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## EXECUTIVE SUMMARY

Bulandshahr district is located between Ganga and Yamuna river, 60-65 kilometers from NCR with a population of about 35 lacs as per 2011 census. It is agriculture dominated district with immense potential for tourism as well.

Cereal crops dominate the district agriculture with Arhar, Mustard Oilseeds and Sugarcane and potato being the important crops in the district. There is abundance of organic manure due to rising livestock levels which bodes well for the organic farming. Scope also lies in the agro-processing sector. Proximity to NCR is further helpful. However, lack of marketing infrastructure and lack of skill deficit are some of the obstacles. Apart from the continuous changes, there is requirement for a project to be taken up for the awareness and skilling of farmers towards the organic farming and crop diversification.

There are several wetlands in Bulandshahr. however, they face high degree of pollution by the industrial, municipal and agricultural wastes. Fertilizer and pesticides are over used in the agricultural lands and toxic chemical pose a threat of bio magnification of toxicants. The cleaning of wetlands needs to undertaken on a project basis as non-maintained wetland also affects the aquatic life and possibilities of fisheries in the districts. Unsustainable fishing has caused the fragile ecosystem and huge damage. Thus, fishing during mating season should be limited by local authorities by balancing livelihood with some alternate means. To this end, algal and aquatic weed based biomass can be utilized for fertilizer development/ biofuels.

The tourism in Bulandshahr is a promising avenue for much needed employment and earning. As many as 20 Lakh tourists and pilgrims have graced Bulandshahr for various festivities in 2019. The number of domestic and foreign visitors in Bulandshahr increased continuously from the year 2016 to 2019. In the year 2020, the number of domestic as well as foreign visitors decreased several folds.. Khurja is popular for world class ceramic and pottery articles. A tourism circuit could be developed between Bulandshahr and Khurja.

For renewable energy, solar, biomass and biogas are the sources exploited in Bulandshahr. Major solar electrification heads have been under solar parks, roof-top on government buildings, cantonments, floating solar installations and some off grid items like solar lights, pumps etc.

# 1 DISTRICT OVERVIEW

## 1.1 INTRODUCTION<sup>1</sup>

The District of Bulandshahr is in Meerut region of western Uttar Pradesh located between Ganga and Yamuna rivers. The District is about 84 km in length and 62 km is breadth. The district is 237.44 meters above sea level.

The river ganga in the east separates this District from Moradabad and Badaun district and in the west river Yamuna separates the district from the State of Haryana and Delhi. In the north of district is Ghaziabad and in south east are the borders of Aligarh district.

The geographical area of the district is 4353 sq. km which is about 1.48 percent of the total Uttar Pradesh area. The urban area of the district is 122.8 sq. km and rural area as 4230.2 sq. km. This district is near to Delhi and is in national capital region. The nuclear atomic power plant is located at Narora town of the district. Near Sikandrabad town is located the national level satellite earth station. This is also an important grain producing agriculture District. Its proximity to the bustling markets of NCT provide it with unique growth opportunities.

The district gets its name from persianised version of “unchainagar” because of its height compared to surrounding plains. Bulandshahr takes pride in being part of first freedom struggle with the 9<sup>th</sup> Native Infantry. Babu Banarasi Das and Bhuvaneshwar Kumar are some of the notable people from the district.

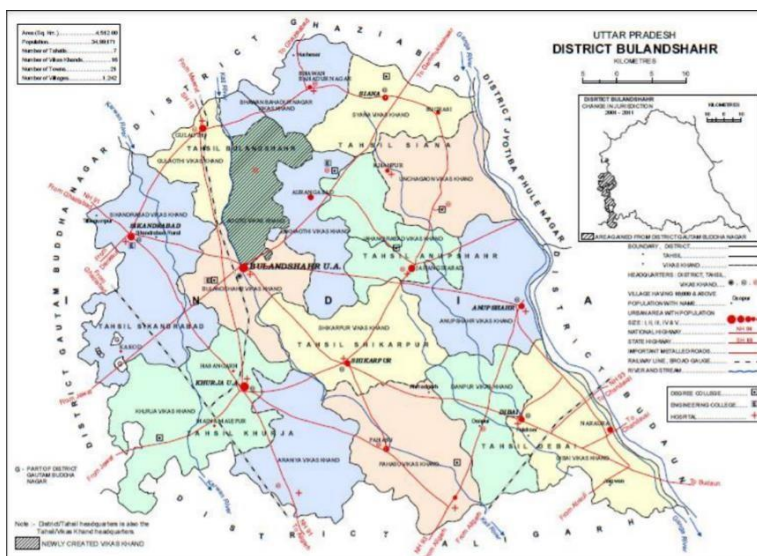


Figure 1 Map of the district-

<sup>1</sup> Bulandshahr District Profile  
<https://bulandshahr.nic.in/district-profile/>

## 1.2 DEMOGRAPHIC PROFILE OF BULANDSHAHR

As per the Census India 2011, Bulandshahr district has 587529 households, population of 3499171 of which 1845260 are males and 1653911 are females. Out of the total population, 75.21% of population lives in urban area and 24.79% lives in rural area.

Area	4353 sq. km
Density of population	776
Sex Ratio	896
Literacy Rate	80.9%
Working Population	11,73,260(33.5%)
Marginal Workers	2,88,044

*Table 1 demographic overview 2019-20*

The Schedule Caste population makes 20% of the total population (23% of rural and 13% of urban). The total working population is 11,73,260. Workforce participation rate is 33.5% (48% for males and 16.7% for females). There is a large urban population which has a lower workforce participation rate (29% vs rural 35%). Also a quarter of the workers are marginal (less than six months of work in a year).

	Cultivators	Agricultural laborers	Household Industrial workers	Other work
People(%)	28.3	20.6	5.6	45.5
Men (%)	30.9	19.3	3.5	46.4
Women(%)	20.1	24.6	12.6	42.7

*Table 2 Working population distribution 2019-20*

The district has 235 Bank offices. The credit to deposit ratio is 110.64 (UP: 58%). 43% of the households own a TV set compared to UP's 24%. These characteristics point to a typical middle income district.

## 1.3 AGRO CLIMATIC PROFILE OF THE DISTRICT

The general surface of the district present almost uniform level plain with an imperceptible gradual slope from north-west to south-east. The central portion forms an elevated plain flanked by low lying khadar strips on the banks of two rivers. The Ganga khadar in the east is narrower and these fertile deposits are regularly cultivated. The Yamuna khadar on the west is even more fertile and the tract of about 8 to 16 kms width is seen except in the south where the river flows to the eastern high bank. On the basis of geology, soil, topography, climate and natural vegetation, the district is divided into the following sub-micro-regions, Bulandshahr Plain and Ganga khaddar.



The principal rivers and streams of the district are Ganga and Yamuna, Kali, Karban and Nim. First two are perennial and rest are seasonal. Except for the occurrence of some depressions and usar lands (2.5%) here and there, particularly in parts of Sikandrabad, Khurja and Baran parganas, the entire plain is marked by large fertile tracts. The climate of the district is characterized by a cold winter, a hot summer and general dryness except during monsoon season. About 86 percent of the annual rainfall in the district is received during June to September, July and August being the rainiest months. The normal annual rainfall in the district. Some rains also occur in winter season from north-westerly cyclones which proves very useful to the standing rabi crops.

category	Number of Farmers (%)
<0.5 ha	44.6
0.5-1 ha	24.1
1-2 ha	18.2
2-4 ha	9.7
4-10 ha	3.3

**Table 3: Land holding pattern in 2011**  
*Source: District Statistical Handbook*

More than 68 % of the cultivators are marginal (less than 1 hectare of land). This number has slightly increased from 2001 figures since more land has been added to farming but even more number of cultivators own them.

The district does not have expanses of natural forests. The important trees found in the area are those of Shisham, Mango, Jamun, Imli and Babul. The district is rich in groves. The shrubs and bushes chiefly found in the district are those of Arua, Hina, Panwar, Madav, Karaunda and Makoh. These shrubs and bushes provide useful grazing ground for cattle.

## 1.4 ECONOMIC PROFILE OF BULANDSHAHR

Bulandshahr is a middle income district with per capita net income as per the year 2015-16 being Rs. 46,135; the Gross District Domestic Product is Rs. 24,829.07 Cr at current prices. The district Bulandshahr is very advanced in respect of industrial activities. Several hundred factories of pottery are working in Khurja city and its products are famous throughout the nation.

District has several large and medium scale industries which mainly include sugar mill, distillery, paper mill, spinning mill synthetic yarn, detergent powder and cake, vegetable ghee, refined oil, L.P.G. cylinder, tiles and Engineering goods. Government of India is issuing new licenses in order to encourage the industrial development in the district Small scale industries mainly manufacture agricultural tools, engineering workshop, nut bolts, brass metal, hand-pump parts, steel almirahs and furniture, steel pipes, rolling mills, electrical steel equipment, ice factory, flour mill, PVC, paints and chemicals, readymade garments and power loom. There are some units in the district, which manufacture transformers and supply them to State Electricity Board. Pottery industries mainly manufacture crockery, sanitary ware, scientific goods, electrical goods etc. To develop the pottery industry of Khurja Government of India has made arrangement for testing of raw material

for glass and ceramic. The government also provide knowledge about new and latest technologies and designs.

Trade in the district is mostly agricultural in character. Gram and cotton are the agricultural exports. Important manufactures were the cotton prints of Jahangirabad the muslins of Sikandrabad, pottery of Khurja and wood-carvings of Bulandshahr and Shikarpur. Among articles imported were foreign cloth, salt, iron and spices and other articles required by district people.



**Figure 2: Khurja: The pottery capital of India**

Markets dealing in general merchandise and cloth are located at all the urban centers, which also feed smaller markets called hats and bazaars. These bazaars are held once or twice on fixed days in a week and supply the villagers with food grains, oil seeds, cloth, vegetables and other consumer goods. Recent efforts under PM-Saubhagya (Electrification) bore fruit, as Bulandshahr has been electrified 100% by 2019 March. Under PM Gram Sadak Yojana most of the slated works here stand completed.

### 1.4.1 The District Economy

The primary sector has significant contribution to the district economy, though its share went down from 38.79% in 2011-12 to 32.71 in 2018-19. On average, it grew at the rate of 3.27% annually. The share of secondary sector also increased from 23.28% in 2011-12 to 28.09% in 2018-19, with an annual growth of 8.81%.. The tertiary sector’s share went up from 37.98% to 39.20% during the same period, with an annual growth rate of 6.33%. Overall, the district economy grew at the rate of 5.81 percent per year during the period. The data show that the all the three sectors drive the district economy. However, the secondary sector contributes more to the growth of the economy.

**Table 1: Trends in Gross District Domestic product in Bulandshahr at Constant Prices (base 2011-12) in Rs Crore**

Year	Sector-wise GDDP (Rs, Crore)	Annual Growth Rates
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ARTH GANGA: DISTRICT BULANDSHAHR

	Primary	Secondary	Tertiary	Total GDDP	Primary	Secondary	Tertiary	Total
2011-12	5839.88	3505.15	5708.32	15053.35	-	-	-	-
	(38.79)	(23.28)	(37.92)	(100)				
2012-13	6060.48	3874.41	5795.90	15730.79	3.78	10.53	1.53	4.50
	(38.53)	(24.63)	(36.84)	(100)				
2013-14	6397.40	4256.71	6349.20	17003.31	5.56	9.87	9.55	8.09
	(37.62)	(25.03)	(37.34)	(100)				
2014-15	6312.63	4688.89	6911.52	17913.04	-1.33	10.15	8.86	5.35
	(35.24)	(26.18)	(38.58)	(100)				
2015-16	6504.25	4886.29	7328.87	18719.41	3.04	4.21	6.04	4.50
	(34.75)	(26.10)	(39.15)	(100)				
2016-17	6770.47	5256.71	7662.28	19689.46	4.09	7.58	4.55	5.18
	(34.39)	(26.70)	(38.92)	(100)				
2017-18	7103.68	6263.36	8045.84	21412.88	4.92	19.15	5.01	8.75
	(33.17)	(29.25)	(37.57)	(100)				
2018-19	7303.44	6273.27	8754.11	22330.81	2.81	0.16	8.80	4.29
	(32.71)	(28.09)	(39.20)	(100)				
Average Growth Rate					3.27	8.81	6.33	5.81

Source: UPDES

Note: Figures in Parentheses are percentage share in the total GDDP

Since our focus is on agriculture and allied activities, we further disintegrate the primary sector GDP to know which sub-sector is laggard and which one is driving the growth of the primary sector. Table 2 shows agriculture, including horticulture, increased by 2.42 percent per year during 2011-12 to 2018-19 and its share went down from 48.99% in 2011-12 to 45.95% during the period. Contrary to this, the share of livestock rose from 47.35% to 49.19% during the same period, with annual growth rate of 3.84%. Share of forestry and logging increased from 3.58% to 4.46% during the same period, with an annual average growth rate of 9.46%.

Though Fishery has a negligible share in the total GDP of agriculture and allied sectors, it is the highest growing sub-sector in the district economy as it grew at the rate of 48.227% per year. Its share went up from 0.08% in 2011-12 to 0.40 percent 2018-19. Thus, livestock, forestry & logging and Fishery (allied activities) are the growth drivers of the agriculture and allied sector.



