Arth Ganga Project: District Rae Bareilly

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EXECUTIVE SUMMARY

Raebareli, an agrarian district of the state of Uttar Pradesh was established by the British government. The district lies in the Gangetic plains and is situated at the banks of river Sai.

The total geographical area of the district is 4043 Km^2, out of this area, the total cultivable land is 268071 ha, the permanent pastures are 2805 ha, the Cultivable wasteland is 13952 ha. The barren and uncultivable land constitutes 8956 ha. Majorly based on different characteristics soil types Ganga Khadar, Ganga Recent Alluvium, Ganga Flat, Sai Upland, Sai Low Land, and Sai Flat. Based on soils and topography, the district is divided into six Agro-ecological situations. With the net sown area of 184500 ha and gross cropped area of 286100 ha, the Cropping intensity of the district is 155.09%. The net irrigated area is 161100 whereas the rainfed area is 23400 ha. The district's percentage of the net and gross irrigated areas have shown consistency over the years, with an average of 89.52% and 87.45%, respectively. The share of cultivable wasteland and barren and uncultivable land increased from 3.65% to 4.16% and from 2.85% to 3.44% respectively, during 2010-18. The share of area under trees and gardens decreased from 3.90% in 2010-11 to 2.34% in 2017-18. The current and other fallow land has also increased over the years and the area for non-agricultural use decreased over the period from 12.10% to 10.61%. The major farming system is divided into Pure cropping, Mixed farming, Agri-Horti, and Agri-Silvi. The rice-wheat cropping system is prevalent with Dhaincha The major crops types are wheat, rice, groundnut, pulses, potato, etc. The livestock consists of cattle, goats, buffalos, etc. In 2017-18, however, the nitrogen share decreased to 69.99%, while the phosphorus share increased to 26.82%, and the potassium share decreased to 3.20%. The overall use of chemical fertilizers has reduced in the district from 231.61 kg/ ha GSA in 2010-11 to 118.19 kg/ ha GSA in 2016-17.

The total forest cover of the district is only 93.54 km^2. Out of total forest cover, the maximum area is covered by Open Forest (89.54%) followed by Moderately dense forest (4%). A total of 53 plant species from 36 families were found in both the captive and wild states. The share of the forest area has decreased from 1.84% in 2010-11 to 1.22% in 2017-18. The six interconnected lakes of Samaspur Bird Sanctuary count for, over 75,000 birds, with over 250 permanent and migratory species and Indira Gandhi Memorial Botanical Garden consists of medicinal plant/ herbs trails (consist of 114 plants of 23 medicinal species). The district comprises small and medium-sized wetlands (3039) mostly are waterlogged and lake/ponds/tanks. The wetland size is in general. The number of natural wetlands is more than man-made The wetland is home to at least 46 freshwater fish species. The district is well-connected to other parts with help of roads, rails, and airways. There are few places in the city whereas in neighboring places that attract thousands of visitors. Dalmau, a place of historical importance has a fort, etc., Indira Gandhi Memorial Botanical Garden, etc. are places of tourist interest. The number of tourists has increased from 2015 up to 2019 with the highest increase in 2018, this significant increase is more for domestic tourists.

The main source of lightning is kerosene (58.98%) followed by electricity (40.34%) closely while only 0.24% is the usage of Solar energy. Electricity consumption in agriculture has increased significantly from 203.22 kWh in 2014-15 to 269.19 kWh in 2019-20. The main fuel source is firewood (77.27%) followed by LPG/PNG (10.59%), which is very low in the district thus, the government should indulge and encourage people to use green resources. There is a high amount of biomass production in the district. Biomass gasifiers, a co-generation power plant, etc. have been installed in the district. Biogas potential from animal and agricultural waste calculated approximately as 2 crores m^3/year and 26 crores m^3/year respectively, shows this high amount of biogas can reduce pollution and promote economic growth in the district. No hydropower plant exists in the district nor there are any proposed projects for the future.

The district needs measures related to enhanced use of renewable energy along with creating awareness about various schemes. Promoting eco-tourism, sustainable tourism, maintenance and monitoring of forests and structures, agroforestry, etc. The district needs to focus on increasing salt-tolerant varieties, micro-irrigation, growing medicinal plants or mushroom cultivation or amla, etc. Advanced mechanized tools, growing flowers, beekeeping, Sericulture, dairy processes, etc. are some of the adaptations that need to be encouraged.

1 DISTRICT OVERVIEW

1.1 INTRODUCTION

Rae Bareli is a district of Uttar Pradesh with its administrative headquarters located Rae Bareli. Geographically the district lies at 26º23' N latitude, 81º23' E longitude and 120 m altitude. In the year 2019, there was a total 2.03% forest area of the total geographical area. The district encompasses a geographical area of 4609 sq kms. And in terms of geographical area it occupies the rank of 10th in the state and 243rd in India.

