.15%. % Navatha et al. (2011) estimated 134 wetlands in the district comprising 11307 ha area. Among them seasonal rivers occupy 61.9%, reservoirs and lakes 30.07% and seasonal ponds 2.5% respectively.

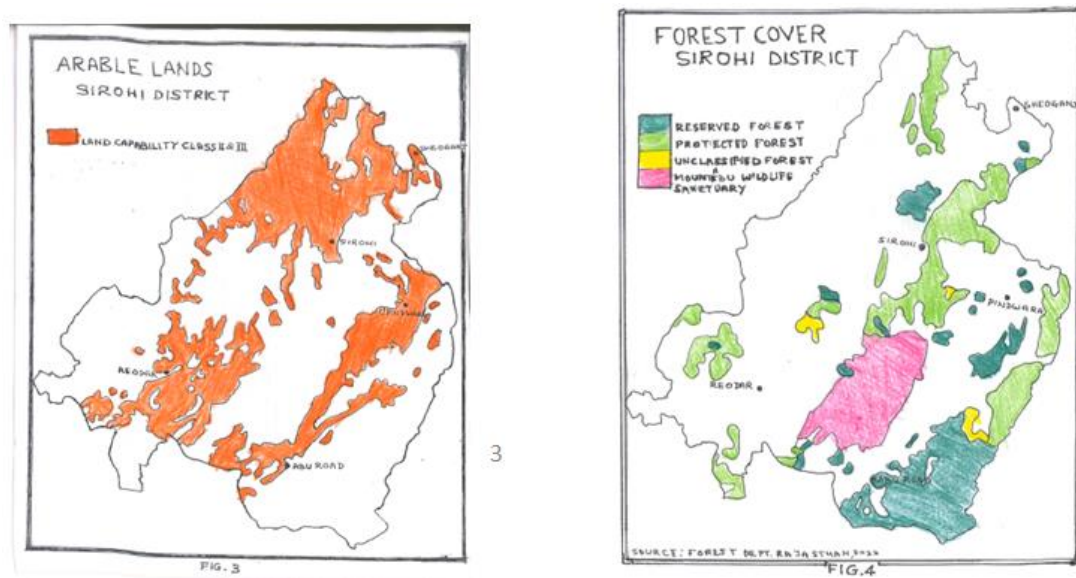


Fig. 2 (left) Arable lands in Sirohi District. (right) Forest cover in Sirohi District.

Ground Water: Tahal Group (WRD, 2014) in 2010 worked out 253.99 Mm³/year GW resources at 25% dependability level. As per CGWB (2022) assessment, the district has 247.03 mcm net annual ground water availability while the existing ground water extraction is 315.45 mcm. This brings the stage of ground water development to 127.7%. Block wise the stage of GW development comes to 124.02% in Abu Road, 74.32% in Pindwara, 186.74% in Reodar, 128.77% in Sheoganj and 110.72% in Sirohi respectively. Of total GW extraction 79% comes from overexploited and 21% from critical zones.

Vegetation: Dry deciduous plant species form dominant vegetative cover in the district. The vegetation above 1300 m gradually changes into sub-tropical broad-leaved forest (mainly over Mount Abu). Important species of this group are *Syzygium cumini*, *Magnifera indica*, *Crateva magma*, *Carvia callosa*, *Girardina zeylanica* and *Kydia colycina*. Among deciduous, *Boswellia serrata*, *Anogeisus pendula*, *Cassia fistula*, *Diospyros melanoxylon*, *Lannea coromandelica* and *Buchanania lanzan* are important. Among thorn forest *Acacia Senegal*, *Albizia amara*, *Mimosa hamate*, *Prosopis cineraria*, *Prosopis juliflora*, *Wrightia tinctoria* and *Flacourtia indica* are found (Reddy et al. 2009).

