

Agricultural Intensity and Land Use of district Sultanpur (U.P.)

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Abstract:

The study of land use is considered a major geographical aspect for the development of food production, in which agricultural intensity is the most important factor. Under this, the frequency of crops produced in a particular area is studied. Agricultural intensity refers to the frequency of crops in an agricultural area, that is, the number of times a crop is produced in a given agricultural area in a year. This frequency of crops is called the agricultural intensity of that area. While the agricultural intensity index decreases with the decrease in the number of crops. There is an interdependent relationship between agricultural intensity and land use. The higher the total cropped area than the net sown area in a region, it shows the degree of agricultural intensity.

Keyword: There is an interdependent relationship between agricultural intensity and land use.

Geographical Introduction of the region: Sultanpur district is the southern district of Ayodhya division, which is located in the middle Ganga valley, and whose extension is located between 25059' north latitude to 26040' north latitude and 81032' east longitude to 8204' east longitude. Ayodhya, Ambedkar Nagar in the north, Pratapgarh and Jaunpur in the south, Azamgarh and Jaunpur in the east and Amethi and Barabanki districts in the west. According to the Surveyor General of India, its total geographical area is 4424 sq km and according to the figures of the Goods Department, its total area is 4436 sq km. 1.86% of the state's area (23,85,66 km) is located here.

Relief and structure: - From the point of view of relief, this district comes under the waterlogged area of Gomti, only the relief of the southern part is oriented towards the Sai river. Its surface is eroded in the Gomti river valley and due to excessive erosion of the lower valley of Gomti river, it has affected the water flow of the district. The general slope of the district is oriented from north-west to south-east. The Gomti river flows through the south-east part of the district and divides the district into two main parts. The geological history of Sultanpur district is formed from the deposits of the latest sediments of the Ganga-Yamuna plain. The depth of the deposit of its sediments is about five thousand feet. It has been formed in the Pleistocene geological age, mainly sand, clay and pebble deposits are found in the area of this district in the deposits of the Ganga plain. Groups of pebbles are found in the upper valley of the Gomti river. Reh is found in the areas of Bangar and Usar. The relative relief of the slope of the land in Sultanpur district is negligible. Gomti river divides the district into two unequal parts. In this division, most of the district lies to the south of the Gomti river. Light sandy soil is found in the narrow parts of the Gomti river. Bangar soil is found in the higher parts on both sides of the Gomti river. This shows the major

landforms of this district. In this way, this study area can be divided into three natural subdivisions. All these three parts are spread parallel to Gomti river.

- (A) Gomti Khadar area
- (B) Bangar plain
- (C) Lower Bangar region

Climate: Climate is the most important factor affecting agriculture directly or indirectly. Climatic characteristics also determine the population carrying capacity of a particular area, affecting the type of land use, its intensity and economic structure etc.

Temperature:- Sub-tropical climate is found in Sultanpur district. Due to the movement of south-east monsoon in the district, there is a change in the weather. The average annual temperature of the area is 23°C and the annual temperature difference is 12.80°C.