Administration wise, the district is divided into 5 tehsils namely, Rae Bareli, Lalganj, Dalmau, Unchahar, and Maharajganj. There is 1 Lok Sabha seat and 5 Assembly constituencies in the district. Moreover, the district comprises 7 sub-districts, 9 towns and 1773 villages.

According to 2011 census, the district has a population of 3405559. In the total population of the district of Rae Bareli as much as 35.37 percent are workers and rest of 64.63% are non-workers. Among workers 18.94percent are main workers and rest of 16.44 percent are marginal workers of total population. The extent of workers in rural parts and non-workers in urban parts is higher. In the district among workers 26.30 percent are cultivators and 26.49 percent other workers.

Agriculture is the backbone of the economy of the district. Some of its chief agricultural products are rice, pulse, wheat, barley, millet, poppy, etc. Most of the population of the district is engaged in agriculture since it is scantily industrialized. Only a few industries like Indian

Telephone Industries, Shri Bhawani Paper Mills Limited, Nandganj Sirohi Sugar Mill, Feroz Gandhi Thermal Power Project, Birla Cement Factory etc.

The district has a forest cover of 2.03% of the total geographical area. Under social forestry schemes, fruit and non-fruit bearing trees have been planted along road sides. The important trees are Dhak, Khair, Babul, Mahua, Sheesham, Neem, Kanji, Siras, Eucalyptus, Mango and Jamun. Groves in the district are mostly of mango and mahua.

Figure 1 Map of the district

1.2 DEMOGRAPHIC PROFILE OF RAE BAREILLY

2 Geographical Area: 4043 Sq. Km.

3 Administrative Divisions:[1]

District Headquarters: Raebareli

No of Municipalities: 9

No of Tehsil: 6

No of Blocks: 18

[1] https://raebareli.nic.in/

No of Gram panchayats: 989

No. of Nyay Panchayats: 155

No. Of Villages: 1574

4 Demographic and socio-economic indicators:[2]

Population: 34,05,559 (Census 2011)

Population density (Total persons per sq. km): 739

Sex ratio: 943

Literacy: 67.3%

- Occupation/ other Livelihood source: Agricultural Business
- Major Rivers: Ganga & Sai
- Forest Area: 93.54 Sq. Km.

4.1 AGRO CLIMATIC PROFILE OF THE DISTRICT

4.2 ECONOMIC PROFILE OF RAE BAREILLY

[2] https://www.censusindia.gov.in/2011census/dchb/DCHB_A/09/0927_PART_A_DCHB_RAE%20BARELI.pdf

5 QUANTITATIVE DATA ANALYSIS

2.1 Agriculture and Allied Activities

2.1.1 Trend in Land Use Pattern

The total declared area of the district is 3920.45 sq. km². The share of the forest area has decreased from 1.84% in 2010-11 to 1.22% of the total reported area in 2017-18. The share of cultivable wasteland increased from 3.65% in 2010-11 to 4.16% in 2017-18, which is not a good development indicator. Barren and uncultivable land share has also increased from 2.85% in 2010-11 to 3.44% in 2017-18. The share of area under trees and gardens decreased from 3.90% in 2010-11 to 2.34% in 2017-18. The current and other fallow land has also increased over the years, which is not good for the district economy. The net sown area has remained constant over the years (around 57.18%). The area for non-agricultural use decreased over the period from 12.10% to 10.61% (Table 4). Overall, the land use pattern shows that the fallow and uncultivable land area has increased over the years while the net sown area has almost remained constant. The area under agricultural use has increased.

Table 4: Trends in Land-use Pattern in Raebareli (as % of the 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	Pasture land	Area under trees and gardens	Net Sown Area
1	2	3	4	5	6	7	8	9	10	11
2010-11	393609	1.84	3.65	11.28	6.19	2.85	12.10	0.82	3.90	57.38
2011-12	323236	1.24	4.32	11.98	5.96	2.77	12.19	0.87	3.61	57.08
2012-13	323236	1.24	3.84	11.81	6.32	3.02	11.95	0.88	3.80	57.15
2013-14	392045	1.02	4.16	12.50	7.10	3.49	10.06	0.85	3.60	57.22
2014-15	397562	1.21	4.35	12.73	7.59	3.44	9.93	0.84	2.89	57.02
2015-16	392045	1.22	4.41	9.65	9.15	3.48	10.45	0.85	2.95	57.82
2016-17	392045	1.22	4.16	12.00	8.21	3.45	10.54	0.85	2.31	57.24
2017-18	392045	1.22	4.16	11.23	8.97	3.44	10.61	0.83	2.34	57.18

Source: Compiled from http://updes.up.nic.in/spiderreports/intialisePage.action
And District-wise Development Indicators file.