Forest Cover: The district has a forest cover of 164208 ha which includes 61404 ha (37.39%) reserved forest, 98543 ha (60.01%) protected forest and 4261 ha (2.60) unclassified forest (Forest Deptt. 2022). As per 2019 assessment of forest cover, the district has 30074 ha

moderate density forest, 61117 ha open forest and 22936 ha scrub forest (Forest Deptt. 2019). Mount Abu Wildlife Sanctuary is spread over an area of 32809.736 ha which includes 10396.735 ha reserved forest and 22213.240 ha protected forest (Fig. 2-right). Broad leaved forest occupies 153.8 Km² (3.0%) area in district, deciduous forest 701.2 Km² (15.4%) and thorn forest 135.5 Km² (2.8%). Scrub land constitutes 4.4% area (Reddy et al. 2009).

Human Resources: The total population of the district as per 2011 census was 1,036,346 (534231 males, 502115 females). Rural population constitute 79.87% and urban 20.13% with decadal growth of 21.76%. Sex ratio is 940/1000. Literacy rate among males is 69.08% and 39.73% among females. Revdar tehsil has lowest rate of literacy (47.89%). SC and ST populations are 19.47 and 28.22 percent respectively. Scheduled tribe constitute 32.07% of total rural population. Concentration of ST population is highest in Abu Road (75.4%) and Pindwara (47.98%) tehsils. Tribal women constitute half of the workforce among tribals. Work participation rate is 50.95% among males and 29.40% among females. Cultivators constitute 29.55%, agricultural labourers 23.30%, persons engaged in household industries 2.75% and others 44.90%. Main workers in the district are 50.23%, marginal workers 10.28% and non-workers 59.49% respectively (Anon. 2014a, 2014b).

Livestock: District has a total of 9.72 lakh livestock population in 2019. Of these cattle constitute 19.29%, buffalo 14.90%, sheep 30.32 and goat 34.22% respectively. In 2012 the total population was 9.01 lakh. Over this period sheep population has shown increasing trend while buffalo population has declined. Cattle population has marginally increased. Total availability of dry matter fodder in the district was 388100 MT while the requirement is of 1269200 MT. Hence there is a balance of - 881100 MT (NDDDB, 2016). Under sustainable livestock production index (SLPI) the district falls at 6th rank in State (Chand and Sirohi, 2012). Total milk production during 2013-14 was 205000 MT, highest being 103000 MT from buffaloes and 64000 MT from cattle (NDDDB, 2016). Per capita availability of milk was estimated to 521 gm/day.

Land Use: Agriculture is the most dominant land use system occupying 42.5% area in the district. Out of total reporting area of 517947 ha forest constitute 30.07%, land put to non-agricultural uses 4.99%, barren and unculturable land 14.31%, permanent pasture and other grazing land 6.42%, misc. tree crops and groves negligible, culturable waste land 1.76%, other fallow land 5.15%, current fallow 4.01%, net area sown 33.28% and area sown more than once 11.69% as per agricultural statistics 2020-21 (Anon. 2022). The average net sown area (2016-17 to 2020-21) comes to 32.19% and gross cropped area 43.48%. Tehsil wise distribution of land use is given in table 1 and their diagrammatically presentation in Fig. 3. Average size of operational land holding is 2.59 ha. Of the total land holdings, marginal holdings constitute 37.37% and small holding 25.17%. On the other hand, the area of marginal holdings is only 7.76% and that of small holdings 13.98% of the total area under land holdings.

Wastelands: About 28.79% district area is occupied by different categories of wasteland (DoLR and NRSC, 2019). Among them scrub lands constitute 15.16%, degraded forest 8.28%, barren rocky/stony waste 2.02% and gullied/ ravines 0.76% respectively.

Irrigation: Wells and tube-wells are major source of irrigation feeding 87% of gross irrigated area. During 2020-21 the gross and net irrigated area has been 139459 ha and 104057 ha respectively (Anon. 2022). Out of total 2095 tube-wells and 21745 wells in the region, 19468 wells are presently in use while 2277 are lying unused. The average gross irrigated area (2016-17 to 2020-21) comes to 123375 ha.