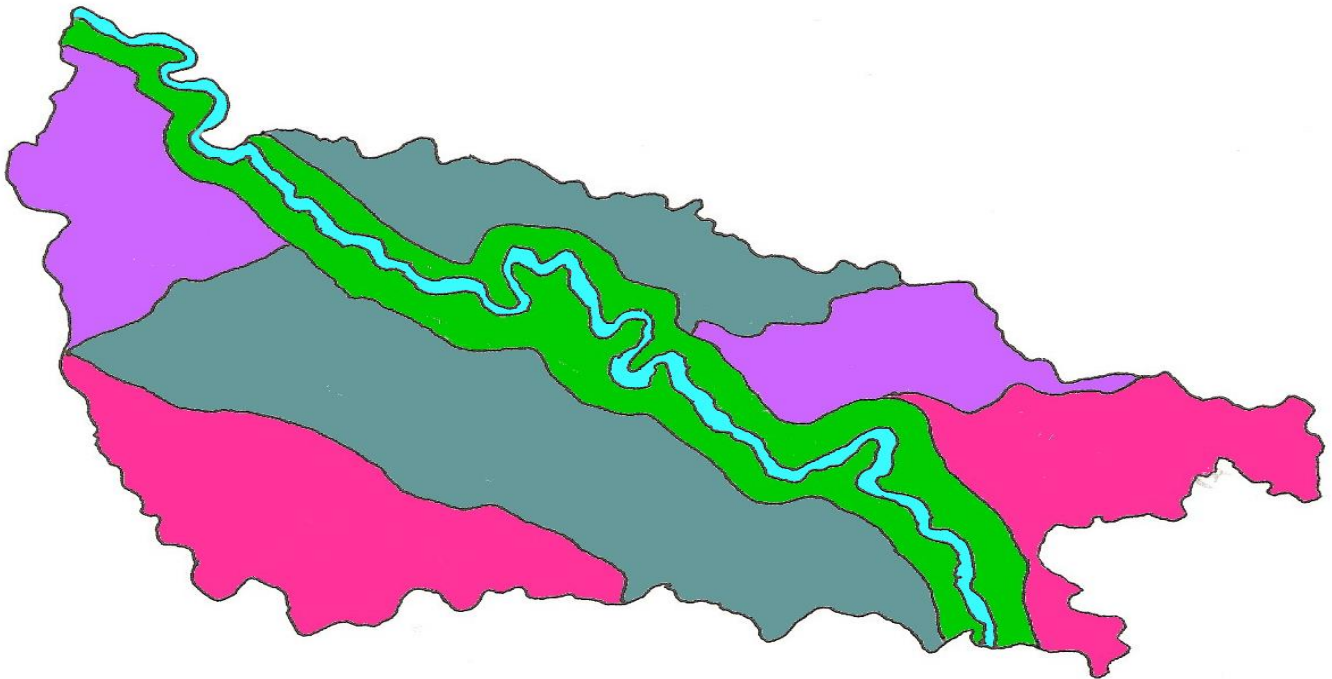
Climatic conditions of Sultanpur district year 2020

Month	Temperature °c			Monthly rainfall(incm)	Average relative humidity%	Air pressure (in mbar)	Wind velocity (km/h)
	Max	Min	Average				
January	23-2	8-5	22-3	4-8	84-2	1016-0	6-1
February	24-7	11-5	26-2	2-5	84-0	1013-8	7-9
March	33-5	16-5	32-6	4-0	76-5	1010-0	9-2
April	37-5	21-5	38-5	2-1	66-5	1001-0	10-2
May	40-7	25-6	40-8	1-2	35-0	1005-5	11-0
June	41-0	26-7	38-1	18-5	83-5	998-5	12-0
July	34-3	25-8	34-0	19-4	85-5	998-6	10-4
August	31-5	25-5	32-8	23-5	88--0	1001-0	8-6
September	31-3	23-5	30-4	45-1	88-2	1004-0	8-3
October	30-0	19-5	29-5	7-3	88-0	1010-0	5-4
November	27-8	13-6	26-0	2-8	83-0	1014-0	4-0
December	24-4	8-9	20-5	2-1	85-0	1016-8	4-1
Average	&	&	31-0	11-11	88-45	1007-4	8-1

Source- Meteorological Department of A N D University of Agriculture and Technology, Ayodhya.

Soils:- Sultanpur district is situated in the flat plains of Ganga-Yamuna. Matiar soil is found in this district which has high water holding capacity. Here mainly clay, loamy, brown and matiyar soils are found. On physical study, the soils of this district are divided into the following six parts -

1. Light brown sandy clay loam soil.
2. Light brown clay loam soil.
3. Brown light sandy soil.
4. Light brown fine grained sandy loam soil.
5. White brown sandy clay loam soil.



6. Brown fine grained sandy loam soil.

District Sultanpur (Soil Types)

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	Light brown sandy clay loam soil.
	Light brown clay loam soil.
	sandy clay loam soil.
	sandy clay soil.

Soils of Sultanpur district are the basic basis of agricultural economy and population concentration. Soil erosion is taking place here due to agricultural work done since ancient times, soft soil structure and water flow system and climate. Due to Gomti River and various drains found in the study area, most of the land is affected by soil erosion. It is known from the analysis that the government work is going on to prevent soil erosion and soil erosion, under which plantation of trees, construction of dams, reclamation of rugged land is going on. Leveling and arable barren land improvement programs are being executed.

General land use :- Land use is the result of a combination of natural and cultural resources, which keeps on changing according to the changing needs of human beings and the stages of agricultural development are marked indirectly in it. Many factors are responsible for changes in agricultural development stages, in which economic factors have a special contribution. Before the start of agricultural work, the entire land area is an invisible area, which is called land use of minimum return. Agriculture is an important traditional economic enterprise which supplies food grains to the entire population. It shows the soil culture realistically. Which Sultanpur district is an agricultural district, where 88.3 percent of the population is engaged in agriculture. Agriculture is the main means of their livelihood. Due to favorable geographical conditions, flat land, fertile soil, good climate, availability of water resources and increasing population pressure, agriculture is done on 64.67 percent of the total geographical area here.