2.1.2 Trends in Operational Land Holdings

In Raebareli district, the total number of operational farms increased from 312 thousand in 2010-11 to 454 thousand in 2015-16, a net increase of 45.51%. While in the state, their numbers increased from 23,325 thousand in 2010-11 to 23822 thousand in 2015-16, a net increase of 2.13%. Most land positions in the district are marginal and small. These two size categories represented around 95.83% in the district in 2015-16, while the corresponding proportion in the state was 92.81% (Table 5). The two agricultural censuses of 2010-11 and 2015-16 report no significant change in the percentage share across the various categories of landholdings. Marginal land holdings increased in 2015-16.

Table 5: Distribution of Operational Holdings by Size-categories of farms (in %) in Raebareli

	Agri, Census	Marginal Holdings (0-1 ha)	Small Holdings (1-2 ha)	Semi-Medium Holdings (2-4 ha)	Medium Holdings (4-10 ha)	Large Holdings (10 & above, ha)	Total Holdings ('000 No.)
Raebareli	2010-11	83.89	11.03	4.23	0.81	0.03	312
	2015-16	85.61	10.22	3.50	0.66	0.02	454
							[45.51]
Uttar Pradesh	2010-11	79.45	13.01	5.72	1.71	0.11	23325
	2015-16	80.18	12.63	5.51	1.58	0.1	23822
							[2.13]

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

2.1.3. Trends in Area, Production, and Yield of Principal Crops

i- The Trend in Cropping Patterns

Rice and Wheat dominate the agriculture of the district. Table 6 shows the area devoted to various crops over the last eight years. In 2017-18, wheat made up the highest share of GCA (46.71%), followed by Rice (32.98%) and Urad (4.30%). These three crops constitute around 84% of the GCA. The area shared by the total cereals has remained consistent over the years (average, 78.96%). The main pulses produced are Urad, Chickpeas, and Arhar, while the rest of the pulses are not significantly produced. The total pulse acreage has decreased from 8.29% in 2010-11 to 7.73% in 2017-18. Thus, the food grains cover a majority (average, 87.49%) of the GCA. Mustard is the only major oilseeds crop produced, and the total oilseed acreage has remained consistent over the years (average, 3.29%). The area under Potato has also remained consistent over the years

(average, 1.33%). However, the area under Sugarcane has decreased over the years. However, it is very important for the welfare of farmers to increase the area under them as both of them are high-value crops. In general, there is no significant change in the cultivation pattern reported in the district during the study period, except that the net sown area has decreased over the years, from 63.70% in 2010-11 to 60.35% in 2017-18. The average cropping intensity reported in the district is 160.62

Table 6: Trends in Cropping Pattern (as % GSA) and Cropping Intensity

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	23.44	29.93	30.90	32.87	33.26	33.11	33.17	32.98
Wheat	36.73	45.96	46.13	46.02	47.01	46.89	46.98	46.71
Jawar	1.98	2.37	2.26	1.62	1.26	1.25	1.25	1.25
Other Cereals	0.88	1.09	1.04	0.94	0.68	0.58	0.58	0.57
Total Cereals	63.02	79.34	80.31	81.45	82.21	81.82	81.98	81.51
Urad	4.13	5.25	4.88	4.56	4.34	4.32	4.32	4.30
Chana	1.65	2.01	1.92	1.37	1.06	1.06	1.06	1.05
Arhar	1.65	2.01	1.92	1.37	1.06	1.06	1.06	1.05
Other Pulses	0.88	1.15	1.05	1.06	0.90	0.90	0.90	0.90
Total Pulses	8.29	10.27	9.93	8.71	7.80	7.76	7.78	7.73
Total Foodgrains	71.31	89.61	90.24	90.16	90.01	89.59	89.76	89.25
Mustard	1.80	2.13	2.27	2.02	1.92	1.91	1.91	1.90
Other Oilseeds	1.12	1.44	1.44	1.23	1.31	1.30	1.31	1.30
Total Oilseeds	2.92	3.57	3.71	3.26	3.23	3.22	3.22	3.20
Sugarcane	0.68	0.85	0.86	0.65	0.47	0.47	0.47	0.47
Potato	1.19	1.28	1.41	1.40	1.35	1.34	1.35	1.34
Net Sown Area	63.70	64.48	64.54	61.75	61.54	61.25	60.76	60.35
Gross Sown Area (in 1000 Ha)	354.56	286.12	286.21	363.24	368.32	370.05	369.35	371.48
Cropping Intensity	156.99	155.09	154.93	161.94	162.49	163.25	164.59	165.71