Mining & Quarrying also recorded a remarkable yearly growth of 16.49 percent. It is significant to note that livestock sector contributes more than the crop and horticulture to the agriculture and allied activities and can be the growth driver of the local economy.

**Table 2: Trends in Gross District Domestic product from Agriculture and allied activities in Bulandshahr at Constant Prices (base 2011-12) in Rs. Crore**

Year	Agriculture	Livestock	Forestry and Logging	Fishery and Aquaculture	Total Agriculture and allied	Mining and Quarrying	PRIMARY SECTOR
2011-12	2829.35	2734.68	206.92	4.90	5775.85	64.03	5839.88
	(48.99)	(47.35)	(3.58)	(0.08)	(100)		
	-	-	-	-	-	-	-
2012-13	3019.15	2784.10	181.63	5.13	5990	70.48	6060.48
	(50.40)	(46.48)	(3.03)	(0.09)	(100)		
	[6.71]	[1.81]	[-12.22]	[4.70]	[3.71]	[10.07]	[3.78]
2013-14	3254.25	2896.26	163.09	5.29	6318.90	78.51	6397.40
	(51.50)	(45.83)	(2.58)	(0.08)	(100)		
	[7.79]	[4.03]	[-10.20]	[3.17]	[5.49]	[11.39]	[5.56]
2014-15	2995.73	3082.34	162.09	5.66	6245.82	66.81	6312.63
	(47.96)	(49.35)	(2.60)	(0.09)	(100)		
	[-7.94]	[6.42]	[-0.62]	[6.96]	[-1.16]	[-14.89]	[-1.33]
2015-16	3145.54	2996.39	275.21	5.78	6422.91	81.34	6504.25
	(48.97)	(46.65)	(4.28)	(0.09)	(100)		
	[5.00]	[-2.79]	[69.79]	[2.07]	[2.84]	[21.74]	[3.04]
2016-17	3081.19	3227.60	307.14	7.07	6623.00	147.47	6770.47
	(46.52)	(48.73)	(4.64)	(0.11)	(100)		
	[-2.05]	[7.72]	[11.60]	[22.37]	[3.12]	[81.30]	[4.09]
2017-18	3210.75	3370.63	263.32	7.32	6852.02	251.67	7103.68
	(46.86)	(49.19)	(3.84)	(0.11)	(100)		
	[4.20]	[4.43]	[-14.27]	[3.61]	[3.46]	[70.66]	[4.92]
2018-19	3315.38	3548.99	321.64	28.90	7214.91	88.53	7303.44
	(45.95)	(49.19)	(4.46)	(0.40)	(100)		
	[3.26]	[5.29]	[22.15]	[294.66]	[5.30]	[-64.82]	[2.81]
Average Growth Rate	2.42	3.84	9.46	48.22	3.25	16.49	3.27

Source: Compile from UPDES

Note: 1. Figures in ( ) are percentage share in the total agriculture & allied GDDP

2. Figures in [ ] are annual growth rates.

Table 3 demonstrates the percentage share of sub-sectors within the secondary and tertiary sectors. Within the secondary sector, manufacturing had about 56% share in the secondary sector in 2018-19. Its share shows variability across years and on average increased during the period. The share of construction, though quite high, shows deceleration over the period. Its share went down from 50.05% in 2011-12 to 40.40% in 2018-19. The share of electricity, gas and water supply increased from 2.86% to 3.69% during the same period. Thus, manufacturing and electricity, gas and water supply are the major contributors to the growth of the secondary sector.

Within the tertiary sector, trade& hotels constituted the highest share (32.16%) in 2018-19, followed by real estate and professional services (25.85%), transport, storage and communication (12.90%). These three sub-sectors together constitute about 71% of the tertiary sector GDP. Average annual growth rate is observed highest in other services (9.25%), followed by transport, storage and communication (8.85%) and public administration (8%) and lowest in real estates.

Year	Manufacturing	Electricity, Gas, Water Supply	Construction	SECONDARY SECTOR	Transport, Storage & Communication	Trade and Hotel & Restaurant	Financial Services	Real Estate and Professional Services	Public Administration	Other Services	TERTIARY SECTOR
2011-12	47.09	2.86	50.05	100	11.09	32.69	6.75	28.46	10.37	10.63	100
2012-13	50.67	2.80	46.54	100	11.97	32.74	7.43	29.85	10.36	7.66	100
2013-14	51.65	2.91	45.45	100	11.75	33.63	7.04	28.39	11.48	7.71	100
2014-15	55.01	2.73	42.26	100	12.61	34.83	6.86	27.39	8.90	9.41	100
2015-16	53.53	3.77	42.71	100	14.40	33.54	7.03	26.48	8.67	9.87	100
2016-17	56.13	3.78	40.09	100	13.71	33.07	6.73	26.21	9.76	10.53	100
2017-18	58.98	3.59	37.43	100	13.33	32.28	5.75	26.72	10.66	11.27	100
2018-19	55.91	3.69	40.40	100	12.90	32.16	6.28	25.85	11.08	11.74	100
Average Growth Rate	11.80	13.37	5.45	8.81	8.85	6.15	5.56	4.85	8.00	9.25	6.33

Source: Compiled from district statistical handbooks

## 2 QUANTITATIVE DATA ANALYSIS

The Bulandshahr District is in Meerut region of Western Uttar Pradesh located between Ganga and Yamuna rivers. The general surface of the district present almost uniform level plain with an imperceptible gradual slope from north-west to south-east. The central portion forms an elevated plain flanked by low lying khadar strips on the banks of two rivers. The Ganga khadar in the east is narrower and these fertile deposits are regularly cultivated. The Yamuna khadar on the west is even more fertile and the tract of about 8 to 16 kms width is seen except in the south where the river flows to the eastern high bank. On the basis of geology, soil, topography, climate and natural vegetation, the district is divided into the following sub-micro-regions, Bulandshahr Plain and Ganga khaddar. The principal rivers and streams of the district are Ganga and Yamuna, Kali, Karban and Nim. First two are perennial and rest are seasonal. Except for the occurrence of some depressions and usar lands (2.5%) here and there, particularly in parts of Sikandrabad, Khurja and Baran parganas, the entire plain is marked by large fertile tracts. The climate of the district is characterized by a cold winter, a hot summer and general dryness except during monsoon season. About 86 percent of the annual rainfall in the district is received during June to September, July and August being the rainiest months. The normal annual rainfall in the district. Some rains also occur in winter season from north-westerly cyclones which proves very useful to the standing rabi crops. The total reported area of the district is 3694.74 sq km. Area under forest is only 2.29%. The share of cultivable wasteland declined from 1.26% in 2011-12 to 0.89% in 2017-18. The share of barren and uncultivable land has declined from 1.72% in 2011-12 to 1.27% in 2017-18. Areas under trees and gardens is almost zero. Fallow land shows marginal decline during the period. The net sown area shows no much change during the period. It ranges from 80.68% to 81.31. Contrary to this, area under non-agricultural uses has constantly gone up from 11.04% to 11.90% during the period. Overall, the land-use pattern does not show much visible change during the last nine years.

Bulandshahr is a middle-income district where many workers are employed outside of agriculture when compared to the rest of UP. The secondary and tertiary sectors account for more than 70% of Net Income.

Agriculture, Forestry and Fishing NDP	
Bulandshahr (37% of District)	10742.40
UP	316276.28
Bulandshahr : UP	0.03

Secondary NDP	
Bulandshahr (25% of District)	7146.92
UP	338277.16
Bulandshahr : UP	0.02

Tertiary NDP	
Bulandshahr (47% of District)	10772.85
UP	608407.19
Bulandshahr : UP	0.02

**Table 4: NDDP sector wise 2019**  
 Source Directorate of Statistics and Economics UP

## 2.1 AGRICULTURE AND ALLIED ACTIVITIES

### 2.1.1 Trend in Land Use Pattern

The total reported area of the district is 3694.74 sq km. Area under forest is only 2.29%. The share of cultivable wasteland declined from 1.26% in 2011-12 to 0.89% in 2017-18. The share of barren and uncultivable land has declined from 1.72% in 2011-12 to 1.27% in 2017-18. Areas under trees and gardens is almost zero. Fallow land shows marginal decline during the period. The net sown area shows no much change during the period. It ranges from 80.68% to 81.31. Contrary to this, area under non-agricultural uses has constantly gone up from 11.04% to 11.90% during the period (Table 4). Overall, the land-use pattern does not show much visible change during the last nine years.

**Table 4: Trends in Land-use Pattern in Bulandshahr (as % of total reported area)**

Year	Total Reported Area (ha)	Area under forest	Cultivable wasteland	Current Fallow	Other Fallow	Barren and uncultivable land	Land other than agriculture	Pastureland	Area under trees and gardens	Net Sown Area
1	2	3	4	5	6	7	8	9	10	11
2009-10	369474	2.11	1.26	0.60	0.31	1.72	11.04	0.25	0.24	81.26
2010-11	369474	2.11	1.17	1.03	0.28	1.62	11.30	0.26	0.17	80.85
2011-12	369474	2.11	1.07	0.79	0.42	1.45	11.33	0.25	0.06	81.31
2012-13	369474	2.11	1.16	0.99	0.28	1.60	11.54	0.26	0.17	80.68
2013-14	369474	2.11	0.92	1.08	0.34	1.30	11.66	0.25	0.08	81.04
2014-15	369474	2.11	0.90	1.02	0.31	1.30	11.72	0.25	0.07	81.11
2015-16	369474	2.29	0.89	0.97	0.30	1.24	11.84	0.25	0.06	80.95
2016-17	369474	2.29	0.89	0.89	0.25	1.27	11.90	0.28	0.07	80.96
2017-18	369474	2.29	0.89	0.89	0.25	1.27	11.90	0.28	0.07	80.96

Source: Compiled from UPDES and District-wise Development Indicators file <http://updes.up.nic.in/spiderreports/initialisePage.action>

### 2.3.2 Trends in Operational Land Holdings

In Bulandshahr district, the total number of operational holdings has increased from 349 thousand in 2010-11 to 355 thousand in 2015-16, a net increase of 1.80 percent. While in the state, the number has increased from 23325 thousand in 2010-11 to 23822 thousand in 2015-16, a net increase of 2.13%. The majority of land holdings in the district are marginal and small. These

categories of holding together constituted 90.56% in 2015-16, while the corresponding percentage in the state was 92.81% (Table 5).

	Agri, Census	Marginal (0-1 ha)	Small (1-2 ha)	Semi-Medium (2-4 ha)	Medium (4-10 ha)	Large (10 & above ha)	Total ('000 No.)
Bulandshahr	2010-11	75.00	15.77	7.14	2.01	0.08	349.0
	2015-16	75.09	15.47	7.39	1.98	0.07	355.0
							[1.80]
Uttar Pradesh	2010-11	79.45	13.01	5.72	1.71	0.11	23325.0
	2015-16	80.18	12.63	5.51	1.58	0.1	23822.0
							[2.13]

Source: Compiled from Statistical Diary 2018-19, UPDES. Figures in [] are percentage increase/decrease in 2015-16 over 2010-11.

### 2.3.3 Trends in Area, Production and Yield of Principal Crops

#### 2.3.3.1 The trend in Cropping Patterns

Cereal crops dominate the district agriculture. Table 6 shows the trend in the area under principal crops during the last 8 years. In 2017-18, wheat constituted the highest share in the GCA (37.29%), followed by rice (19.54%) and maize (7.20%). The area under total cereals went up from 66.23% in 2010-11 to 71.76% in 2015-16 and then declined to 67.57% in 2017-18. Arhar is the major pulses crop and its share in the GCA has declined from 2.07% in 2010-11 to 1.33% in 2017-18. Thus, share of total pulses in the GCA has declined during the period. Mustard is main Oilseeds crop, which shared 1.50% of the GCA in 2017-18. Sugarcane is another important crop in the district. It is an annual crop and consisted 9.59% of CGA. Potato is a high-value but a more risky crop, which shared 1.54% of GCA in 2017-18. Overall, there has not been any significant change in the cropping pattern and no diversification of agriculture has happened in the district. The cropping intensity ranges between 169.1 and 179.6.