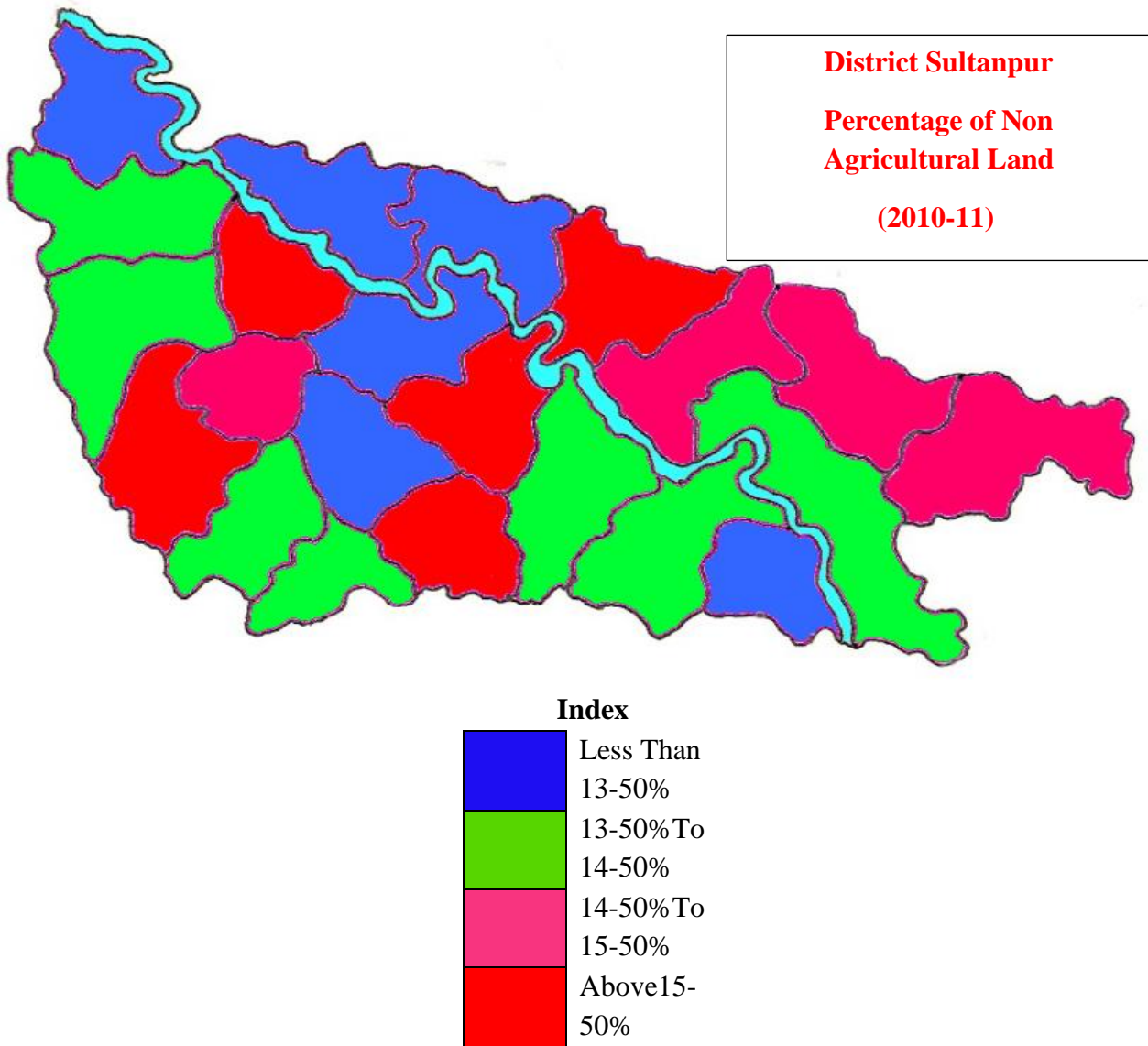
Agricultural land is important in the context of land use, in which the possibilities of future expansion in the cultivated area lie. In fact, on the basis of the distribution pattern of this type of land, the current and future land use profile of the study area is determined. Sultanpur district's 83.71 percent land is cultivable and 16.29 percent land is unfit for agriculture, which means the area under agriculture can be increased up to 83.71 percent. Maximum cultivable land is found in P.P.Kamaicha Block 85.26% followed by Kadipur 85.10%, A Valdirai (84.62%), Dhanpatganj (84.26%), Kudwar (84.10%), Lambhua (83.37%), Motigarapur (83.69%), Dostpur (82.84%). Akhand Nagar (82.84): is a development block.