Table 1 Tehsil wise status of Land Use (%) in Sirohi District, 2020-21 (Source: Land Records Branch, District Collectorate, Sirohi).

Land Use Category	Sheoganj	Sirohi	Pindwara	Abu Road	Reodar	Dist. Total (ha)
Forest	12.80	12.58	26.45	37.64	10.53	155726
Land put to non-agrl. uses	20.69	24.83	23.94	13.46	17.08	25851
Barren & uncultivable land	14.14	30.14	26.12	9.75	19.85	74112
Pasture/grazing land	18.71	21.32	25.68	4.54	29.75	33256
Misc. Tree crops & groves	90.91	9.09	00	00	00	55
Culturable wasteland	16.27	45.01	14.75	11.29	12.58	9154
Other fallow land	20.61	42.00	6.90	4.10	18.89	26646
Current fallow	18.50	38.27	9.96	5.41	27.68	20781
Net area sown	21.25	22.53	18.02	8.30	29.90	172366
Total Cropped area	19.45	20.37	17.82	8.30	34.06	232918
Area sown more than once	14.30	14.24	17.26	8.28	45.92	60552
Total Geog. Area (ha)	17.28	22.70	21.93	17.07	21.02	517947
Net irrigated area	16.59	18.90	14.83	7.95	41.73	104057
Gross Irrigated Area	13.95	16.42	13.59	7.68	48.36	139459

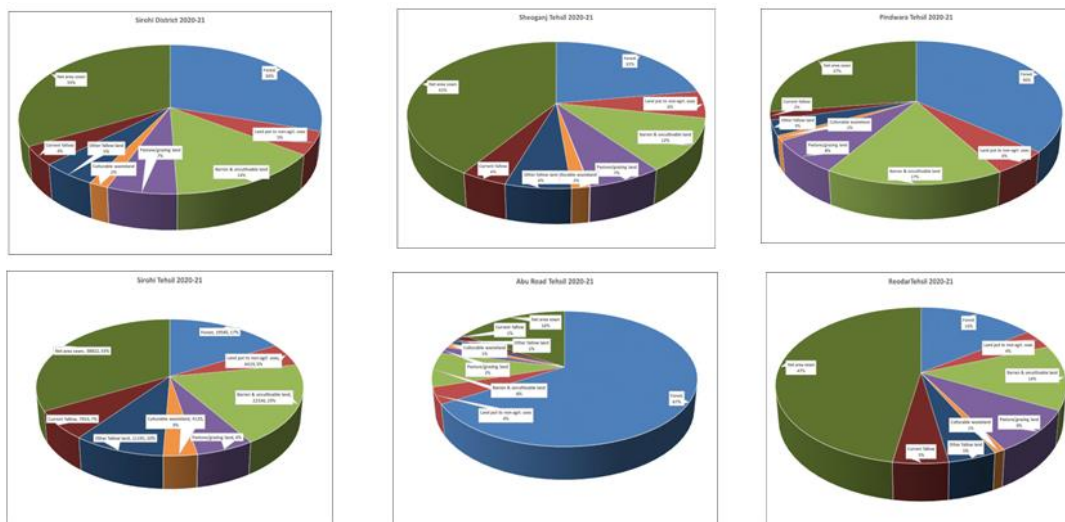


Fig. 3 Tehsil wise land use in Sirohi District (2020-21).

Cropping Pattern and Crop Production: The district where more than 70% rural population depend on agriculture, the area under cereal crops is just 32.35% of the total cropped area (232918 ha) as per agricultural statistics of 2020-21 (Anon. 2022). As such the production of cereal crops is 1.96 lakh tons only to feed 1.44 million population. Wheat, maize and bajra are important crops constituting 15.17%, 8.57% and 6.46% of total cropped area. On the

other side oilseed crops constitute 42.87% cropped area. Among them castor constitute 16.85%, groundnut 9.7%, sesame 9.56% and mustard 6.82 percent respectively. Pulse crops share 5.4% area. Among them moong, gram and urad are important. Guar, cumin, fennel and isabgol constitute 4.82%, 2.56%, 3.11% and 0.26%. Fodder crops occupied 5.98% area. Other insignificant crops of the region are jowar, barley, cowpea, fruits, and vegetables. Maize is most dominant crop in Pindwara and Abu Road tehsils; sesame in Sirohi; castor in Sheoganj and Revdar; and fennel in Abu Road and Sirohi tehsils.