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

ii- Trends in per hectare yield of principal crops

Table 7 shows that the yield per hectare of most crops varies from year to year. However, the yield for most of the major crops has decreased in the latter years of the study. This can be due to adverse

weather conditions along with the non-availability of better infrastructure. This is a cause of concern as such patterns are not observed in other districts. Wheat and Rice are the major crops in the district, and their per hectare yield (25.65 qtls and 18.16 qtls respectively, in 2017-18) are also high. Per hectare yield of total cereals has decreased from 24.16 qtls in 2010-11 to 22.37 qtls in 2017.18. Similarly, per hectare yield of total pulses decreased from 6.20 qtls in 2010-11 to 5.88 qtls in 2017-18. However, the yield of Pulses is less than that of cereals, following which the total production of pulses is less. The yield of total oilseeds has decreased from 6.62 qtls in 2010-11 to 6.37 qtls in 2017-18. This can be due to the non-availability of hybrid seeds in the district. However, the fall in yield of most of the crops is not uniform. In some years, it has increased as well, but on average, the yield has fallen in the latter years of the study. The average yield of Sugarcane was only 612.49 qtls/ha. Similarly, the yield of Potato is also very high, average, 139.76. In summary, all crop yields show year-over-year fluctuations, with the lowest in 2014-15. The lack of homogeneity of yields makes farmers' income riskier and more unstable, requiring a solid insurance protection measure.

Table 7: Trends in Per Hectare Yield of Principal Crops in Raebareli District (Qtls)

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	21.36	22.70	24.21	24.57	23.38	20.20	17.79	18.16
Wheat	26.99	28.72	29.66	28.38	16.19	19.02	25.25	25.65
Jawar	8.75	8.43	9.85	8.57	7.23	5.88	8.16	9.86
Total Cereal	24.16	25.72	26.83	26.38	18.94	19.23	22.18	22.37
Urad	4.72	4.52	4.46	3.59	2.33	1.91	2.91	2.72
Chana	6.27	12.59	12.19	5.25	1.89	0.46	12.61	9.05
Arhar	6.56	7.63	7.86	6.42	2.78	3.81	8.96	10.87
Total Pulses	6.20	7.18	7.01	4.87	2.87	2.78	6.34	5.88
Total Food Grains	22.07	23.59	24.65	24.30	17.54	17.80	20.81	20.94
Mustard	7.39	8.58	10.43	7.57	6.03	3.76	6.46	7.16
Total Oilseeds	6.62	6.73	7.64	5.47	4.57	4.77	5.64	6.37
Sugarcane	442.32	513.96	515.32	532.12	543.44	528.70	1104.50	719.60
Potato	173.61	128.47	174.84	99.82	138.54	131.38	137.82	133.56

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

iii- Trends in Production of Principal Crops

Table 8 shows the trends in the production of the main crops over the years. Rice and Wheat, dominate the production. In 2017-18, Rice (222.46 thousand tonnes) and wheat (444.98 thousand tonnes) formed a major part of the total cereal production (677.41 thousand tonnes). Coming to pulses, Urad, Chickpeas, and Arhar occupied the highest production. Urad has a production of 4.34

thousand tons, Chickpeas has a production of 5.0 thousand tons, and Arhar had a production of 4.26 thousand tons in 2017-18. Although there has been a significant variation in the production of these pulses over the years, they still represent around 80% of the total pulse production. Mustard production was 5.06 thousand tons, which represented around 66% of the total oilseed production in 2017-18. Sugarcane production was 124.56 thousand tons in 2017-18. Potato production has also been significant over the years (66.37 thousand tons in 2017-18). Looking at the annual production data of various crops, we find that their production has increased on average during the period, but at the same time fluctuates year to year, partly due to weather changes and partly due to market conditions. Proper insurance arrangements are the need of the hour to get assured income and take more risk and diversify their production.

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

Crop/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	177.47	194.36	214.05	293.36	286.48	247.54	217.94	222.46
Wheat	351.47	377.62	391.58	474.47	280.32	329.96	438.20	444.98
Jawar	6.13	5.71	6.36	5.05	3.35	2.72	3.78	4.57
Other Cereals	4.77	6.14	4.81	7.59	3.25	1.98	11.69	5.40
Total Cereals	539.84	583.82	616.80	780.47	573.40	582.20	671.61	677.41
Urad	6.92	6.79	6.23	5.94	3.72	3.05	4.65	4.34
Chana	3.61	6.71	7.28	3.28	1.05	0.26	6.96	5.00
Arhar	3.85	4.40	4.31	3.20	1.09	1.49	3.51	4.26
Other Pulses	3.84	3.21	2.10	2.99	2.39	3.19	3.09	3.30
Total Pulses	18.21	21.10	19.92	15.40	8.24	7.99	18.22	16.90
Total Foodgrains	558.05	604.92	636.72	795.87	581.64	590.19	689.83	694.31
Mustard	4.71	5.23	6.76	5.57	4.27	2.66	4.57	5.06
Other Oilseeds	2.14	1.65	1.35	0.90	1.17	3.02	2.14	2.51
Total Oilseeds	6.84	6.87	8.11	6.47	5.43	5.68	6.71	7.58
Sugarcane	107.04	125.30	126.46	125.21	94.07	91.52	191.19	124.56
Potato	73.11	46.94	70.58	50.81	68.84	65.29	68.49	66.37

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

iv- Variability assessment in the area, production, and yield

To understand the variability across the years (Table 9), we calculated the mean, standard deviation (SD), and coefficient of variation (COV) of the area, production, and yield of the main crops. Among the different crops, the lowest variability is observed in Chickpeas (5.33%), followed by Urad (5.62%) and Mustard (6.51%), and the highest in Jawar (19.05%). The variability in the area under total pulses (3.56%) is less than the variability in the area under total cereals (14.17%). Since

Rice and wheat dominate the production, the variability in the area under total food grains is, therefore, also relatively high (12.82%).