“The net sown area is the most important aspect of land use, the different stages of its use are indicative of the level of social, economic and cultural development of human beings. In general, man always strives for the expansion of agricultural land by developing various facilities related to agriculture. Agriculture is done in an area of 284150 lakh hectares (64.67%) of Sultanpur district as compared to 409 hectares (24.25%) in urban areas. Agricultural land is dominated by 283741 hectares (64.79%) in rural areas. Maximum cultivated land is found in Baldirai development block (70.42%) and Lambhua development block (70.10%). Population pressure in this development block Land engaged in other uses. **Other than agriculture :-** Under the land engaged in works other than agriculture, it is unfit for agriculture due to the land used in railways, roadways, cemeteries, factories and various administrative works. It is called land. 52987 hectare land of Sultanpur district has been used for other works other than agriculture. Which is spread over 12.05 percent of the total geographical land here. The expansion of this land is on 32.68 percent of the land in urban areas while the expansion of non-agricultural land is found on 11.97 percent of the land in rural areas. Mainly land engaged in works other than agriculture is on 14.43 per cent in development block Jaisinghpur which is followed by Kurebhar (14.31), Kudwar (12.50), Bhadaiyan (12.47), Shahgarh (12.43). All these development blocks are located in the north-eastern part of the district. The least amount of land engaged in non-agricultural work is in the development block Kadipur (9.38%). Which is followed by Akhandnagar (9.60), Motigarapur (10.24), Baldirai (10.51), Pratappur Kamaicha (10.52), Dostpur (10.73), development blocks. There are regional variations in the distribution of land engaged in non-agricultural work in the remaining blocks (10.53:-12.05:).

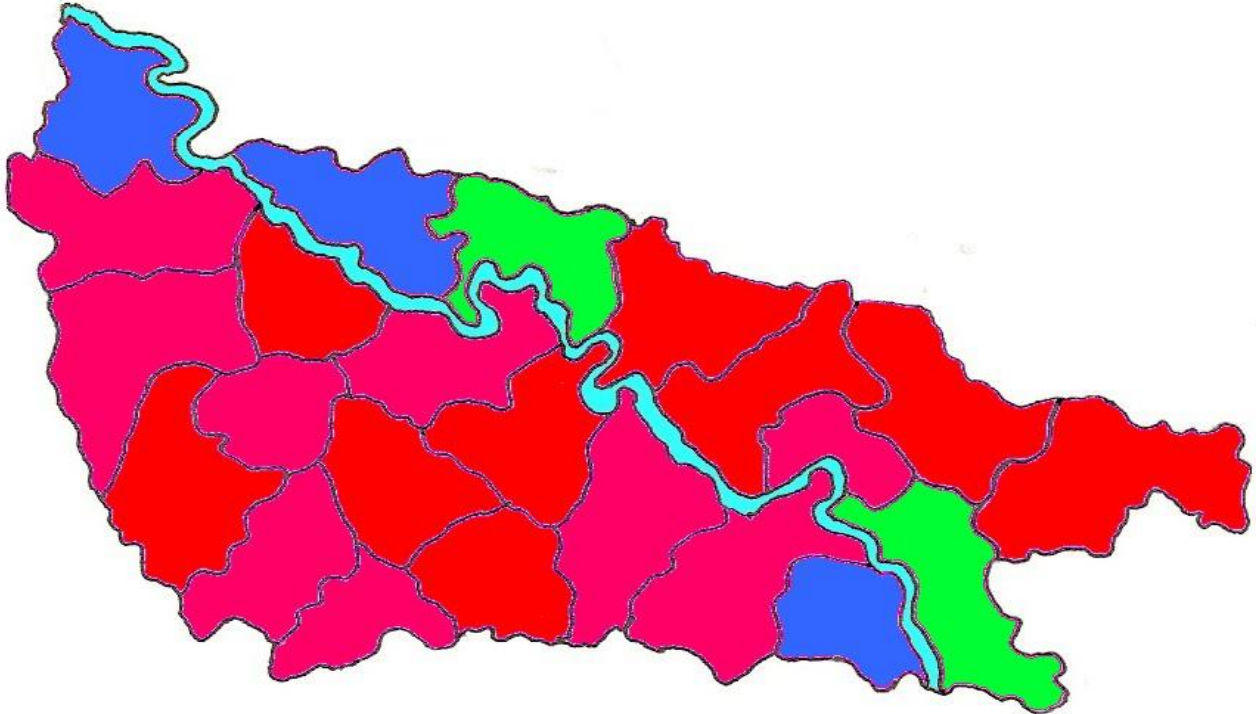
Due to being the highest person per square kilometer in the district, 82.04 percent of the cultivable land here, almost (90%) of the cultivable land has been converted into agriculture. High agricultural intensity has been found in Dostpur development block at 170 percent and in Motigarapur development block at 165.4 percent, as a result of which production per hectare has been increased here so that food grains can be supplied to the huge population here. It is clear from the analysis that Bhadar development block is the only part of the study area where agriculture is possible on 55.22 percent of the agricultural area and agriculture is being done in more than 60 percent of all other development blocks.