Of the total crop production of 3.84 lakh metric tons in the district, cereals constitute 1.96 lakh (50.91%), pulses 2.29%, oilseeds 41.33% and condiments and spices 3.05 percent respectively. Wheat, castor, groundnut, maize and mustard are top ranking crops. The district thus falls under backward category in foodgrain productivity (Raghuvanshi et al. 2015). Details of area and production of crops is given in Table 2.

Table 2 Area (ha) and Production (MT) of Crops in Sirohi District (2020-21) (Source: Agricultural Statistics, Rajasthan 2020-21).

Crop	Area	Production	Crop	Area	Production
Jowar	2893	3112	Taramira	74	48
Bajra	14315	16549	Total Oilseeds	99583	158780
Maize	19953	45965	Chillies	165	99
Wheat	35340	124290	Cumin	5963	4280
Barley	1071	3746	Fennel	7241	7183
Other millets	1768	1927	Others	25	148
Total Cereals	75339	195589	Total Con. &	13394	11710
Moong	5261	2689	Cotton	2632	1217
Urad	3036	1931	Isabgol	602	335
Chaula	244	159	Guar seed	11231	7219
Gram	3745	3782	Fruits	1443	492
Other pulses	233	236	Vegetables	2121	NA
Total Pulses	12570	8797	Fodder crops	13927	NA
Groundnut	22603	56584	Other misc. crops	76	17
Castor	39233	70913	Grand Total	232918	384156
Sesame	21797	8740			
Mustard	15876	22495			

Change in land use, cropping system and crop production: During the last 63 years (1957-58 to 2020-21) the total cropped area in the district has increased by 60.78% and gross irrigated area by 267.0% while the acreage under cereal crops has declined by 6.99%. From 1980-81 to 2020-21 the district registered an increase in forest land by 8.89%, land put to non-agricultural uses 6.95%, barren and uncultivable land 212.71%, pasture/grazing land 0.13%, culturable waste land - 64.87%, other fallow 35.92%, current fallow - 42.2%, net sown area 20.43%, total cropped area 38.99% and double cropped area by 115.90% respectively (Anon.1992, 2017a, 2017b, 2018, 2019, 2020, 2022). This shows that net sown area has marginally increased and most of the culturable waste lands are came under barren and uncultivable land category. Net and gross irrigated area are increased by 96.48% and 107.58%. During the period from 1980-81 to 2020-21 the crop production has increased by 4.8 times or 383 %. The production of cereals has increased by 260.3%, pulses 61.7% and

oilseeds 192.4% respectively. The production of castor seed was just 182 MT in 1980-81 which jumped to 70913 MT in 2020-21. Irrigated crops attained major thrust while minor crops like cotton, rice, sugarcane, sunhemp etc. are almost disappeared.

In tehsil wise scenario, the net sown area has increased by 38.8% in Revdar and 33.1% in Sheoganj tehsil during 1980-81 and 2020-21. Sirohi and Abu Road tehsils recorded negligible increase. Total cropped area during above period has increased by 73.6% in Revdar and 41.75% in Sheoganj tehsil. Gross irrigated area has increased by 303.6% in Revdar and 44.7% in Sirohi tehsil. Least increase of 21.34% has been found in Sheoganj tehsil. Tehsil wise trend in net sown area, total cropped area and gross irrigated area during 1980-81, 1996-97, 2009-10 and 2021-22 are given in table 3. Trend in total cropped area, gross irrigated area and area under cereal crops during 1957-58 to 2019-20 is shown in Fig. 4.