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	14.33	16.75	17.75	18.02	19.72	20.75	19.54	19.54
Wheat	37.95	37.76	37.27	37.49	37.64	39.60	37.29	37.29
Bajara	2.26	2.30	2.41	2.60	2.58	2.72	2.56	2.56
Maize	10.32	9.70	9.10	8.79	7.27	7.65	7.20	7.20
Other Cereals	1.37	1.19	1.33	1.13	0.99	1.04	0.98	0.98
Total Cereals	66.23	67.71	67.85	68.03	68.20	71.76	67.57	67.57



Arhar	2.07	1.84	1.72	1.58	1.34	1.41	1.33	1.33
Other Pulses	0.96	0.92	0.95	0.93	0.78	0.82	0.77	0.77
Total Pulses	3.03	2.75	2.67	2.50	2.12	2.23	2.10	2.10
Total Food grains	69.27	70.46	70.52	70.53	70.32	73.99	69.67	69.67
Mustard	1.54	1.53	1.79	1.76	1.51	1.59	1.50	1.50
Other Oilseeds	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02
Total Oilseeds	1.54	1.54	1.79	1.77	1.53	1.61	1.52	1.52
Sugarcane	9.88	9.52	9.56	10.04	9.68	10.19	9.59	9.59
Potato	1.45	1.47	1.56	1.51	1.55	1.64	1.54	1.54
Net Sown Area	57.31	57.70	57.23	56.98	56.32	59.14	55.69	55.69
Gross Sown Area (in 1000 Ha)	521.2	520.6	520.8	525.51	532.14	505.77	537.10	537.10
Cropping Intensity	174.4	173.3	174.7	175.5	177.6	169.1	179.6	179.6

Source: Compiled from UPDES  
<http://updes.up.nic.in/spiderreports/intialisePage.action>

### 2.3.3.2 Trends in Per Hectare Yield of Principal Crops

A perusal of Table 7 reveals that per hectare yield of most crops varies across years. Yield of wheat ranges between 27.31 to 43.40 qtls/ha during the period. A more or less similar pattern is also observed in the case of rice, whose yield was lowest in 2015-16 (20.18 qtls/ha) and highest in 2017-18 (26.57 qtls/ha). Maize yield ranges from 20.74 to 29.0 qtls/ha. Sugarcane's yield ranges from 575.6 to 786.88 qtls/ha; potato from 166.43 to 282 qtls/ha; pulses from 6.77 to 8.54 qtls/ha; and mustard from 9.30 to 21.02 qtls/ha. In brief, average yields of wheat, maize, mustard, sugarcane and potato are quite high in the district. However, the lack of consistency in the yields make the returns to farmers riskier and more unstable, which calls for a solid insurance protection measure.

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	22.61	23.88	25.83	26.31	25.61	26.50	20.18	26.57
Wheat	39.46	42.19	40.29	41.21	27.31	38.20	41.66	43.40
Bajara	19.78	18.59	19.95	21.28	20.28	21.16	17.47	20.36
Maize	20.74	22.05	23.71	23.69	23.26	22.79	29.00	28.35
Total Cereals	32.10	33.89	33.29	34.14	26.16	32.42	33.14	36.05
Arhar	6.57	6.91	9.73	8.28	7.81	6.99	6.97	5.61
Total Pulses	6.77	7.19	9.10	7.30	7.09	6.96	7.45	8.54
Total Food grains	30.99	32.85	32.37	33.18	25.58	31.66	32.36	35.22
Mustard	11.94	11.94	12.77	15.70	9.30	14.24	15.99	21.02
Total Oilseeds	11.94	11.93	12.76	15.68	9.22	14.13	15.81	20.83
Sugarcane	575.60	593.24	609.64	653.72	630.52	588.62	684.70	786.88

Potato	188.32	203.14	197.43	166.43	217.61	282.00	257.07	276.77
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Source: Compiled from UPDES

<http://updes.up.nic.in/spiderreports/intialisePage.action>

### 2.3.3 Trends in Production of Principal Crops

Table 8 depicts that in 2017-18, among cereal crops, wheat consisted of the highest production (869.19 thousand tons), followed by rice (278.84 thousand tons) and maize (109.65 thousand tons). Among pulses, the highest production (4.01 thousand tons) was from Arhar. Pulses production in the district was quite low, indicating that pulses do not have much role in the district agriculture. Mustard production was 16.93 thousand tons, which constituted 99.82% of total oilseeds production. Potato is other important crop, whose production ranges from 131.96 thousand tons to 233.24 thousand tons. Sugarcane production ranges from 2940.16 thousand tons 4054.61 thousand tons. Looking at yearly data of various crops' production, we observe that their production, on average, has increased over the period, but at the same shows fluctuation across years, partly due to vagaries of nature and partly due to market conditions.

**Table 8: Trends in Production of Principal Crops in Bulandshahr District (in 1000 Tons)**

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	168.82	208.21	238.78	249.21	268.74	278.07	211.72	278.84
Wheat	780.46	829.32	782.10	811.80	546.99	765.04	834.37	869.19
Bajara	23.34	22.28	25.02	29.07	27.89	29.10	24.03	28.01
Maize	111.56	111.39	112.33	109.40	89.98	88.16	112.17	109.65
Other Cereals	24.03	23.38	18.15	20.92	15.80	16.39	20.43	22.85
Total Cereals	1108.20	1194.59	1176.36	1220.40	949.40	1176.75	1202.71	1308.54
Arhar	7.09	6.60	8.74	6.86	5.59	5.00	4.99	4.01
Other Pulses	3.61	3.70	3.93	2.75	2.42	2.86	3.43	5.62
Total Pulses	10.71	10.30	12.67	9.61	8.01	7.86	8.41	9.64
Total Food grains	1118.91	1204.90	1189.03	1230.01	957.41	1184.61	1211.13	1318.17
Mustard	9.57	9.52	11.92	14.55	7.49	11.47	12.87	16.93
Other Oilseeds	0.01	0.02	0.01	0.01	0.02	0.04	0.00	0.03
Total Oilseeds	9.58	9.54	11.93	14.56	7.51	11.51	12.87	16.96
Sugarcane	2962.79	2940.16	3034.67	3450.40	3248.94	3033.06	3528.13	4054.61
Potato	142.33	155.77	160.12	131.96	179.99	233.24	212.63	228.92

Source: Compiled from UPDES

<http://updes.up.nic.in/spiderreports/intialisePage.action>

We have calculated average, standard deviation (SD) and coefficient of variation (COV) in the area, production and yield of principal crops to understand variability across years (Table 9). In the case of area under different crops, the lowest variability is observed in total wheat

(1.18%), followed by total food grains (1.33%), total cereals (1.86%), sugarcane (2.05%) and potato rice (1.96%). It is highest in Arhar (16.80%) followed maize (14.02) total pulses (13.83%) and rice (11.57).

**Table 9: Variability in Area, Production and Yield of Principal Crops (2010-11 to 2017-18)**

Crop/Year	Area (1000 Ha)			Production (1000 Ha)			Yield (Qtl./Ha)		
	Average	SD	COV	Average	SD	COV	Average	SD	COV
Rice	96.09	11.12	11.57	237.8	39.1	16.45	24.69	2.30	9.31
Wheat	198.33	2.34	1.18	777.4	99.2	12.75	39.21	5.07	12.94
Bajara	13.12	0.87	6.62	26.09	2.74	10.48	19.86	1.28	6.44
Maize	44.07	6.18	14.02	105.6	10.3	9.71	24.20	2.93	12.11
Total Cereals	357.54	6.67	1.86	1167.1	104.1	8.92	32.65	2.89	8.85
Arhar	8.28	1.39	16.80	6.1	1.5	24.64	7.36	1.25	16.92
Total Pulses	12.80	1.77	13.83	9.7	1.6	16.66	7.55	0.82	10.92
Total Food grains	370.34	4.91	1.33	1176.8	104.5	8.88	31.78	2.80	8.80
Mustard	8.35	0.59	7.06	11.8	3.02	25.64	14.11	3.55	25.16
Total Oilseeds	8.40	0.57	6.76	11.8	3.02	25.60	14.04	3.50	24.92
Sugarcane	51.21	1.05	2.05	3281.6	383.4	11.68	640.37	69.43	10.84
Potato	8.04	0.29	3.64	180.6	39.6	21.95	223.60	43.11	19.28

Source: <http://updes.up.nic.in/spiderreports/intialisePage.action>

Table 10 shows the comparison of proportion of major crops in total GCA and their proportion in total value of agricultural output (VOP). It is significant to note that on average, rice, total cereals, total pulses and total oilseeds have relatively more share in the GCA than their share in the VOP, while on average, sugarcane and potato have more share in VOP than GCA. Wheat shared about 37.29% of GCA in 2017-18, while their corresponding share in VOP was 37.56%. Potato has more share in VOP (5.56%) than in GCA (1.54%). Similarly, sugarcane also has more share in VOP (29.83%) than in GCA (9.59%). Three crops—wheat, paddy and sugarcane together comprised 66.42% of the GCA, while their in VOP was much higher at 84.91%. These are water guzzling and responsible for depletion of ground water in the district.

**Table 10: Share of Principal crops Total GCA and Total Value of agriculture products in Bulandshahr**

Crop	% Share in	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
		Wheat	GCA	37.95	37.76	37.27	37.49	37.64	39.60
	VOP	39.07	37.56	38.10	39.00	31.31	38.32	39.80	37.56
Paddy	GCA	14.33	16.75	17.75	18.02	19.72	20.75	19.54	19.54
	VOP	15.75	18.68	15.88	16.01	19.79	18.36	15.38	17.52
Total Cereals	GCA	66.23	67.71	67.85	68.03	68.20	71.76	67.57	67.57
	VOP	61.40	62.88	59.71	61.41	57.89	62.65	60.79	61.90
Total Pulses	GCA	3.03	2.75	2.67	2.50	2.12	2.23	2.10	2.10
	VOP	2.80	2.10	2.76	1.38	2.31	2.59	1.49	1.03

ARTH GANGA: DISTRICT BULANDSHAHR

Total Food Grains	GCA	69.27	70.46	70.52	70.53	70.32	73.99	69.67	69.67
	VOP	64.19	64.98	62.47	62.79	60.21	65.23	62.27	62.92
Total Oil seeds	GCA	1.54	1.54	1.79	1.77	1.53	1.61	1.52	1.52
	VOP	1.12	2.58	1.21	1.47	1.00	1.47	1.29	1.63
Potato	GCA	1.45	1.47	1.56	1.51	1.55	1.64	1.54	1.54
	VOP	3.78	6.36	8.81	4.78	5.58	3.99	3.89	5.56
Sugarcane	GCA	9.88	9.52	9.56	10.04	9.68	10.19	9.59	9.59
	VOP	30.90	26.07	27.50	30.92	33.15	29.26	32.53	29.83
Paddy + wheat + Sugarcane	GCA	62.16	64.03	64.58	65.55	67.04	70.53	66.42	66.42
	VOP	85.73	82.32	81.48	85.94	84.25	85.94	87.70	84.91
Total Agriculture (1000 Ha)	GCA	521.21	520.62	520.84	525.51	532.14	505.77	537.10	537.10
	VOP (in Cr Rs)	2397.07	3157.28	3089.61	3124.07	2743.06	3006.37	3362.56	4281.12
Per worker Gross Value of agriculture produce (1000 Rs. at current prices) <b>Bulandshahr</b>	-	64.51	77.52	85.22	77.24	92.39	90.93	115.39	
Per worker Gross Value of agriculture produce (1000 Rs. at current prices) in <b>Uttar Pradesh</b>	-	40.66	48.69	52.50	52.11	56.48	61.97	69.69	
Source:	Compiled		from			UPDES			
<a href="http://updes.up.nic.in/spiderreports/intialisePage.action">http://updes.up.nic.in/spiderreports/intialisePage.action</a>									

### 2.3.4 Consumption of Chemical Fertilizers

Table 11 shows trends in the consumption of chemical fertilizers in agriculture. The recommended ratio of nitrogen to phosphorous to potassium is 4:2:1, which is not being maintained in the district. For example, in 2010-11, nitrogen constituted 73.42% of total fertilizers used while the shares of phosphorous and potassium were 21.19% and 5.39%, respectively. However, in 2017-18, the share of nitrogen had declined to 66.87%, while share of phosphorous increased to 27.29% and the share of Potassium increased to 5.84%. The table also indicates that the consumption of chemical fertilizers varies across years, which may be due to various factors, including rainfall patterns, cropping patterns, etc. Chemicalization of agriculture degrades soil and water resources, which calls for use of organic manure and bio-fertilizers.

Fertilizer/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Nitrogen	171.91	114.78	140.35	100.57	106.07	102.53	95.85	114.24
Phosphorous	49.62	31.22	43.96	26.10	30.71	38.44	37.74	46.63
Potassium	12.62	5.01	5.98	3.57	6.30	7.12	7.85	9.98
Total	234.15	151.01	190.29	130.24	143.08	148.09	141.14	170.85
Source: Compiled from UPDES								

<http://updes.up.nic.in/spiderreports/intialisePage.action>

### 2.3.5 Irrigation Structure and Status

Table 12 shows no change in the length of canals (419 kms) during the last nine years. The number of government tube well has increased from 466 in 2010-11 to 503 in 2018-19. Number of shallow tube-wells went up from 71348 in 2010-11 to 75697 in 2018-19, a net increase of 6.1%. Both medium tube-wells and deep tube-wells have substantially increased during the last nine years. The net and gross cultivated areas in the district are almost 100%.

Name/Year	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19
Length of Canal (KM)	1879	1879	1879	1879	1879	1879	1879	1879	1879
No. of Govt. Tube wells	466	466	466	466	483	497	501	502	503
No. of Shallow Tube well	71348	72644	73554	73851	74112	74399	74909	75336	75697
Medium Tube well	99	210	212	220	233	273	379	379	413
Deep Tube well	16	16	16	22	22	32	42	45	54
% Of NIA	89.24	100	100	100	100	100	99.96	99.96	-
% Of GIA	100	100	100	100	100	100	99.98	99.98	-

Source: Compiled from UPDES  
<http://updes.up.nic.in/spiderreports/intialisePage.action>

Groundwater (GW) is the major source of irrigation in the district and its share in the NIA has increased from 90.41% in 2010-11 to 94.96% in 2017-18, while the corresponding share of surface irrigation has declined from 9.59% to 5.04% during the same period. Table 13 also shows that the GW development in the district has been quite high and only about 18% of GW has remained to be exploited.