Land engaged in other uses other than agriculture:- Under the land engaged in works other than agriculture, land used in railways, roadways, cemeteries, factories and land used in various administrative works, it is called non-agricultural land. 52987 hectare land of Sultanpur district has been used for other works other than agriculture. Which is spread over 12.05 percent of the total geographical land here. The expansion of this land is on 32.68 percent of the land in urban areas while the expansion of non-agricultural land is found on 11.97 percent of the land in rural areas. Mainly land engaged in works other than agriculture is on 14.43 per cent in development block Jaisinghpur which is followed by Kurebhar (14.31), Kudwar (12.50), Bhadaiyan (12.47), Shahgarh (12.43). All these development blocks are located in the north-eastern part of the district.

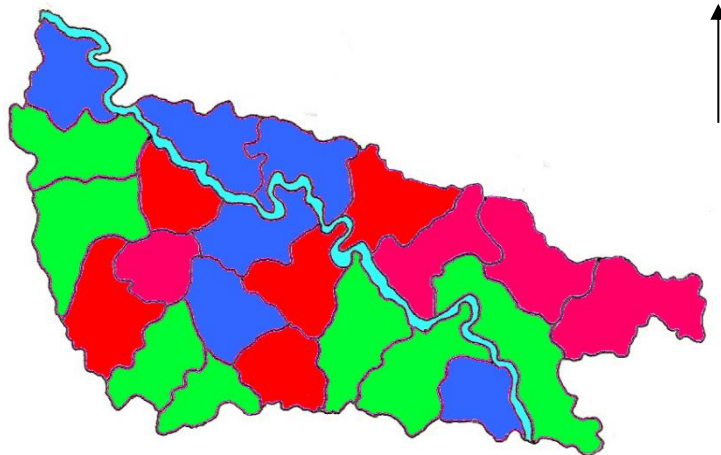
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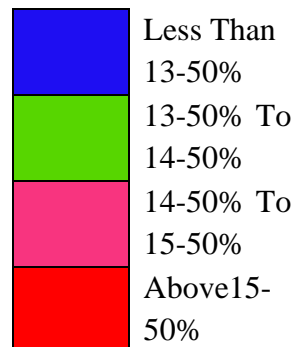
District Sultanpur
Percentage of Non Agricultural Land



(2020-21)



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Block-wise distribution of land use in Sultanpur district in percentage (2020-21)

Sr . No .	Developm ent block	Net sow n area	Fallo w land	Cultiva ble barren land	Garde ns and groves	Barren and uncultiva ble land	Pastu re land	othertha n agricultu re	Fore st land
1	Baldirai	64.80	12.60	3.45	2.53	3.01	0.49	9.90	4.44
2	Karaudi Kala	63.05	14.90	2.65	3.43	2.78	0.63	12.21	0.28
3	Kadipur	60.55	16.00	5.56	1.84	3.07	0.80	13.70	2.36
4	Lambhua	70.42	9-05	5-07	2-40	1-64	0-67	10-51	0-16
5	Pratappur Kamaicha	68.08	12-10	2-50	1-79	1-75	0-26	13-43	0-00
6	Dostpur	63.27	17-50	1-38	2-15	2-14	1-03	12-43	0-05
7	Akhandna gar	66.99	12-91	1-08	1-57	3-45	0-71	13-30	0-04
8	Jaisinghu r	67.34	11-90	1-47	3-43	2-24	0-62	12-83	0-05
9	Dhanpatga nj	61.76	13-60	2-11	4-32	4-71	1-27	12-17	0-07
10	Kurebhar	55.22	20-10	2-06	3-61	4-28	0-99	12-24	0-43
11	Kudwar	64.63	11-40	2-07	6-32	2-76	0-67	12-12	0-00
12	Dubeypur	60.98	20-57	2-77	0-84	3-49	0-32	10-99	0-10
13	Bhadaiya	60.65	19-00	1-88	0-49	2-23	0-31	14-31	0-64
14	Motigarpur	62.40	17-80	2-10	0-61	2-22	0-16	14-43	0-18
	Total District	64.67	15-03	2-34	1-67	3-25	0-54	12-05	0-45