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

	Area (1000 Ha)			Production (1000 Ha)			Yield (Qtl./Ha)		
Crop/Year	**Average**	**SD**	**COV**	**Average**	**SD**	**COV**	**Average**	**SD**	**COV**
Rice	108.33	18.80	17.36	231.71	41.36	17.85	21.55	2.63	12.20
Wheat	156.82	21.29	13.58	386.08	65.06	16.85	24.98	4.85	19.43
Jawar	5.58	1.06	19.05	4.71	1.34	28.42	8.34	1.32	15.78
Total Cereal	273.42	38.73	14.17	628.19	77.94	12.41	23.23	3.08	13.24
Urad	15.51	0.87	5.62	5.20	1.46	28.06	3.39	1.08	31.94
Chana	5.67	0.30	5.33	4.27	2.69	63.08	7.54	4.84	64.19
Arhar	4.72	0.90	19.02	3.26	1.29	39.52	6.86	2.63	38.29
Total Pulses	29.22	1.04	3.56	15.75	5.02	31.86	5.39	1.73	32.19
Total Food Grains	302.64	38.81	12.82	643.94	78.78	12.23	21.46	2.74	12.77
Mustard	6.82	0.44	6.51	4.85	1.17	24.14	7.17	1.94	26.99
Total Oilseeds	11.32	0.78	6.89	6.71	0.89	13.22	5.97	1.05	17.57
Sugarcane	2.07	0.37	17.72	123.17	31.07	25.22	612.49	213.78	34.90
Potato	4.61	0.55	12.02	63.80	9.57	15.01	139.76	24.53	17.55

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

The variability of production depends on the variability of the cultivated area and the variability of the yield. Therefore, the variability in the production of different crops is greater than in the cultivated area of all crops. The highest variability in production is observed in Chickpeas (63.08%), followed by Arhar (39.52%), Jawar (28.42%), Urad (28.06%), and Mustard (24.14%). High variation in the production of pulses and oilseeds is partly due to variation in the land area under them and partly due to the high rate of seeds and non-availability of hybrid seeds. Improvement in crop insurance conditions and better market accessibility can lower this variation. Variability is lowest in Potato (15.01%), followed by wheat (16.85 %) and Rice (17.85%).

In the case of yield, the greatest variability is estimated in chickpeas (64.19%), Arhar (38.29%), and sugarcane (34.90%). Yield variability in total cereals (13.24%) and total food grains (12.77%) is lower as compared to that in total pulses (32.19%). Rice, Wheat, and Potato are the most consistent crops over the years. Several factors, such as climate change, market prices, rainfall patterns, etc., influence the variability in agricultural production.

2.1.4. Trends in Value of Product of Major Crops

Table 10 compares the share of the main crops in the total GCA and their share in the total value of agricultural output (VOP). It is significant to note that total pulses and total oilseeds have a relatively larger share in GCA than their share in VOP, while total cereals, total Foodgrains, Potato, and sugarcane have, on average, a greater share in VOP than GCA. Raebareli is mainly a food grain production district; therefore, food grains account for around 87.49% of the gross area of the crops. Similarly, total foodgrains account for nearly 90.43% of the total value of the agricultural product. Three crops - wheat, paddy, and Potato together accounted for, on average, around 77.84% of GCA and 86.71% of the total VOP. Overall, the total agricultural GCA has increased in the latter years of the study (average, 346.17 thousand hectares). The total value of the product has also increased significantly, that is, 863.72 Cr. Rs.) in 2010-11 to 1436.14 Cr. Rs in 2017-18.