Source/Year	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	2016 -17	2017 -18
Canal (surface Irri.)	9.59	8.69	8.64	7.84	8.36	6.78	5.04	5.04
Wells And Tube-wells (GW Irri.)	90.41	91.29	91.33	92.10	90.64	93.20	94.96	94.96
Others	0.00	0.02	0.03	0.06	1.00	0.02	0.00	0.00
NIA (1000 ha)	266.6	300.4	298.1	299.4	299.7	299.1	298.98	298.98
% Of Remaining GW to Total GW	18.09	18.09	18.09	-	18.09	18.09	18.09	-

Source: Compiled from UPDES  
<http://updes.up.nic.in/spiderreports/intialisePage.action>

### 2.3.5 Electricity Intensity in Agriculture



Electricity is one of the key source of energy used in agriculture. Table 15 shows that per capita consumption of electricity in agriculture has significantly increased from 280.55 KWH in 2011-12 to 527.21 KWH in 2019-20, a net increase of about 88 percent. The percentage share of agriculture in total electricity consumption in the district has also increased from 25.27% in 2011-12 to 35.07 in 2019-20, indicating that the electricity intensification in agriculture has substantially increased in the district.

<b>Division/ Year</b>	<b>2011-12</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
Per Capita electricity consumption (K.W.H)	280.55	281.35	259.31	480.6	529.57	529.91	527.21
% of electricity consumed in Agriculture sector to total consumption	25.27	27.00	25.54	27.83	30.79	33.35	35.07
Source: Compiled from UPDES <a href="http://updes.up.nic.in/spiderreports/intialisePage.action">http://updes.up.nic.in/spiderreports/intialisePage.action</a>							

### 2.3.6 Status of Agriculture Markets

Table 16 shows the marketing infrastructure in the district. It has nine main markets and five sub-markets, which remained constant during the period. Number of regulated mandies per lakh hectares of NSA ranges from 3.0 to 4.68.

<b>Category/Year</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
Main Markets (No.)	9	9	9	9	9	9	9
Submarkets (No.)	5	5	5	5	5	5	5
Total Markets (No.)	14	14	14	14	14	14	14
No. of Regulated mandis per lakh Ha. of net area sown	4.68	3.84	-	3.01	3.0	4.68	-
Source: Compiled from Statistical Abstract, Uttar Pradesh, and District-wise Development Indicators file.							

### 2.3.6 Status of Organic Farming

To promote sustainable agricultural practices and improve the farmers' livelihood, the Government of India launched PKVY and Namami Gange schemes. Under these schemes, farmers are incentivized to form groups to do organic farming and sell their products with PGS certification. Under the programme, the beneficiary farmers get Rs.12000, Rs. 10000 and Rs.9000 per hectare

respectively in the first, second and third year of the conversion period. The proposal is to cover about 3000 hectares of cultivated land under organic farming.

There is no assured market for these products and farmers do not get premium prices. They sell their products at the same prices their conventional counterparts do. Certification and quality check and monitoring mechanisms are yet to be set up. Only one FPO, named Samak Bio Energy Farmer Producer Co Ltd, is reported to be working in organic farming.

The transition period for the full conversion from conventional to organic is considered three years. During this period, crop-yield, on average, is expected to decline by 10—15 percent. But after three years, it may reach its original level. Financial assistance received by the beneficiary farmers seems to be adequate to compensate the yield losses and motivate them to do organic farming. There is a need setting up an integrated processing unit for the organic products. Monitoring of the project should be periodically done through MIS, Geo-tagging and monthly physical and financial reports. The policy-related issue is what after the three years? Will the government protect their income? There may be a possibility, in the absence of the regulatory framework, the beneficiary farmers may revert to conventional farming. Stakeholder discussion indicates that some old farmers of organic farming in the district are reverting to the conventional farming. In this context, two things need to be thought of—a well-designed regulatory and monitoring framework and introduction of payments for ecosystem services for the organic farmers after the transition period so that they may carry on the activity on a sustainable basis. Organic and zero budget farming will provide ecological services in terms of soil health, human and animal health, saving of water, protection bio-diversity, etc. To sustain the organic farming initiative, a long-term system of payments for ecological services may be evolved to retain the existing farmers and motivate others to move towards this sustainable farming system.

Table 17 shows the details of establishment of organic clusters under the Namami Gange and Paramparagat Krshri Vikas Yojana in the district. The district has 77 clusters in 15 development blocks. The highest number of clusters are in Dibai block (32), followed by Anoopshahr (10), Unchagoan (10) and Siyana (7). These four blocks together consisted of about 77% of total clusters. Each cluster has on average 50 farmers. It is reported that the maximum limit of land under a cluster per farmer is 2.00 hectares. Hence, majority of the beneficiary farmers are small and marginal. Since per hectare use of chemical fertilizer is quite high in the district agriculture, a gradual shift of farmers from conventional to organic farming system is likely to have positive impact on water quality and soil health along with farming sustainability. However, being a knowledge-intensive system of farming, farmers need proper training to know the practical details of the integrated sustainable farming system.

**Table 17: Status of Organic Farming PGS Groups under PKVY and Namami Gange Schemes in Bulandshahr (as on June 30, 2021)**

S. No.	Block	No. of groups	No. of farmers in groups			
			Total	Average	Median	SD
1	Agauta	1	50	50	50	0
2	Anupshahr	10	307	30.7	27.5	10.19
3	Araniya	1	50	50	50	0
4	Bulandshahr	2	100	50	50	0

5	Dhanpur	1	50	50	50	0
6	Dibai	32	1041	32.53	31	8.26
7	Gulaothi	1	50	50	50	0
8	Jahangirabad	3	150	50	50	5
9	Khurja	2	100	50	50	0
10	Lakhaothi	1	50	50	50	0
11	Pahasu	2	100	50	50	0
12	Shikarpur	1	50	50	50	0
13	Sikandrabad	3	150	50	50	0
14	Syana	7	325	46.42	50	9.44
15	Unchagaon	10	301	30.1	27.5	8.99
16	District Total	77	2874	37.32	37	11.2
Source: <a href="https://pgsindia-ncof.gov.in/LGList.aspx">https://pgsindia-ncof.gov.in/LGList.aspx</a>						

The major problem for the growth of organic farming observed are:

1. The major problem of the farmers was poor marketing of the organic products and not being able to fetch a premium.
2. Scaling up of the organic production is another problem. The problem of marketing is even more serious in the case of perishable vegetable crops. Contract farming companies and Farmer Producers' companies can be encouraged.
3. Farmers practiced organic farming only on a small part of their land (less than one ha) to get the scheme's benefit.
4. Although organic farming clusters are formed, the farmers allocated a part of their lands to organic farming and practiced conventional farming in the rest of the area, which may contaminate of the organic produce and fail the purpose of the cluster approach in organic farming.
5. According to the farmers, implementing policies initiated to promote organic farming in the area is not very efficient as the inspection is not conducted regularly, and the farmers did not receive subsidies in time under the scheme.
6. The knowledge and awareness level regarding practices under organic farming was inadequate among farmers.

#### 2.4 Trends in Livestock

Livestock has an essential place in the rural economy. Table 18 shows that the total number of indigenous cattle has increased from 129253 in 1997 to 132054 in 2019. However, the increase was only due drastic increase in the number of cows (from 61890 in 1997 to 113297 in 2019), while number of male cattle steeply declined (from 67363 to 18757) during the same period. Number of exotic cows has substantially increased from 22548 in 1997 to 150403 in 2019. Overall, total number of cattle went up from 167094 in 1997 to 304321 in 2019, a net increase of 82%. Comparing 1997 and 2019 data, we observe that number of female buffaloes has substantially increased from 590115 in 1997 to 864316 in 2019. However, there has been steep decline in the number of male buffaloes from 217868 to 107711 during the same period. Number of sheep has also declined from 12767 in 1997 to

3793 in 2019. However, number of goats also evince rise and fall, but still number is quite high. The number of pigs shows drastic decline in 2019 over the preceding years.

It is significant to note that the number of female cattle and buffaloes has substantially increased over the period, indicating the growth of livestock products, including milk. The substantial decline in the number of male cattle and male buffaloes also shows the rising farm mechanization and declining relevance of animal power, mainly because of the high maintenance cost of livestock. How number of male buffaloes is still high. Farmers use male buffalo in carting as well as cultivation, replacing oxen. The district is leading in livestock production. As shown in Table 2 above, livestock contributes about 50% of GDDP of agriculture and allied sector, even higher than the crop sector, including horticulture.

Dairy activities are the main subsidiary occupation in the district. Marketing of milk has no problem. Farmers purchase good quality buffaloes and cows from Haryana. Fodder and cattle feed has no problem to the cultivators because of the sound agricultural base of the district. There are 887 milk producers' societies with membership at 42760 and 13 milk routes covering 950 villages. District level unit PCDF (DUSS) is looking after testing, collection, transporting and marketing of milk. Nine Societies provide with Automatic Milk Collection Units (AMCU), which facilitate milk testing as well as measurement. About 24 private dairy plants are procuring 7.00 lakh litres milk per day. There are 71 dairy farms, and 156 Gaushalas in the district.

**Table 18: Trends in Livestock population (in numbers) in Bulandshahr**

	Category	1997	2003	2007	2012	2019
Indigenous Cattle	Total Male	67363	50019	48266	31292	18757
	Total Female	61890	56413	59173	54817	113297
	Total	129253	106432	107439	86109	132054
Exotic Cattle	Total Male	15293	24116	25432	43324	21864
	Total Female	22548	34554	43054	95122	150403
	Total	37841	58670	68486	138446	172267
Total Cattle		167094	165102	175925	224555	304321
Buffalo	Total Male	217868	317499	365712	329369	107711
	Total Female	590115	792139	860434	914279	864316
	Total	807983	1109638	1226146	1243648	972027
Sheep	Total Indigenous Sheep	9620	5619	5268	1968	3376
	Total Exotic Sheep	3147	2454	2317	1167	417

	Total Sheep	12767	8073	7585	3135	3793
Goat	Total	145089	169199	196920	199186	127975
Pig	Total Indigenous Pig	42926	30069	25293	11513	4971
	Total Exotic Pig	11746	9208	8865	7666	1361
	Total Pig	54672	39277	34158	19179	6332
Total Livestock		1212090	1509110	1646196	1696151	-
Total Poultry		154117	175055	152556	227637	-

Source: Compiled from UPDES

<http://updes.up.nic.in/spiderreports/initialisePage.action>

And <http://dahd.nic.in/animal-husbandry-statistics>

## 2.2 FORESTRY

The present forest area in the District is 7726.57 ha. The area under afforestation in various government schemes is 2744.25 ha. The plantation along the river banks under the Namami Gange is 235.50 ha. Ganga Upvan established in Karanwas has 32.04 Lakh & 2.26 Lakh plants along the banks of rivers Ganga, Kali, Nim and Karvaan. There has been no reported change in the decadal forest cover.

Moderately Dense forests	Open forests	Total	% of total area	Change w.r.t 2017 assessment
49.72	115.40	165.12	3.66	-0.88

*Table 5: Type of forest cover in Bulandshahr*  
*Source: Forest Statistics India 2019 assessment*

## 2.3 WETLANDS

Several wetlands grace the district of Bulandshahr. The district falls in the doab region of Ganga and Yamuna. Ganga, Kali Nadi, Karwan Nadi and Nim Nadi drain it. The flow towards the south east.

Bulandshahr wetlands face high degree of pollution by the industrial, municipal and agricultural wastes. Fertilizer and pesticides are over used in the agricultural lands and toxic chemical pose a threat of bio magnification of toxicants.



S No.	Wetland Category	No. of wetlands	Total area wetland (ha)	% of wetland area
1	Lakes/Ponds	37	674	7.33
2	Ox-bow lakes/cut off meanders	3	49	0.53
3	Riverine wetlands	2	11	0.12
4	Waterlogged	134	2101	22.58
5	River/stream	10	5009	54.49
6	Tanks/Ponds	90	382	4.16
7	Wetlands (<2025 ha)	967	967	10.52
	Total	1243	9193	100

*Table 7:Area estimates of wetland in District Bulandshahr  
Source: Ganga River Basin management plan IIT 2012*

The upper Ganga stretch passing Bulandshahr is a Ramsar site and also important for Dolphin preservation.

## 2.4 TOURISM

For tourism there are several religious places in the district. On Ganga River Narora, Rajghat, Karnvas, Anoopshahr, Ahar and Gajroula are famous places for religious dips and temples.

The tourism in Bulandshahr is a promising avenue for much needed employment and earning. As many as 20 Lakh tourists and pilgrims have graced Bulandshahr for various festivities etc.