Source- District Statistical Magazine Sultanpur (2020-2021).

Agricultural intensity is the most important factor under land use. Under which the frequency of crops produced in a particular area is studied, that is, how much weight is produced in a certain agricultural area in a crop year, this frequency of crops is called the agricultural intensity of that particular area. If only one crop is produced in a year in a particular area, then the agricultural intensity of that particular area will be considered as 100, if two crops are produced, then the agricultural intensity will be 200. Therefore, increasing the number of crops increases the agricultural intensity index, whereas decreasing the number of crops decreases the agricultural intensity index. There is an interdependent relationship between

agricultural intensity and land use. In any area, the total cultivated area is more than the net sown area, it shows the amount of agricultural intensity. The expansion of the amount of net sown area is controlled by innovative methods, chemicals, fertilizers, insecticides, latest agricultural mantras, barren land and technical improvement. In the study area, a large part of net sown area is affected by irrigation system or drought with limited rain tube wells. Therefore its full potential cannot be utilised. Agricultural intensity in Sultanpur district is determined by the use of irrigation means, fertilizers, innovative seeds and new agricultural machines etc. There is a proportional relationship between net sown area and gross cultivated area. The gross cultivated area being more than the sown area in the district is a sign of intensive agriculture. The intensification of the agricultural system is the temporal point where the combination of land, labor, capital and management is most beneficial. In this way, agricultural intensity is not only completely influenced by geographical conditions, social, economic and institutional factors, but is also determined. Its format depends on the arrangements, systems and methods which keep changing from time to time. Agricultural intensity is easier to calculate in areas where only one crop is grown in a year. If its crop is sown immediately after a crop. So it is difficult to know the depth of that area. Although many scholars have expressed their views regarding the estimation of agricultural intensity of such area, it is mainly related to the regional distribution of agricultural intensity. Tyagi V.S. (1972) used the term agricultural intensity in place of crop intensity. He has given three levels for its calculation.

- (1) To find out the percentage of the area occupied by various aspects of land use in the total geographical area.
- (2) To find out the percentage of occupied area under each crop out of the total cropped area.
- (3) To calculate the percentage of crops sown in Kharif and Rabi seasons out of net sown area.

Singh Jasveer (1974) has considered it appropriate to use the term land use efficiency in place of administrative intensity, in whose determination no fundamental difference is found. According to this, the more fertile and capable the land is, the more the frequency of crops on that land will be. In this way, land capacity and agricultural intensity are complementary to each other, therefore, the agricultural intensity of the district depends on the capacity of soil fertility, chemical fertilizers, irrigation, use of new agricultural equipment and technical knowledge etc. On the other hand, agricultural intensity depends on land ownership, tenancy practice, farm size etc. is affected. Thus the limits of land use capacity are determined by the conditions of the natural and human environment. Therefore, agricultural intensity can be defined as the amount of production of more than one crop in a year in the district. Singh B.B. (1979) has used the following formula to estimate the agricultural intensity, on the basis of which the agricultural intensity of the district has been determined.

Net Sown Area: In the study area, the highest agricultural intensity was found in Dostpur development block (170.3 percent) and on the contrary, minimum agricultural intensity was found in Baldirai development block (138.60 percent). Low agricultural intensity is found in the form of a long belt in the south-western part of the district. And in the central part of the district, the river Gomti flows from north-west to east-south. Light brown colored soil is found in the area near the river and Usar and Matiyar soil is found in the remote areas, as a result of which there is variation in the intensity of agriculture. A large part of net sown area in the district is affected by drought due to irrigation facilities and limited rainfall, so the land potential of the district cannot be fully utilised. Diversity is found in the regional form of

agricultural intensity. At the block level, the agricultural intensity of the district has been divided into three parts (low, medium, high) agricultural intensity.