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

Crop	% Share in	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Wheat	GCA	36.73	45.96	46.13	46.02	47.01	46.89	46.98	46.71
	VOP	45.62	44.54	48.25	48.42	37.41	44.87	50.10	51.12
Paddy	GCA	23.44	29.93	30.90	32.87	33.26	33.11	33.17	32.98
	VOP	32.05	33.76	33.65	35.22	47.22	42.95	31.79	31.75
Total Cereals	GCA	63.02	79.34	80.31	81.45	82.21	81.82	81.98	81.51
	VOP	78.94	79.65	82.99	85.68	85.90	88.31	83.34	83.80
Total Pulses	GCA	8.29	10.27	9.93	8.71	7.80	7.76	7.78	7.73
	VOP	9.82	10.67	7.81	5.39	3.68	3.46	7.17	6.85
Total Food Grains	GCA	71.31	89.61	90.24	90.16	90.01	89.59	89.76	89.25
	VOP	88.77	90.32	90.79	91.07	89.58	91.77	90.51	90.65
Total Oilseeds	GCA	2.92	3.57	3.71	3.26	3.23	3.22	3.22	3.20
	VOP	2.66	2.61	2.38	1.42	1.66	1.94	1.86	2.20
Potato	GCA	1.19	1.28	1.41	1.40	1.35	1.34	1.35	1.34
	VOP	5.62	3.58	3.78	4.88	5.99	3.86	3.40	3.84
Sugarcane	GCA	0.68	0.85	0.86	0.65	0.47	0.47	0.47	0.47
	VOP	2.91	3.46	3.01	2.63	2.77	2.40	4.22	3.30
Paddy + wheat + potato	GCA	61.35	77.16	78.43	80.29	81.62	81.34	81.49	81.03
	VOP	83.29	81.87	85.69	88.52	90.62	91.68	85.29	86.71
Total Agriculture	GCA (1000 Ha)	354.56	286.12	286.21	363.24	368.32	370.05	369.35	371.48
	VOP (in Cr Rs)	863.72	852.15	1176.69	1665.89	1189.21	1066.24	1268.36	1436.14

Per Worker VOP (Rs.1000 at current prices) in **Raebareli**	-	-	-	-	-	-	-	-
Per Worker VOP (Rs.1000 at current prices) in **UP**	-	40.66	48.69	52.50	52.11	56.48	61.97	69.69
Source: http://updes.up.nic.in/spiderreports/intialisePage.action And District-wise Indicator reports								

(Note: Per worker VOP data is not available for Raebareli.)

2.1.5. Consumption of Chemical Fertilizers

Table 11 shows the trends in the use of chemical fertilizers in agriculture. The recommended nitrogen to phosphorus and potassium ratio is 4:2:1, which is not maintained in the district. For example, in 2010-11, nitrogen represented 71.03% of the total fertilizers used, while the proportions of phosphorus and potassium were 23.89% and 5.08%, respectively. In 2017-18, however, the nitrogen share decreased to 69.99%, while the phosphorus share increased to 26.82%, and the potassium share decreased to 3.20%. The use of nitrogen is more than the recommended ratio, while that of the Phosphorous and potassium is less than the recommended ratio. The table also shows that fertilizer consumption varies from year to year, which can be due to several factors, including rainfall patterns, cultivation patterns, etc. Although the overall use of chemical fertilizers has reduced in the district from 231.61 kg/ ha GSA in 2010-11 to 118.19 kg/ ha GSA in 2016-17, but still the authorities can take steps to further reduce their consumption as chemicalization of agriculture degrades soils and water resources, requiring the use of organic fertilizers and biofertilizers.

Table 11: Trends in Use of Chemical Fertilizers in Agriculture (Kgs/per ha GSA)

Fertilizer/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Nitrogen	164.52	143.39	133.69	83.88	88.16	81.21	80.18	171.20
Phosphorous	55.32	37.19	43.94	21.54	25.45	30.43	31.43	65.61
Potassium	11.77	3.67	4.56	2.95	5.21	5.59	6.59	7.82
Total	231.61	184.26	182.20	108.37	118.82	117.24	118.19	244.60
Gross Sown Area (Ha)	354562	286116	286214	363241	368323	370049	369349	371477
Source: http://updes.up.nic.in/spiderreports/intialisePage.action								

2.1.6. Irrigation Structure and Status

i- Types of Irrigation systems

The types of irrigation systems and the percentage of the net and gross irrigated area to the net and gross cropped area, respectively, are described in table 12. The length of the canal has increased

from 1894 kms in 2010-11 to 2283 kms in 2018-19. The number of wells increased from 849 in 2010-11 to 5229 in 2018-19. The number of Government tube wells increased from 258 in 2010-11 to 392 in 2018-19. Shallow, medium, and deep tube wells increased by 44.5%, 88.69%, and 14.28%, respectively, in 2018-19 compared to 2010-11. The district's percentage of the net and gross irrigated areas have shown consistency over the years, with an average of 89.52% and 87.45%, respectively.

Table 12: Types of Irrigation Systems and percentage of the net and gross Irrigated Area

Name/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Length of Canal (KM)	1894	1894	1894	2300	2283	2283	2283	2283	2283
No. of Govt. Tube wells	258	273	273	387	380	392	392	392	392
No. of Wells	849	849	849	849	849	5229	5229	5229	5229
Shallow Tube well	60213	61453	62124	75434	86116	86472	86699	87008	87008
Medium Tube well	1796	2271	2501	3071	3299	3202	3256	3389	3389
Deep Tubewell	7	7	7	7	8	8	8	8	8
% Of NIA	87.80	87.31	87.18	90.86	91.20	90.55	90.65	90.64	-
% Of GIA	85.03	85.01	85.15	88.06	88.66	89.24	89.23	89.21	-

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

ii- Source wise area under irrigation

Canals and groundwater (GW) are the main irrigation sources in the district. The canal's share in the NIA (average, 38.95%) and the share of wells and tube wells in NIA (average, 61.02%) have remained consistent over the years. This shows the increased dependency of the district on the ground water for irrigation purposes, and it can have serious environmental issues if such a pattern continues in the long run.