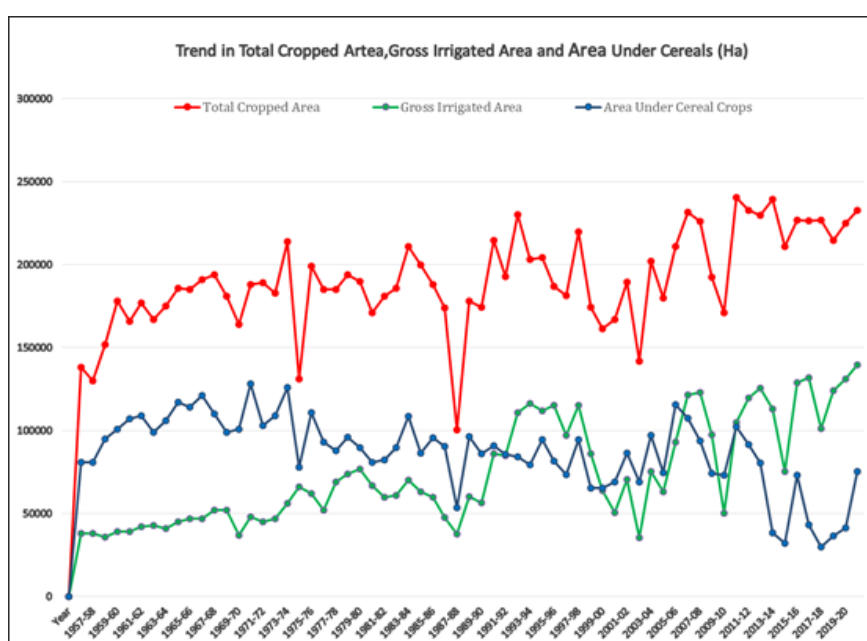


Fig. 4 Trend in total cropped area, gross irrigated area and area under cereal crops during 1957-58 to 2019-20.

Table 3 Tehsil wise trend in different land use parameters in Sirohi district (Area in ha) (Sources: 1. District Statistical outline of respective years 2. District Collectorate)

Land Use Category	Year	Sheoganj	Sirohi	Pindwara	Abu Road	Reodar	District total
Net area sown	1980-81	27525	37125	27510	13654	37110	143124
	1996-97	32306	30167	28549	13156	38698	142874
	2009-10	30335	28923	28478	14484	39684	141904
	2021-22	36632	38822	31063	14311	51538	172366
Total cropped area	1980-81	31951	41717	34279	17517	45706	171170
	1996-97	39134	31935	35316	17834	50789	182208
	2009-10	30334	28923	28478	14484	39685	191904
	2021-22	45292	47446	41513	19322	79345	232918
Gross irrigated area	1980-81	16029	15825	12100	6522	16712	67188
	1996-97	21984	21142	11727	6773	35384	97010
	2009-10	13345	17244	10339	6898	26206	74032
	2021-22	19449	22900	18949	10708	67453	139459

Food Security: Food security is an important aspect for livelihood of rural households. Sirohi district ranks 31 in food security index (Jatav et al. 2022.) since food availability and food accessibility are at low level. WFP (2012) too found the district in extremely insecure status. Similar findings are reported in Food Security Atlas of Rural Rajasthan (2009) when the ranking of district was 29 in the State. Per capita agricultural output is very low (Rs.582/annum) during 2002-03 to 2004-05. Average production was 1176.56 kg/ha and 1130.18 kg/ha during 2005-2010 (Kulshrestha et al. 2014). Newar and Sharma, (2017) worked out Composite Index of Agricultural Development. In 2010-11 the district falls at 19 ranks (intermediate district) in CIAD in Rajasthan. In rural backwardness, NFDB (2014) found the district at 18th position and concluded that the district is least vulnerable to climate change due to lower exposure sensitivity, crop production loss and high adaptive capacity.