(1) High Agricultural Intensity Zone:- (More than 160 percent):-The development block with more than 160 percent agricultural intensity has been included under the High Agricultural Intensity Zone, which is spread over 25.75 percent of the entire district. The highest agricultural intensity of 170.30 percent was found in Dostpur development block located in the north-eastern part of the district. Along with the means of irrigation, the population density has had a wide impact on the agriculture here. Apart from this, other high agricultural intensity development blocks of the district were found in Motigarpur (165.40%), Shahgarh (164.40%), Dubepur (161.90%) respectively. There has been a positive increase in irrigated land in these development blocks during the period 2015-2020. The average agricultural intensity of the high agricultural intensity of the district is 165.50 percent. The study of high agricultural intensity area of the district reveals that there is a positive correlation between irrigated intensity and agricultural intensity. Favorable physical and biological conditions for increasing agricultural intensity in the above development blocks-fertile soil, development of means of irrigation, due to the use of chemical fertilizers and improved seeds, higher agricultural intensity is found than the regional average.

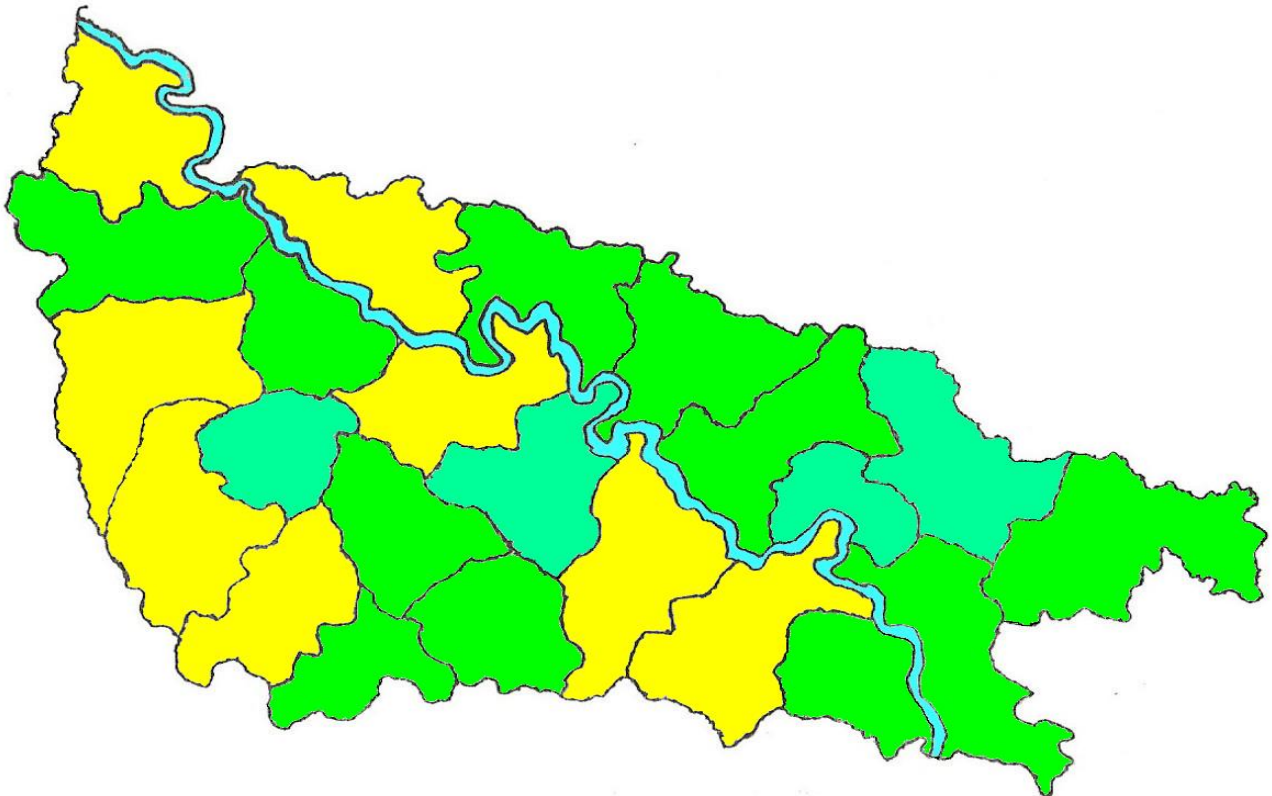
Medium Agricultural Intensity Zone (150-160): – The area between 150-160 percent of the district has been included under the medium agricultural intensity zone, which is spread over 65.25 percent of the district. Maximum medium agricultural jewel area was found in Akhand Nagar development block (158.80 percent) located in the north-east of the district. Apart from this, the agricultural intensity in development blocks is Musafirkhana (158.02%), Kurebhar (156.80%), Kadipur (156.50%), Bhetua (154.10%), Pratappur Kamaicha (151.60%), Jaisinghpur (150.90%), Dhanpatganj (150.90%), Bhadar (150.00%) was found. Gomti river flows in the central part of the district. As a result of uneven topography and pebble soil found on the banks of the river and nearby areas, obstacles arise in the use of agricultural land. The Gomti river flows through the boundary line of the above development block, therefore medium agricultural intensity is found in these development blocks. The average average agricultural intensity of the district is 153.51 percent. Medium agricultural intensity can be converted into high agricultural intensity area by using means of irrigation and chemical fertilizers, and advanced seeds in these development blocks.