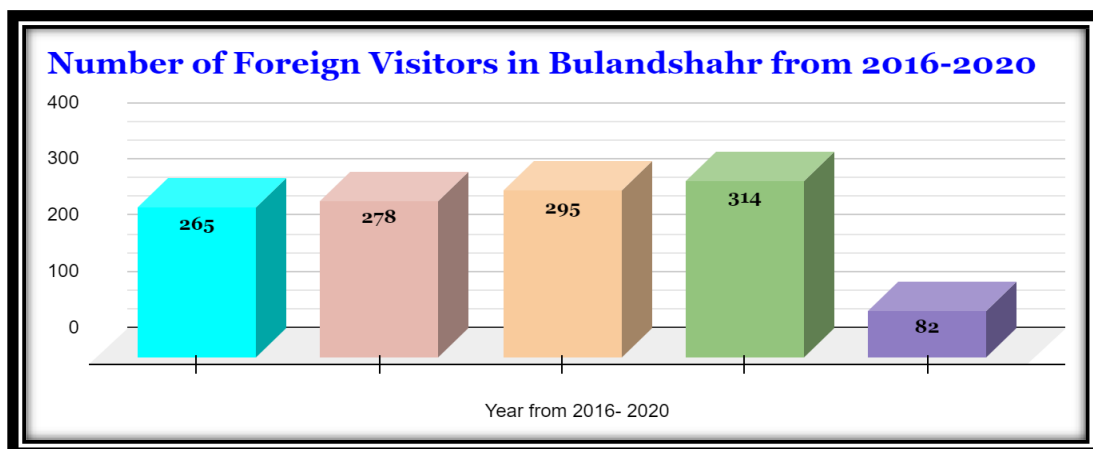
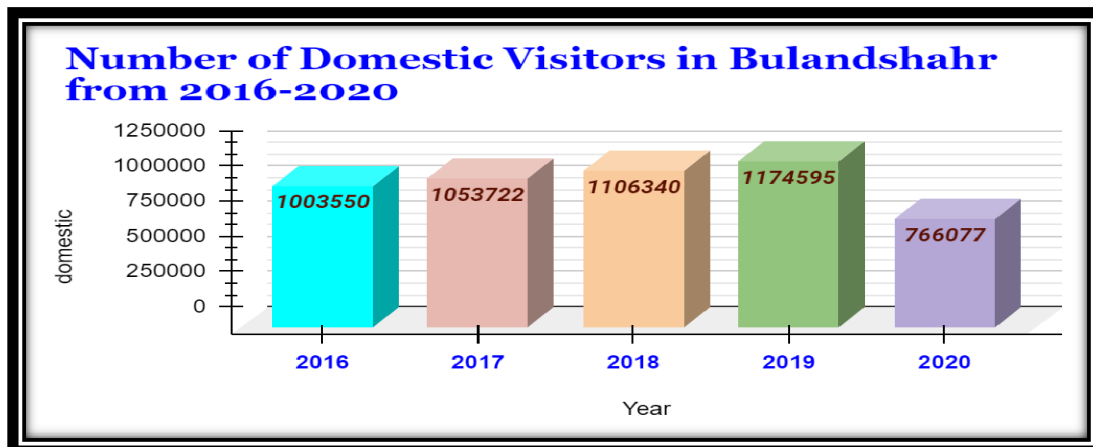
The history of Bulandshahr begins even before 1200 B.C. This region was nearer to the capital of Pandavas – Indraprasth and Hastinapur hence gained importance in the past. After the decline of Hastinapur, Ahar, situated in the northeast of District Bulandshahr, became the controlling centre for Pandavas. As time passed, king Parma made a fort in this part of the region, and another king Ahibaran laid the foundation of a tower Baran (Bulandshahr). Since it was perched on a highland, it became famous as a high city translated as Bulandshahr. Today we know this city with the same name Bulandshahr.

The ancient ruins found at Bhatora Veerpur, Ghalibpur etc. signifies the historical importance of the city Bulandshahr. There are many other important places in the district from where statues of medieval age and objects of ancient temples had been excavated. In the present time, several historical and ancient objects such as coins, inscriptions etc. are preserved in Lucknow State Museum, Lucknow. Delhi airport is the nearest airport, which is 92 km from Bulandshahr.

The data table below presents the numbers of foreign and domestic visitors in years ranging from 2016 to 2020. The data has been taken from the official websites of the Government of Uttar Pradesh and the Department of Tourism, Uttar Pradesh.

<b>Bulandshahr tourist visits, 2016-2020</b>			
<b>Year</b>	<b>Domestic</b>	<b>Foreign</b>	<b>Total</b>
2016	1003550	265	1003815
2017	1053722	278	1054000
2018	1106340	295	1106635
2019	1174595	314	1174909
2020	766077	82	766159

Source: Tourism Dept. Uttar Pradesh



Source: Tourism Dept. Uttar Pradesh

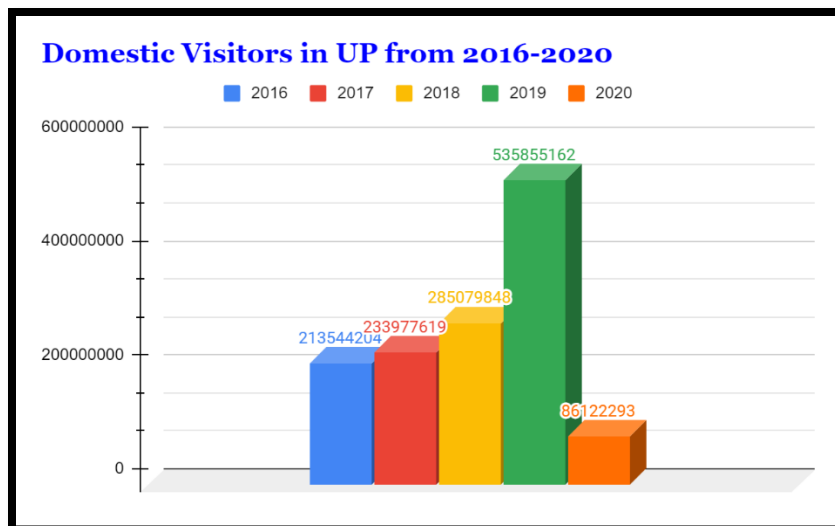
From the above-given data, it can be visualized that the number of domestic and foreign visitors in Bulandshahr increased continuously from the year 2016 to 2019. In the year 2020, the number of domestic as well as foreign visitors decreased several folds. The reason is quite apparent is the international and domestic lockdown in response to the Covid-19 pandemic.

It is also important to note that the number of foreign visitors is meagre. It increases from 2016 to 2019, but the growth rate in numbers is not significantly high. In the year 2016, the number of foreign visits was 265, and it increased to 278 in 2017, which is approx a 5% growth in numbers. In the year 2018, the increase is 6% growth. In 2019, the number increased to 314, which is 6% growth compared to the previous year.

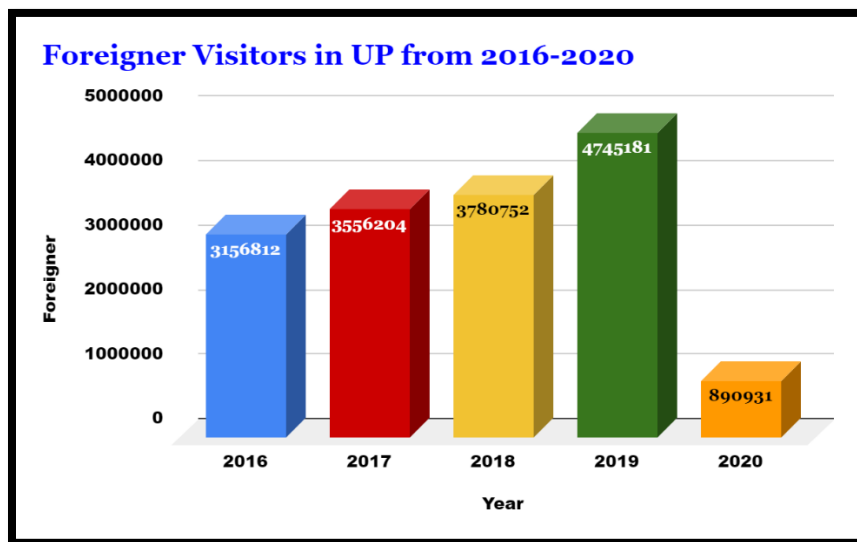
The below given table presents the the visitors who visited Uttar Pradesh from 2016 to 2020. The data is bifurcated in two major groups in which the number of domestic visitors and foreign visitors is mentioned. The table also shows the the percent increase or reduction of tourists compared to previous year in Uttar Pradesh.

<b>The Indian and Foreign Tourist visits in Uttar Pradesh from 2016 to 2020</b>						
Year	Indian	Foreigner	Total	Percentage increase/ reduction in comparison to previous year		
				Indian (%)	Foreigner (%)	Total
<b>2016</b>	213544204	3156812	216701016	3.4	1.69	3.37
<b>2017</b>	233977619	3556204	237533823	9.56	12.65	9.61
<b>2018</b>	285079848	3780752	288860600	21.84	6.31	21.6
<b>2019</b>	535855162	4745181	540600343	87.96	25.5	87.14
<b>2020</b>	86122293	890931	87013224	-83.92	81.92	-83.9

**Source: Department of Tourism Uttar Pradesh**



Source: Department of Tourism Uttar Pradesh



Source: Department of Tourism Uttar Pradesh

The above-given graph shows the number of visitors who visited Uttar Pradesh from 2016 to 2019. In the year 2016 number of domestic tourists increased to 3.4% compared to 2015, and foreign tourists increased to 1.69%. In the year 2017, the growth rate increased to 9.56% in domestic tourists and 12.65% in foreign tourists.

Data shows that 2018 had been a fruitful year for Uttar Pradesh tourism. Uttar Pradesh encountered a 21.6% increase in tourist numbers from the previous year, a significant change in numbers.

2019 was a year when the global event **Kumbh Mela 2019** was organised in Prayagraj (a District in Uttar Pradesh). The results are visible in the numbers (given in the data table above), 87.14%

increase in the number of tourists compared to 2018. The data also shows foreign visitors increased to 25% in 2019. The enhanced response of tourists shows the consumer behavior, which majorly depends on advertisements. A commodity that has been presented to be associate with the emotions of consumers has a high potential to sustain and perform better than its competitors.

The surge in the number of tourists in Kumbh Mela 2019 is attributed to expensive advertisements, extra-standard facilities, and a political campaign. All this together made the event a mega event. Security aspect in such organization is a significant factor which influences the success and failure. Kumbh Mela 2019 witnessed extra tight security and surveillance to prevent stampedes and violence in the Mela.

Such grand organization of events are also a factor on which the number of tourists to other districts (especially domestic tourists) and states (especially foreigner tourists) depend. Although the number of tourists did not significantly increase in Bulandshahr during Kumbh Mela 2019. The district witnessed the same rate of increase, which was 6 per cent compared to the previous year. It is necessary to understand the shortfalls before working on upcoming policies and agendas.

The below-given data table shows the budget allotted to the Department of tourism from 2015-16 to 2021-22. The values are mentioned in Indian rupees.

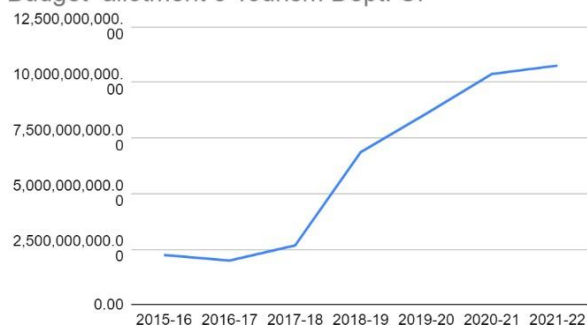
<b>Budget -Department of Tourism, in Different Years</b>		
<b>Year</b>	<b>Budget in Rupees</b>	<b>Percent increase or decrease</b>
2015-16	2,245,098,000.00	
2016-17	1,992,912,000.00	-11.23%
2017-18	2,671,016,000.00	34.03%
2018-19	6,870,209,000.00	157.21%
2019-20	8,596,205,000.00	25.12%
2020-21	10,382,037,000.00	20.77%
2021-22	10,759,153,000.00	3.63%

**Source: Department of Tourism Uttar Pradesh**

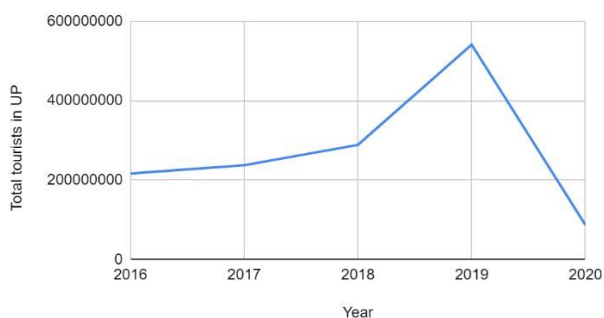


The above-given map shows the budget sanctioned for the Department of Tourism, Uttar Pradesh, from the Financial Year (FY) 2015-16 to 2021-22. In the initial FYs, which are 2015-16, 2016-17, 2017-18, the amount sanctioned to the department is significantly low. In the FY 2018-19 Department received a 157.21% increased budget. Which followed a 25% increase in the next FY-2019-20. A similar trend is visible in the number of tourists, skyrocketing of tourists is found in the same years. This directly implies that the money spent is directly proportional to the tourists in particular FY.