Condition of tribal population:

For tribal population, crop-based livelihood form 50%, wages 14.16%, forest 11.94% and animal husbandry 8.61% respectively. The tribal agriculture is characterized by small land holdings, improper land utilization, poor farming techniques, low capital investment and low production inputs. Poor farming knowledge, illiteracy, insufficient capital & govt. aids are other basic constraints (Dagar and Upadhyay, 2022).

Degradation/ over-exploitation of Natural Resources and their Impact: Basically, the physiography of the district is not so favourable for developing agriculture. High relative closely spaced and steep sloppy hill ranges occupy nearly 32% district area are subject to moderate to severe water erosion and poor vegetative cover. Another 18 % rocky/gravelly uplands (pediments and buried pediments) too are highly degraded and of little economic use. About 25.28% district area is affected by water erosion as per land degradation statistics. Wasteland Atlas of India (2010) estimated 33.54% district area under wastelands. Surface water resources therefore, are poor and just share about 1.5 % of gross irrigated area. Runoff generated from river/nallah is not adequately harnessed and flow to adjoining areas. Arable lands are 36.14% and subject to water erosion. The stage of ground water development is 127.7%. This is highest (186.74%) in Reodar tehsil. Except Pindwara which is in semi-critical stage, all other tehsils are under over exploited condition. About 45% area is affected by moderate to high fluoride and 22% area with high fluoride in ground water. EC is high in north and western part. Actual vegetation cover just occur in 2.54% district area. So far, the health of forest is concerned, 301 Km² area is occupied with moderately dense forest while 597 Km² area under open forest and 248 Km² under scrub forest. With the growing population, there has been insignificant increase in net sown area and further decline in cereal crops. More emphasis given to cash crops. This led to food insecurity in the district. Little efforts are made to rehabilitate and develop degraded lands and gullied/ravinous land in particular.

Major Constraints:

- Dominancy of problematic and less potential hills and pediments.
- Widespread water erosion menace.
- Poor surface water and overexploited ground water resources
- Poor condition and ill management of water storage structures
- Degraded forest cover and poor forest produce.

- Little scope for expansion of agricultural lands
- Declining acreage of food crops
- Lack of traditional knowledge and local produce-based cottage industries and employment avenues.
- Neglect of common lands.
- Dominancy of economically, educationally and socially backward tribal community

Options and Management needs”

Increase acreage of cereal crops as well as production and productivity of rainfed lands; reduce fallow lands by taking more suitable crops; increase water productivity; proper storage, conservation, safeguard and utilization of rain water; identify potential lands for afforestation and regeneration of vegetation; rehabilitation and development of mine spoiled areas; increase more CD blocks and provide adequate rail/road connectivity; and control of child trafficking and out migration by creating adequate employment.

Conclusion

A major part of the district is occupied by moderate to steep slopping hills and pediments highly vulnerable to water erosion as well as also degraded forest leaving behind only 42% area for agricultural use. Average net sown area comes to 32.19% and gross cropped area 43.48%. Availability of surface water for drinking and irrigation, is highly uncertain. There are only 2 medium irrigation reservoirs. Drainage from the district contribute to Luni, West Banas, Sipu and Sukli river basins which led to flow out with untapped large volume of rain water. Ground water is over exploited all over the region with the stage of GW development to 124%. Higher fluoride and EC in GW is another problem. Over the last decades, there has been very poor increase in net sown area. On the other hand, the acreage of cereal crops has declined by 7%. More emphasis is now given to cash crops. Cultivation of castor seed came in a big way. This crop imbalance adversely affected food availability and putting the district at 31 rank in Rajasthan in food insecurity. Tangible impact of very good development plans for tribal population are not seen and they are badly struggling for livelihood, freedom from exploitation, child trafficking, bonded labour and other social stigma. Key development options are landscape restoration and adoption of soil and water conservation measures; adoption of agro-forestry and livestock based integrated farming and more viable food producing system; increasing water use efficiency and enhancing productivity through improved agronomic practices.

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