Table 13: Source-wise Area under Irrigation in Raebareli (in %)

Source/Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Canal (surface Irri.)	39.60	41.42	38.28	40.36	37.55	36.13	39.14	39.11
Wells And Tube-wells (GW Irri.)	60.35	58.55	61.63	59.62	62.43	63.86	60.85	60.88
Others	0.06	0.03	0.08	0.02	0.02	0.01	0.01	0.01
NIA (1000 ha)	198.29	161.08	161.05	203.81	206.73	205.24	203.41	203.20

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

iii- Crop wise irrigated area

Table 14 shows that a majority area under Rice (average, 100%), wheat (average, 99.91%), Potato (average, 100%), and Sugarcane (average, 100%) is irrigated. Percentages of the irrigated area under pulses (average, 13.59%) and oilseeds (average, 59.09%) are relatively less.

Table 14: Trends in Crop-wise Irrigated Area in Raebareli (as % of the cropped area)								
Crop/Year	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Rice	100	100	100	100	100	100	100	100
Wheat	99.98	99.98	99.98	99.99	100	99.79	99.79	99.79
Total Cereal	95.99	96.17	96.47	97.47	98.07	98.07	98.07	98.07
Total Pulses	12.90	13.67	8.77	15.11	14.58	14.58	14.58	14.58
Total Foodgrains	86.33	86.71	86.82	89.51	90.83	90.83	90.83	90.83
Total Oilseeds	57.96	57.51	59.63	61.48	59.04	59.04	59.04	59.04
Sugarcane	100	100	100	100	100	100	100	100
Potato	100	100	100	100	100	100	100	100
Source: http://updes.up.nic.in/spiderreports/intialisePage.action								

2.1.7. Electricity Consumption in Agriculture

Electricity is one of the main energy sources used in agriculture. Table 15 shows that per capita electricity consumption in agriculture has increased significantly from 203.22 KWH in 2014-15 to 269.19 KWH in 2019-20, a net increase of approximately 32.46%. This is a cause of concern as this can result in an increased burden on non-renewable resources and create waste disposal problems. The percentage share of the agriculture sector (average, 24.36%) in the total electricity consumption in the district is quite significant. This indicates the heavy usage of electricity by agricultural farmers. Since electricity consumption has increased over the years, it is very important for the authorities to switch to more sustainable modes of electricity production, such as solar panels.

Table 15: Trends of Electricity consumption in Agriculture						
Division/ Year	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Per Capita electricity consumption (KWH)	203.22	154.03	264.26	280.13	272.96	269.19
% of electricity consumed in Agriculture sector to total consumption	25.44	28.88	22.19	22.85	20.66	26.15
Source: District-wise Development Indicators file						

2.1.8.Status of Agriculture Market

Table 16 shows the marketing infrastructure in the district. It has four main markets and twelve sub-markets. The total number of markets has increased from 13 in 2013-14 to 16 in 2019-20. The number of regulated mandis per lakh hectare of Net area sown has increased from 5.8 in 2013-14 to 6.62 in 2018-19, but the increase could have been more significant as it is very important to increase the number of regulated mandis so that farmers are able to sell their products efficiently.

Table 16: Status of Agriculture Markets in Raebareli							
Category/Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Main Markets (No.)	3	3	2	4	4	4	4
Submarkets (No.)	10	10	11	12	12	12	12
Total Markets (No.)	13	13	13	16	16	16	16
No. of Regulated mandis per lakh Ha. of net area sown	5.8	3.83	-	1.78	1.78	6.62	-
Source: District-wise Development Indicators file and District-wise Statistical Report							

2.1.9. 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 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 for the yield losses and motivate them to do organic farming. There is a need to set up an integrated processing unit for organic products. Monitoring of the project should be periodically done through MIS, Geo-tagging, and monthly physical and financial reports.

However, the policy-related issue is what would be after the three years? Will the government protect their income? There may be a possibility that the beneficiary farmers may revert to conventional farming in the absence of the regulatory framework. 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 to 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. 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.

Table 17 shows the details of the establishment of organic clusters under the Paramparagat Krishi Vikas Yojana and the Namami Gange schemes in the district. The district has 49 groups in fifteen development blocks. The highest number of groups are in Sareni (13), Dalmau (9), followed

by Deenshah Gaura (7) and Unchahar (7). Together, these four blocks constitute around 73% of the total number of organic clusters in the district. Significantly high variation can be seen in the number of farmers per group in the district. It is reported that the maximum limit of land under a cluster per farmer is 2.00 hectares. Hence, the majority of the beneficiary farmers are small and marginal. Only Sarani has only one organic group under the Namami Gange scheme. More work needs to be done to set up organic clusters under the Namami Gange scheme in different blocks.