Budget allotment o Tourism Dept. UP



Total tourists arrival in UP Year 2016 -2020



The trendlines mentioned above side by side show the trend of budget allotment to the Tourism and increase in tourist arrivals. Before 2020 the trendlines follow a similar pattern: the money allotted to the Department is directly proportional to the Tourist arrival in the State. 2020 is an exception during which pandemic seized the tourism activities

## 2.5 ENERGY

For renewable energy, solar, biomass and biogas are the sources exploited in Bulandshahr. Under solar electrification mission, UP has an installed capacity of 1292MW. Major solar electrification heads have been under solar parks, roof-top on government buildings, cantonments, floating solar installations and some off grid items like solar lights, pumps etc.

In the Khurja super thermal power plant; solar installations within the premises and on available roof tops is being mooted.

The district has three sugar mills with potential for Bagasse based power plants. Community based biogas and recycle of waste for productive use is present in 65 villages at present.

The biomass availability is crop residues, livestock manure, and horticultural tree seeds in the district and has a power generation potential. Other than agricultural residue, three sugar mills are currently in the district and should be linked to a bagasse-based power plant scheme. A case study

by Vijay et al., 2021 shows the potential for biogas generation by different biomass present in the district.

**Table 16 Crop biomass availability and power generation potential <sup>[1]</sup>.**

Category	Crop	Residue type	Low heating value (MJ/kg)	Carbon content (%)	Crop harvesting period	Gross biomass potential (kt)	Power potential (kW)
Cereals	Rice	Straw	15.54	41.8	Oct-Dec	213.10	9236.5
		Husk	15.54	38.2			
	Wheat	Stalk	17.15	45.8	Mar-May		
		Pod	17.39	42.3			
	Maize	Cob	17.39	43.7	Sep-Oct		
		Stalk	16.67	45.6			
Sugar cane	Sugar cane	Bagasse	20	45.4	Dec-Mar		
		Tops and leaves	20	39.7			

**Table 20 Livestock availability and power generation potential<sup>[1]</sup>.**

Livestock	Residue type	Manure yield (kg/day)	Manure required for biogas (kg/m <sup>3</sup> )	Carbon content (%)	Availability period	Gross biomass potential (kt)	Power potential (kW)
Cow	Manure	10	25	35.5	Everyday	334.59	1341.1
Bullock	Manure	15	25	36.8			
Buffalo	Manure	15	20	37.2			

**Table 21 Horticulture biomass availability and power generation potential.<sup>[1]</sup>**

Tree species	Residue type	Seed yield (kg/year)	Seeds required for	Carbon content (%)	Availability period	Gross biomass	Power potential (kW)
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			biogas (kg/m <sup>3</sup> )			potential (kt)	
<b>Acacia nilotica</b>	Tree Seed	20	3.02	42.1	Apr-Jun	1.945	59.4
<b>Albizia lebbek</b>	Tree Seed	20	2.77	47.3	Jan-Mar		
<b>Leucaena leucocephala</b>	Tree Seed	35	2.9	44.8	Feb-May & Aug-Nov		
<b>Prosopis juliflora</b>	Tree Seed	35	2.81	40.7	Mar-May & Oct-Dec		
<b>Pongamia pinnata</b>	Tree Seed	25	1.6	47.8	Nov-Dec & Mar-May		

[1] Vijay, V., Subbarao, P. M. V., & Chandra, R. (2021). An evaluation on energy self-sufficiency model of a rural cluster through utilization of biomass residue resources: A case study in India. *Energy and Climate Change*, 2(February), 100036. <https://doi.org/10.1016/j.egycc.2021.100036>

Biogas potential from animal waste calculated in this study is given below.

**Table 22 Biogas potential in district by animal waste.**

Livestock	Residue type	Total population as of 2012	Manure yield* (kg/day)	Total manure generation annually (kg)	Average collection (75%)	Dry manure after removing Moisture content	Manure required for biogas* (kg/m <sup>3</sup> )	Biogas potential (m <sup>3</sup> /yr)
<b>Cattle</b>	Manure	2,24,555	10	81,96,25,750	614719312.5	122943862.5	25	4917754.5
<b>Buffalo</b>	Manure	12,43,648	15	6,80,89,72,800	5106729600	1021345920	25	40853836.8
<b>Sheep</b>	Manure	3,135	1	11,44,275	858206.25	171641.25	25	6865.65
<b>Goat</b>	Manure	1,99,186	1	7,27,02,890	54527167.5	10905433.5	25	436217.34
<b>Pig</b>	Manure	19,179	2.5	1,75,00,838	13125628.13	2625125.625	25	105005.025
<b>Poultry</b>	manure	99,474	0.1	36,30,801	2723100.75	544620.15	25	21784.806

**Assumption: manure availability=everyday, moisture content= 80%, biogas plant is running every day with the same rate.**

**Source:** <https://vikaspedia.in/energy/energy-production/bio-energy/biogas>

**Table 7 Biogas potential from agricultural waste.**

Crop	residue type	Total crop production (tons) (2017-18)	Residue production ratio	Residue amount (tons)	Average collection (70%)	Moisture content	Residue amount after removing moisture (tons)	Biogas potential [m <sup>3</sup> /(tons of dry matter)]	Overall biogas potential (m <sup>3</sup> )
Maize	straw	109653	1.5	164479.5	115135.65	15	97865.3025	800	78292242
Wheat	straw	869193	1.5	1303789.5	912652.65	30	638856.855	800	511085484
Sugarcane	Bagasse	4054612	0.33	1338021.96	936615.372	80	187323.0744	750	140492305.8

Hydropower projects are divided into two categories based on their size: large and small hydropower. Small hydropower facilities with a capacity of 25MW or less are categorized as small hydro in India, including micro (100kW or less), mini (101kW-2MW), and small hydro (2-25MW) sectors. Hydroelectric projects do not exist now, but different sites have been identified for future small hydro projects. Table 9 and Table 9 present different sites, locations, and capacities of small hydro projects identified/investigated.

**Table 8 Identified/investigated sites of Small Hydro projects by NEDA**

S. NO.	Name of Project	District	River	Location	Discharge (cumecs)	HEAD (m)	Capacity (KW.)
1	Walipura	Bulandshahr	Upper Ganga	133-5-564	30.15	2.20	400.00

**Table 9 Identified future small hydro projects (MNRE report)**

S.NO.	Name of project	Category of project	Name of river/canal	Capacity in kW	Head in m	Discharge in m <sup>3</sup> /sec
1	Mat Br. RD 9-1-0 M	Canal	Mat Br.	530	1	-
2	RD 10-3-0	Canal	Anupsahar C	800	2	45
3	RD 16-7-0	Canal	Anupsahar C	1100	3	44
4	RD 24-1-0	Canal	Anupsahar C	500	2	35

## 3 QUALITATIVE DATA

### 3.1 AGRICULTURE & ALLIED ACTIVITIES

The principal kharif crops sown in the district are rice, maize, millet, pulses (arhar, moong, etc.), sugarcane and fodder, while the major rabi crops are, wheat, barley, pea, gram, potato, fodder and sweet potato. Further, the crops of the district are divided in two categories: food grains and non – food grains or cash crops. The proportion of food grains, especially wheat and rice, is higher than that of non – food grains in the whole district. Among the non – food grains, potato, mustard, sugarcane and fodder are major crops of the district in which except fodder, all the crops are mainly grown as cash crops. Recently farmers have taken to vegetables, turmeric and mint since they assure good returns.

Under organic farming, a two-day training program was initiated in all 32 Ganga Grams. Under convergence with Rashtriya Krishi Vikas Yojana, 96 vermicompost units were constructed in the Ganga Grams. Under organic farming, zero budget natural farming methods were promoted by the DGC. In the district Farmers have 100% irrigation coverage, mainly through electrified tube-wells and they generally over-irrigate their farms, as marginal cost of water extraction is almost zero, being the flat-rate electricity charges system. Organic farmers mostly use vermicompost and manure, and some farmers with adjoining farms had come together to practice organic farming in a cluster in some cases.

One of the success stories from this area is the initiative taken by a farmer, Mr. Bharat Bhushan Tyagi, who motivated other farmers to do organic farming and also providing training support to them. However, farmers face the issue of poor marketing of produce and lack of bio-fertilizers and pesticides. They are not able to fetch any premium for their produce and sell it the same price as that of conventional produce. Because of this, conventional farmers have less interest switching to organic farming. Organic farmers attempt to sell their products directly through their group-network and acquaintances.

General consumers are not willing to pay a premium for organic products. Use of technology such as laser land leveling and zero tillage are not widely used. Some conventional farmers show interest in switching to organic farming but because of the poor marketing structure for organic produce of their counterparts, they have not yet made the switch. It is also observed that in some cases cluster were not formed in true sense as all the farmers in the group did not have their land adjoining to each other.

Livestock, forestry & logging and Fishery (allied activities) are the growth drivers of the agriculture and allied sector. Their combined share in agriculture and allied sectors went up from 51.01% in 2011-12 to 54.05% in 2018-19. There is huge potential of income and employment generation in the primary sector making integrated plan of organic crops and horticulture along with fishery and livestock. To understand the potential of up-scaling of organic farming in the district, we conduct the SWOT analysis as given below:

### SWOT Analysis of Organic Farming in the District

<p style="text-align: center;"><u>Strengths</u></p> <ul style="list-style-type: none"> <li>• The abundance of organic manure (cattle urine &amp; Dung)</li> <li>• Rising number of cows and buffaloes</li> <li>• Branding and certification (PGS)</li> <li>• Less dependence on external inputs</li> <li>• Small land holdings (suitability for organic vegetables, including Potato)</li> <li>• Already presence of organic farming</li> </ul>	<p style="text-align: center;"><u>Weaknesses</u></p> <ul style="list-style-type: none"> <li>• Lower productivity during the transition period</li> <li>• Inadequate marketing infrastructure and market linkages</li> <li>• Knowledge and skills-deficit in OF</li> <li>• Lack of effective monitoring</li> <li>• Inadequate testing and certification system</li> <li>• Inadequate extension services</li> <li>• Lack of effective farmers' Organisation</li> </ul>
<p style="text-align: center;"><u>Opportunities</u></p> <ul style="list-style-type: none"> <li>• Income-elastic demand for organic products, including milk and meat</li> <li>• Crop-livestock integrated farming system</li> <li>• Common “Namami Gange” brand</li> <li>• Possibility of Convergence with MGNREGA</li> <li>• Local livelihood generation through production and sales of bio-fertilizers &amp; Bio-pesticides</li> <li>• Huge scope for Agro-processing</li> <li>• Government Institutional and policy support</li> <li>• Location advantage ( proximity to NCR Delhi)</li> </ul>	<p style="text-align: center;"><u>Threats</u></p> <ul style="list-style-type: none"> <li>• Risk of Reversibility after the project period</li> <li>• High transaction cost</li> <li>• Market risks</li> <li>• Shortage of labour in agriculture</li> <li>• Sustainability risk</li> <li>• Relatively more prone to pests and insects</li> </ul>

### 3.2 ENERGY

According to a baseline survey of 2008; the minority concentrated districts of UP (Report of Bulandshahr district), conducted by YP Singh, Giri Institute of Development Studies, the electricity supply is erratic in the district. Proposed solutions include MicroHydel Projects on the main river which have technologically evolved a great deal.

Current status of solar power at Khruja super thermal plant is as follows: “Necessary provision for harnessing solar power has been made. Currently, construction works of township/guest house/offices etc. are under progress. Roof top solar modules shall be installed after completion/finishing of construction works. Under CSR Works, Installation of Solar lights has been done and commissioned at site. In addition, 50 Nos. of street lights have also been installed”.

### 3.3 FORESTRY AND WILDLIFE

The type of vegetation here depends mainly on soil, sub – soil water and minor topographical features. In the western and central portion, the soil does not seem naturally well adapted to the

growth of the mango. The eastern part, where the soil is sandy, loamy and light and wet, favors more forest area with numerous grooves of Mango and Guava. The commonest and the most useful tree is 'Babool' or Kikar. It flourishes everywhere, in good soil and bad, and has rapid growth. It does not cause much harm to the cultivation, and at the same time gives us excellent timber for agriculture and domestic purposes. The wood is hard, tough and heavy, and is used for making cylinders for wells, boxes, wheels, agricultural implements and charcoal as well. Often thick patches of jungles of Dhak trees are seen in all parts of the district. The most important of these were in the western portion of Paragana Siyana and Augata. These jungles are shrinking of rapid population increase and extending cultivation by cutting them. The other common timber trees are sheesham, neem, peepul, circas, ashok, bargad, gular, neoj, amalatas, jamun, and mango. Apart from these, Samudra Sokh, Water Nukhattibuti, Strawberry, Bhat Katairin, Goonth Brahmi, Arusa, Ber, Doob, Munj etc. are the plants with medicinal value. Among the shrubs and climbers, the most common are: Tendu, Karaunda, Makoh, Akash Bel and Dudhi Bel.

### 3.4 TOURISM

#### 1. Eco-Tourism:

Eco-tourism includes programs that minimize the adverse effects of traditional tourism on the natural environment and enhance the cultural integrity of local people. Responsibility of both travelers and service providers is the genuine meaning for eco-tourism.