Low agricultural intensity area (less than 150):- The area with less than 150 percent agricultural intensity in the district has been included under the low agricultural intensity area, which is spread over 25.20 percent of the district. The lowest agricultural intensity was found in the development block Baldirai (138.60 percent), besides it was found in other development blocks Kudwar (141.20 percent), Lambhua (148.70 percent). The expansion of unirrigated land is found more in these development blocks. By converting non-irrigated land into irrigated land, more possibilities of increasing agricultural productivity are reflected.

Agricultural Intensity in Percentage in Sultanpur District (2020-21)

S. No.	Block	Gross Sown Area in Ha	Net Sown Area in Ha	Agricultural Intensity %
1-	Baldirai	17592	12314	142-86
2-	Karaudi Kala	20379	13584	150-02

3-	Kadipur	16336	10320	158-30
4	Lambhua	21915	15810	138-60
5	Pratappur Kamaicha	23788	16065	148-10
6	Dostpur	13276	8073	164-40
7	Akhandnagar	20872	13941	149-70
8	Jaisinghpur	16328	10223	149-70
9	Dhanpatganj	15726	10205	154-10
10	Kurebhar	13194	8798	150-00
11	Kudwar	9892	6585	150-20
12	Dubeypur	20659	13694	150-90
13	Bhadaiya	21079	13439	156-80
14	Motigarapur	21247	14082	150-90
	Total District	445017	273810	152-60



District Sultanpur
Agricultural intensity
(2020-210)

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	Less than 150%
	150% To 160%
	Above 160%

Suggestions for increasing agricultural intensity in the district :- It is clear from the above study that agricultural intensity was found highest in Dostpur, Motigarapur, Shahgarh, Dubepur development blocks of Sultanpur district because electrification, mechanization, high irrigation system, fertile land, flat land in these development blocks. , use of chemical fertilizers, improvement of fertile soil, high pressure of high population etc. lead to high agricultural intensity.

1. The frequency of crops on the cultivated land of the district is increasing due to the conversion of one crop area into two or more crop areas and production of two crops in one crop period in the study area.
2. Small farmers in the sample district were found to be eager to grow summer vegetables, but due to lack of irrigation facilities, it is not being converted into reality, although this is not a problem in front of farmers with private tube wells, but due to the terror of Nilgai. Most of the farmers are not interested in doing vegetable farming.
3. Agricultural land should be balanced among landless farmers, because it is often seen in the study area that unbalanced distribution between land and farmers affects the nature and productivity of agricultural intensity, that is, balanced distribution of land increases agricultural intensity. And can prove helpful in increasing productivity.
4. Farmers who produce maximum crops in the study area should be honestly encouraged at public places and such farmers should be given cash prizes and facilities to visit India, so that farmers can become familiar with the agricultural technology of many areas, which will help in agriculture in the district. Intensity can be increased.
5. Usar land reform, agriculture loan scheme etc. programs should be implemented intensively in the district so that farmers can make proper use of the resources used in agriculture.

In addition to soil erosion, water development and flood prevention and social, cultural and economic problems, intensive and technical improvement in the land use pattern, irrigation, fertilizers, chemical fertilizers, pesticides and agriculture in order to solve the physical problems of Sultanpur district. The low agricultural intensity area of the district can be converted into high agricultural intensity area by the establishment of rural industry based on the raw material obtained at the level.

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