To ramp up tourism, DGC has taken up the work of wetland rejuvenation. Water Body Rejuvenation was one of the key initiatives of the DGC to ensure Aviral Ganga. In convergence with MGNREGA, 237 water bodies were revived in the district. Water conservation was prioritized through creation of rainwater harvesting systems and construction of check-dams. Through these efforts, eco-tourism may see a boost. The DGC has undertaken eco-tourism initiatives, where a 5km nature walk trail was constructed along Ganga. This initiative was considered with the expectation to be the source of livelihood for the locals, who would be trained as guides for visitors and be employed at local shops.

Apart from these, Narora has the distinction of being an important bird area in the "global network for conservation of birds"

Other avenues for tourism include several places of religious and historical importance.

In Belon village, is the famous temple where thousands of devotees pray for happiness and satisfaction each Navratri to "Maa Sarvmangala".

In Ahar is "Avantika Devi" shrine. There is Shiv temple in Ahar where Pandavas prayed for victory before the Mahabharata war! In Karnvas (where Karna of Mahabharata lived) is the shrine of Kalyani Devi.

Kala Aam is a site of historical significance, as Britishers executed the revolting Indians here. The Kuchesar mud fort is a heritage resort which was formerly a part of the princely state of Kuchesar.



## 2. Sustainable Tourism

It is a type of tourism in which all the needs and desires of a tourist/ and other stakeholders of tourism industry is fulfilled without compromising the ability of the future generation to utilize the tourism. Several goals of Sustainable Developments Goals are also seen associated with sustainable tourism. Such as life below water and life on land, are impacted by human activities if the tourism place is a water body of forest area, hence it is the duty of all of us to take care of sustainability aspect in the tourism. Sustainability for local/natives can be provided by including them in trade and business activities.

There a sense of responsibility of different stake holders associated with the tourism to develop sustainable tourism. In which each stakeholder takes care of other stakeholder and biotic and abiotic factors. For example, reducing the Carbon footprint produced by per visitor, using eco-friendly vehicles to roam around, supporting local businesses.

One example of sustainable tourism is promoting tourist to travel off-season. It will reduce the impact of seasonal unemployment on the marginal traders and other workers in the tourism sector.

Offering eco-friendly services is another example of sustainable tourism. Providing tourists with cycle to roam around nearby places with help in reducing carbon footprint and it economical. It is aimed at minimum negative impact on environment created by tourism activities.

### 3.4.1 Tourist Places

#### 1. Karnavas –

The Place had great importance due to its mention in Mahabharata. It is believed that in Karanvas, King Karna used to donate 50 kilograms of gold regularly. Another temple of diety Kalyani is located in this place. The Aligarh-Bareilly railway line can be reached by landing at Rajghat railway station nearby; Karanvas is aprox. 5 kilometers from there.

Ahar is a temple situated on the bank of river Ganga in Bulandshahr which possess the goddess Avantika and another temple of Lord Shiv.

As the name suggests, Karnavas, this place was named after Karna who is known for his bravery and sacrifice in the Mahabharata. King Karna was known as Danveer Karna because of his philanthropic activity. In the story of Mahabharata, it is mentioned that he donated his Earrings and Shield, which used to be life savior during wars.

#### 2. Anupshahr

Situated 46 kilometers from the Bulandshahr city, can be travelled via UPSRTC buses or private vehicles. According to historical scripts, Anupshahr was founded by Bargujar(Rajput clan) Raja Anup Rai, who was a Rajput King between 1605 and 1628. During this period Mughal Emperor Jahangir had his kingdom in the capital. There is a anecdote that Anup Rai saved the life of Jahangir in a lion hunting expedition. As a result of which Jahangir donated the area to Anup Rai

and he established the township and a fort in the region and his kingdom. The eighth generation of founder; Tarasingh flourished the city to a next extent and established it as ayurveda centre.

The town is called as Choti Kashi because its geographic location situated on the banks of the river Ganga. Numerous small and medium temples are located near the river giving it a kashi like overview.

### **3. Belon –**

It is located 60 kilometres towards East from District headquarters Bulandshahrand 349 KM from State capital Lucknow. Belon is a tiny village located near Narora in Bulandshahr of Uttar Pradesh. Belon is famous for the old shrines of Goddess Belon. The name Belon is taken from Bilwan which comes from its groves of Bael Tree (Bengal quince).

Belon temple is a archaic Hindu temple and is a famous Hindu pilgrimage site. The temple is posseses Sarva Mangala Devi, the goddess of all wellbeing and prosperity. It is believed that a visit in the temple brings happiness in the life.

There is a ritual of playing Holi with Tesu Phool (Flowers of Palash) instead of colours. This temple is usually crowded by tourists during the months of October through March, because of pleasant temperature. Thousands of people and devotees visit the shrine during Navratri.

### **4. Kuchesar**

Situated at a distance of 39 km from Bulandshahr, 55 km from Meerut, Kuchesar is village in Bulandshahr district of Uttar Pradesh. Kuchesar is an ideal weekend getaway from Noida, Delhi and Gurgaon because of its central location and heritage site. Kuchesar is especially known for the Kuchesar Fort, also known as Rao Raj Vilas, which was built by the Jat Kings.

The Kuchesar fort was built in the mid-18th century by the Jat Kings and is possessed by a 100-acre mango grove blanket, which gives a scenic effect to the site.

The Mud Fort has seven turrets built as defense mechanism against British cannon attack and reflects the strategies in architecture. A wide trench was dug to create the battlements. The main palace is covered with dense gardens on three sides. Now, in 1998 the part of fort was turned into a heritage hotel.

### **5. Rajghat –**

Located on the bank of ganga, multiple temples are located here. A special temple of lord hanuman which has 40 feet high statue of Hanuman is very popular here. It is located 61 KM towards East from District centre Bulandshahr.

### **6. Valipura –**

This beautiful site in bulandshahr is situated on the bank of local river Van Chetna Kendra ( forest life conciousness) and is managed by Government Forest Department. It is situated 4km away from Bulandshahr, can easily be reached by taxis.

**7. Narora –**

A nuclear power plant is located here, a barrage is made on river Ganga and several canals originate from this site. The view of Narora Dam is panoramic. It is a good picnic spot, and a big park is located here. It is located 65 km from bulandshahr.

Belon Temple is 5 kilometres from Narora. The nearest railway station is Rajghat Narora Railway station which is 5 kilometres from Narora. Gangetic Dolphins can be viewed on 160 kilometres stretch of the Ganges between Bijnor and Narora Barrage.

**8. Khurja –**

Khurja is located 17 Km. from Bulandshahr on GT road towards Aligarh and also known as pottery town. Khurja supplies a huge portion of the ceramics used in state and country, hence it is sometimes called The Ceramics City. Khurja is also famous for its special sweet, known as "khurchan" which is made up of sweet, condensed milk. Khurja is also a heritage site consisting of several buildings older than 100 year such as Lala Mewaram ka Kamra, Seth Gangaram Bhawan, the building of J.A.S. Inter college and some more.

**3.5 WETLANDS**

In the district of Bulandshahr, before the implementation of Namami Gange, river water run-off and depletion of ground water level was a source of major concern as this severely impacted the water bodies across the district. In addition to this, the discharge of untreated water in the river was also a major issue for the DGC. Traditional methods of farming were common among the native population which were damaging the soil and river health as it utilizes harmful pesticides and insecticides.

As part of its proactive plantation, the DGC of Bulandshahr identified 25 Ganga Upvans to be set up in Gram Panchayats across the district. Ganga Vans were established and declared Ramsar wetlands; giving this international importance for the conservation and sustainable use of wetlands. Also, Ganga Nurseries and Kisan Nurseries were established to provide a further boost to plantation. Involving farmers as a major stakeholder, 35,129 saplings were distributed to small and marginal farmers from these nurseries.

## 4 ACTION PLAN DEVELOPMENT

As is clear, Bulandshahr has a large number of people engaged in household industries etc. Also there are strong market situations, and higher credit-deposit ratio. It also boasts a strong agricultural base. These factors make secondary and tertiary activity promotion as key to the district. Hence any policy must successfully aid this sector to generate positive feedback in other sectors.

### 4.1 AGRICULTURE

At the moment, yields of Bulandshahr out do its peers from the state. Diversification and promotion of horticulture/agroforestry/ cash crops should be taken up. Awareness and outreach programs are needed to this end. Crops that can be utilized for further processing and industrial uses should be encouraged. Handholding in setting up such ventures is needed since they have a chance to succeed in the well-developed district market.

Products like Bamboo furniture; processed foods like honey, gud (jaggery), clothing, furniture, earthen utensils etc. should be procured for government buildings from the local producers.

Moreover, low risk taking capacity of marginal farmers must be enhanced. NABARD's self-help group bank link program (SBLP) can be vital here. Pooling of resources and risk would allow farmers to cultivate higher value producing crops. Lower value of product but at par yields point to the ripeness of community intervention.

Short run increase in earnings must not be at the cost of environmental and social concerns. For achieving the twin objective of sustainability and economic viability, certain behavioral changes must be encouraged and certain financial incentives must be offered. Unless the people on the ground do not understand the sustainability issues, and also do not see economic benefit the plans won't fructify.

Both micro finance initiatives and enviro conscious projects more often than not need strong organizations with a firm organizational belief. Organizations like ZBNF, Manuvikasa, Art of Living, Lok Bharti are the partners that will help us in the laying the foundations. Only after prolonged efforts will a trust for the products create markets demand. Till then the farmers need support. Microfinance and incentives under PKVY should be deployed generously in this regard.

Organic farming could be an economically viable option in the district if the govt protects their farm income, and. builds strong marketing networks linking farmers, processors and distributors with easy certification process and minimizing farmers' risk. This ongoing farming system generates negative externalities, which may to be estimated in monetary terms, and the equivalent amount of money may be transferred per hectare basis to the organic farming adopters. The Action Plan should focus on the following:

- Setting up a pilot project for small processing unit of organic raw sugar in a block where large number of organic sugarcane producers exists and marketing and branding it under Namami Gange Logo.

- District is leading livestock. Organic milk cooperative society can be set to sell the processed milk as Namami Gange brand.
- Organic meat processing unit as pilot can be set up.
- There is a need to link crop and horticulture with MGNREGA. Fifty percent wages of the MGNREGA workers can be paid by the farmers and 50% from MGNREGA funds.
- Development of local market for bio-inputs involving SHGs in bio-resource processing, packaging and marketing
- Short-term diploma course in organic farming
- Identification of marketing potential and strategies
- Integration of organic farming (crop + livestock) with bio-energy generation
- Organic and natural farming zones should be setting instead of clusters, which are not formed in true sense. Being in the NCR Delhi, the district has huge potential for organic vegetables production along the River Ganga.
- Organic honey project can also be launched.

## 4.2 FORESTRY

Agro forestry has the capability to increase earnings of marginal farmers, increase their quality of life (by providing services like medicinal plants, shade, timber, fodder, protection against erosion), while helping us create additional carbon sink.

Permit related confusion and hesitation to contact administration are major factors that prevent farmers from adopting agro forestry. Proper sales permit and informed choice of species can revitalize the timber markets of India and go a long way in improving economic conditions of Bulandshahr.

## 4.3 TOURISM AND WETLANDS

Tourism promotion needs primarily an information dissemination based initiative. Similarly, Wetland conservation needs people to know their fragility and threats. For spreading the information, a medium that has a great reach in the vernacular language and a lasting impact should be deployed. Media like Radio, social media are suitable.

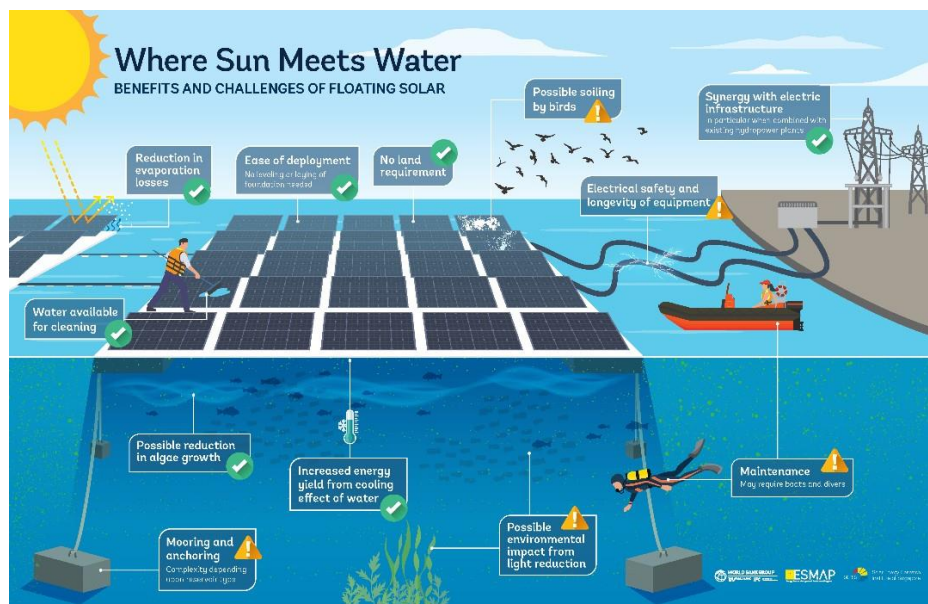
Apart from information dissemination, experiences should be developed that can attract more tourists. Water sports, bird watching, boating, diving etc. should be developed on wetlands. For religio-cultural tourism the cleanliness and transportation factors should be improved.

Unsustainable fishing has caused the fragile ecosystem a lot of damage. Fishing during mating season should be limited by local authorities by balancing livelihood with some alternate means. To this end, algal and aquatic weed based biomass can be utilized for fertilizer development/ biofuels (under NNBOMP scheme of MNRE) etc. Collection of these aquatic weeds and algal blooms can be taken up under MNREGA. This can be a great source of income diversification which can be provided to fisher folks.

## 4.4 ENERGY

### 4.4.1 Solar

Solar energy strategy for the city should be in-line with the National Solar Mission. Low hanging fruits in the mission are roof top solar electrification in all government buildings, cantonments, NGO offices etc. A potentially revolutionary idea could be floating solar power (already popular in UP's Rihand Dam). Smaller installations can improve fishing prospects, while generating electricity.



Other schemes like PM-KUSUM (for solar powered pumps), solar lighting etc. must be emphasized in order to satisfy the districts energy demands through off grid and connected solutions. Further employment opportunities can be generated through the Saurya Mitra Yojana, which provides for the skill training of solar operators and maintenance staff.

### 4.4.2 Biomass and Biogas

Biomass and Biogas potential should be further explored and incentivized. Also citizens should be encouraged to use biogas over biomass as fuel. New National Biogas and Organic Manure programme should be utilized here. Compressed Biogas is the natural progression from biomass and biogas. Some states like Gujrat and Maharashtra have done exceedingly well here.

Swachh Bharat Mission linked with large scale bio gas plants should be pursued aggressively to achieve twin benefits of clean energy and waste management. Existing incentives of using Biogas for energy consumption and automobile fuel under the SATAT Yojana (Sustainable Alternative Towards Affordable Transportation) can be touted as business opportunities.

## 4.5 INTERGRATED MODEL FRAMEWORK

1. Bulandshahr is very advanced in respect of industrial activities. Several hundred factories of pottery are working in Khurja city and its products are famous throughout the nation. District has several large and medium scale industries which mainly include sugar mill, distillery, paper mill, spinning mill synthetic yarn etc. Most of the workers are marginalized.

The challenge in this sector is the negative environmental externalities. Thus, to counter the negative externality, proper water treatment plants should be set up along with strict monitoring.

2. In the district, high livelihoods are still dependent on agriculture. Most of the them are marginal farmers. Enhancement and strengthening their life quality must be one of the key. The challenges in this sector are high water consumption, soil degradation, Fisheries has issues related to aquatic eco-system and water quality.

Thus, the solution could be:

- promotion of organic farming,
- Promotion of Horticulture and commercial plantations
- Revamping up of micro irrigation techniques.
- crop diversification particularly high value low water usage crops,
- appropriate breeds of fishes and regular cleaning of wetlands.

3. Renewable energy, clean and diverse biodiversity and dense forestry have a very high positive environmental impact. In Bulandshahr the area of forestry and production of renewable energy is very less. So, it becomes most critical category for conservation and long-term sustainability. The investment in this category should not be measured for return in short-term. This must also be taken up to balance some negative externalities for promoting livelihood and cleaning nearby atmosphere.



## 5 RECOMMENDATIONS

### 5.1 AGRICULTURE AND ALLIED SECTORS

- ✚ Paramparagat Krishi Vikas Yojana is already active in the district. Works already done herein should be expedited. The experiences of the farmers engaged here should be pleasant so that more farmers can be incentivized.
- ✚ Pradhan Mantri Matsya Sampada Yojana should be expedited. Fisheries can be boosted by rejuvenating traditional ponds under MNREGA scheme.
- ✚ Branding efforts under National Organic Foods Market (Jaivikkheti.in etc.) Listings products here gives a price increment. Farmers need to be informed regarding these opportunities.
- ✚ There is a huge scope for improving the livelihood of local people and regeneration of natural capital through the promotion of organic agriculture, horticulture Dairy, and agroforestry.
- ✚ The possibility of evolving an economically viable model of convergence of MGNREGA activities with the concerned line departments would be explored to promote HVCs, including vegetables, to improve the people's livelihood.
- ✚ Agriculture R&D and extension services need to be invigorated and oriented toward sustainable agricultural practices in the case of HVCs, horticulture, livestock and agroforestry.
- ✚ A three-tier framework of agro-processing (primary, secondary and tertiary processing) can be set up to reduce post-harvest losses and generate value addition and local employment.
- ✚ A new institutional framework needs to be set up at the district level where the concerned line departments' technical, human and financial resources may be pooled or converged together to provide customized solutions to the farmers related to technology, training, marketing needs and other needs advisory services.
- ✚ There are 7 Sugar Mills in the district but average distance from the village to the mills is 15-20 km which increased the cost and also damaged the rural roadway due to overloading.
- ✚ Basmati rice is cultivated in a large area of district Specially the Basmati- 1509. Shortage of packaging and seller units in the district has been observed.
- ✚ Organic farming (Jaibik Kheti) is done in the the district. Food outlets/ FPOs may be helpful for the marketing of the organic products.
- ✚ Vermi-compost is produced by the farmers using the animal excreta and Rs. 5000 per hectare is provided to the farmers for this which is not enough. Also training should be provided to the farmers to efficiently making vermi compost.
- ✚ Uncontrolled way of use chemical should be stopped. Like if the standard value is 2ml\hectare it is used 4-6 ml by the farmers which reduce the fertility of the land.
- ✚ Tulsi is cultivated in the area but there is no tulsi oil or its related extraction plant in the area.
- ✚ Flooding problem largely affect the production of vegetables.

- ✚ Weather advisory is given from KVK Bulandshahr but from Bijnor barrage and upper areas water is released without any information. Therefore, advisory of water release should be given to farmers beforehand.
- ✚ Farmers have large numbers of male calves which can be used for bullock carts or some semi-mechanical machinery for farming and transportation and some help will be provided to the farmers for using these environment friendly equipment.
- ✚ Major pests and disease of crops are white grub and top borer in sugarcane, Stem borer and blast in paddy, Stem borer in maize, termite problem in wheat & Paddy, fruit borer, late blight in Potato, leaf curl in tomato. Yello Mosaic Virus (YMV) in Urd and Moong which should be controlled by giving training to the farmers and using medicine.
- ✚ Electricity consumption for agriculture is continuously increased over the years which should be reduced by introducing other sources of energy such as solar energy.

## 5.2 FORESTRY

- ✚ Bamboo based industries are developing rapidly and government's National Bamboo Mission comes with great synergies for Arth Ganga.
- ✚ Flood prone areas should be considered for re-forestation and plantation as they serve twin benefit of flood control and economic benefit of the produce they may bear. National Afforestation Program. Compensatory afforestation can be explored under the scheme here
- ✚ E adhaar based portal to approve felling and selling permits of trees can revitalize the timber markets. This can not only help boost other industries, but also make plantation a hassle free event for farmers. Lack of transparency in permits, disincentivizes them.
- ✚ Training for selection of species and horticulture management would allow farmers to choose better. This can boost earnings for marginal farmers and should be taken up by local authorities and organisations like KVK.
- ✚ Watershed management programs should be revisited and their errors should be relooked at.

## 5.3 WETLAND AND TOURISM

- ✚ Tourism with Historical and religious significance should be revived; ideas like Mahabharata Circuit for tourism should be explored in Bulandshahr and surrounding places.
- ✚ Riverine weeds and algal bloom infestations reduce dissolved oxygen levels. Their impact on aquatic ecosystems is adverse and clearing them out is costly. MNREGA based work can be utilized here for clearing them out. The biomass collected can be utilized for bio fuel/ biomass/ fertilizers. These ideas should improve livelihood and provide alternatives to fishermen
- ✚ Information is most easily spread on social media; Short video format social media, along with Whatsapp are most prevalent among rural youth and should be leveraged. Information regarding wetland conservation, opportunities to explore them etc. should be highlighted actively

- ✦ Allowing for independent content creators to spread awareness; through a video making competition is easiest way to generate views and content at the same time. Youtubers and Social Media influencers should be contacted directly and made ambassadors for tourism.
- ✦ Bulandshahr is known for world famous Ceramics, of china clay. Ceramic industry can be promoted at markets in major tourist centers in Uttar Pradesh. Bulandshahr has potential to be developed exclusively as a ceramic and pottery market. There is a need to develop standard local markets to attract niche customers. The local ceramic and pottery market can be marketed and propagated through extensive modern advertisement and not just relying on word-of-mouth. International/National ceramic and pottery festivals can be organized to support local economy.
- ✦ Pottery industry and artisans can be motivated with running government projects and schemes to support and sustain this form of art.
- ✦ Private companies can be encouraged to import ceramic and pottery from native producers and sell them after refining and brand tag.
- ✦ Tourists are a source of income for the natives; developing local marketplaces such as specialized malls for locally made ceramic and pottery can give a place to sellers and buyers simultaneously. Usually local markets (selling authentic articles) are scattered throughout the city, a specialized marketplace will help the sellers to showcase their product at premium place and buyers to find a huge variety of range at the same place.
- ✦ Local producers can be trained to market their product using internet and social media. Lessons of Digital marketing can be helpful to the native ceramic and pottery.
- ✦ Regular maintenance of tourist spots along with the different roads connecting it with the center of the city is necessary to provide tourists with an enjoying experience.
- ✦ Information and contact details of authentic tourist guides on the government tourism website may be useful for tourists and encourage them to visit more places are eventually more business. Acquiring license by local tourist guides from government bodies is generally seen as complex process which discourage genuine candidate to get the license. Easy to apply and get the license can benefit the tourism.
- ✦ Also training sessions for guides can be beneficial for individual guides and help them earn livelihood and tourism sector to embrace more tourism. These training sessions can also be helpful in knowing the actual number of functional guides in the city. And the same information can be uploaded on the website for customer support.
- ✦ Supporting tourism can also help flourish other sectors such as local handicrafts, restaurants and eateries travel agencies local vendors and many more as all of these are in symbiotic relationship.
- ✦ Local foods can be promoted with tourism for an authentic tourism experience.
- ✦ Letting tourists know about/ Promoting community-based initiatives such as women led Self Help Groups, Social Enterprises will support the tourism as well as initiatives. As it can bring business to initiatives.
- ✦ Development of COVID 19 protocol friendly tourism packages to reboost the tourism sector economy after pandemic

## 5.4 ENERGY

- ✦ Implementing NNBOMP schemes in tandem with National horticulture mission and Nabard's SBLP will increase chances of its success. Biogas generation and Biomass have high synergies with Zero budget farming and Kamdhenu yojana.
- ✦ Project investment opportunities in large scale compressed Biogas plants with massive Central financial assistance and Grants;
- ✦ Improve solar electrification through aggressive roof top installations in all government buildings and business installations like petrol pumps, solar pumps etc.
- ✦ Explore floating solar installations in large wetland regions where synergies in fishing and energy production can be exploited.

## 6 Discussion during the Report Presentation

- Bulandshahar district comes under NCR – region and hence acts as a good market connectivity.
- Agriculture: There are 40 FPOs out of which 4 to 5 FPOs are involved in export of the produce. One FPO situated at the Ganga basin export their produce to Japan and Europe. Padmashree Bharat Bhushan Tyagi himself is devoted in promoting Organic Farming in the village Beehta. Organic Farming has been practiced in 200 Ha of land as targeted. Carrot (Yellow Carrot) being produced are being marketed to brands like Nestle and other five- star restaurants.
- Fisheries: Awareness and Trainings are being provided under Pradhan Mantri Matsya Sampada Yojana.
- Forest: Last Year Forest plantation was done in 300 Ha near Ganga Basin. This year a target of 100 Ha plantation is being taken up.
- There are 9 wetlands identified in 5- 10 Ha of area. The proposal has been sent to the Wetland department and the work will be taken up post approval. One biodiversity park has been provided by Namami Gange in Narora.
- Tourism: There are five resorts and two forts. One of the fort, “Kuchesar Fort” is famous for shooting and tourist footfalls. The challenge is the lack of linkage of these available infrastructure with Ganga. Hence, there is a great opportunity of development of Ganga Trails which will also increase the livelihood of the locals.
- The IIML Report for Arth Ganga should be a regular Agenda item for next 6-8 DGC meetings.
- Hon’ble PM during the post-Budget webinar on Tourism had spoken about market potential of destination weddings. It was suggested that suitable Ashrams in Ganga Basin may be identified for such purpose to promote blissful experience, cost reduction, livelihood opportunities and better upkeep.
- Allocate separate space for Namami Gange Awareness and Jalaj Marketing kiosk in Melas/Congregatios/Fairs for providing better marketing opportunities to the Jalaj products.
- As Dilli Haat Centre – Namami Gange Awareness and Marketing Centre – is being launched soon, it was requested that every district to identify niche products with a creative story and link it with Jalaj in their area
- To identify Arth Ganga Tourist Trails and organize Ganga Guide training
- Promotion of Natural Farming in Ganga Basin and training workshops should be organized on a regular basis. NMCG is supporting this initiative in coordination with MoA& FW and NCOF.
- Make plans for reuse of treated waste water for agriculture, industrial etc. purpose and also the sludge.
- Training of volunteers for Ganga awareness & Aarti workshops to promote regular aartis on Ghats.

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## 8 APPENDICES

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