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

S. No.	Block	Scheme	No. of groups	No. of farmers in groups			
				Total	Average	Median	SD
1	Amawan	PKVY	1	40	40	40	0
2	Chhatoh	PKVY	1	28	28	28	0
3	Dalmau	PKVY	9	234	26	27	5.83
4	Deenshah Gaura	PKVY	7	211	30.14	30	2.79
5	Dih	PKVY	1	31	31	31	0
6	Harchandpur	PKVY	1	34	34	34	0
7	Jagatpur	PKVY	1	30	30	30	0
8	Khiron	PKVY	1	25	25	25	0
9	Lalganj	PKVY	3	57	19	20	10.53
10	Maharajganj	PKVY	1	32	32	32	0
11	Rahi	PKVY	1	27	27	27	0
12	Rohania	PKVY	1	28	28	28	0
13	Sareni	PKVY	12	270	22.5	24	6.58
		Namami Gange	1	31	31	31	0
14	Sataon	PKVY	1	26	26	26	0
15	Unchahar	PKVY	7	165	23.57	25	5.79
16	District Total	PKVY	48	1238	25.79	27	6.55
		Namami Gange	1	31	31	31	0
		Total	49	1269	25.89	27	6.52

Source: https://pgsindia-ncof.gov.in/LGList.aspx

A gradual shift of farmers from conventional to the organic farming system is likely to positively impact 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. Since economies of scale in both production and marketing matter in organic farming, some institutional framework may be needed in the forms of SHGs/ farm cooperative/PFOs/contract farming, etc. Organic farming could be an economically viable option in the district if the government builds strong marketing networks linking farmers, processors, and distributors with the easy certification process and minimizes farmers' risk by protecting their farm income through payments of ecosystem services. A long-term system of

incentive and regulation needs to be evolved to retain the existing farmers and motivate others to move towards the sustainable farming system in the district.

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 organic production is another problem. The marketing problem is even more serious in the case of perishable vegetable crops. Contract farming companies and Farmer Producers' companies can be encouraged.
3. Farmers practice organic farming only on a small part of their land (less than one ha) to get the scheme's benefit.
4. The knowledge and awareness level regarding practices under organic farming was inadequate among farmers.

2.1.10 Livestock Sector

i- Trends in Livestock Population

Livestock forms an integrated part of the rural economy. From Table 18, we can infer that the number of indigenous and exotic male cattle has decreased considerably from 429707 in 1997 to 60780 in 2019 and from 10989 in 1997 to 4957 in 2019, respectively. However, on the other hand, the number of indigenous and exotic female cattle has increased considerably from 248853 in 1997 to 264283 in 2019 and from 11226 in 1997 to 61838 in 2019, respectively. Thus, the total number of cattle decreased from 700775 in 1997 to 391858 in 2019, thus, a net decrease of 44.08%. Similar inferences can be drawn from the buffalo data as the number of male buffalo decreased, but the number of female buffalo increased; thus, a net increase of 42.07% in 2019 compared to that in 1997 is observed in the total population of buffalo. A significant reduction in the population of indigenous sheep is observed (83.12%) in 2019 as compared to that in 1997, and during the same period, the population of exotic sheep also decreased significantly, thus, indicating a decrease in the total sheep population by 83.74%. The total population of goats increased from 254175 in 1997 to 277338 in 2019, a net increase of 9.11%. The total pig population decreased considerably from 184301 in 1997 to 22843 in 2019.

The number of female cattle and buffaloes has 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.

Table 18: Trends in Livestock population (in numbers) in Raebareli

	Category	1997	2003	2007	2012	2019
Indigenous Cattle	Total Male	429707	287115	200059	152790	60780
	Total Female	248853	216126	227281	227439	264283

	Total	678560	503241	427340	380229	325063
Exotic Cattle	Total Male	10989	8407	8017	3478	4957
	Total Female	11226	14167	14280	10165	61838
	Total	22215	22574	22297	13643	66795
Total Cattle		700775	525815	449637	393872	391858
Buffalo	Total Male	90936	87055	83303	89282	43945
	Total Female	235430	225097	196471	242137	419747
	Total	326366	312152	279774	331419	463692
Sheep	Total Indigenous Sheep	71208	38206	34489	17478	12013
	Total Exotic Sheep	2986	598	660	1098	47
	Total Sheep	74194	38804	35149	18576	12060
Goat	Total	254175	288458	277183	231258	277338
Pig	Total Indigenous Pig	152089	125883	85761	55758	22449
	Total Exotic Pig	32212	11612	8616	6487	394
	Total Pig	184301	137495	94377	62245	22843
Total Livestock		1551570	1309973	1141648	1044175	-
Total Poultry		168303	152921	128424	160370	-
Source: http://updes.up.nic.in/spiderreports/intialisePage.action And http://dahd.nic.in/animal-husbandry-statistics						

ii- Cattle Care Center

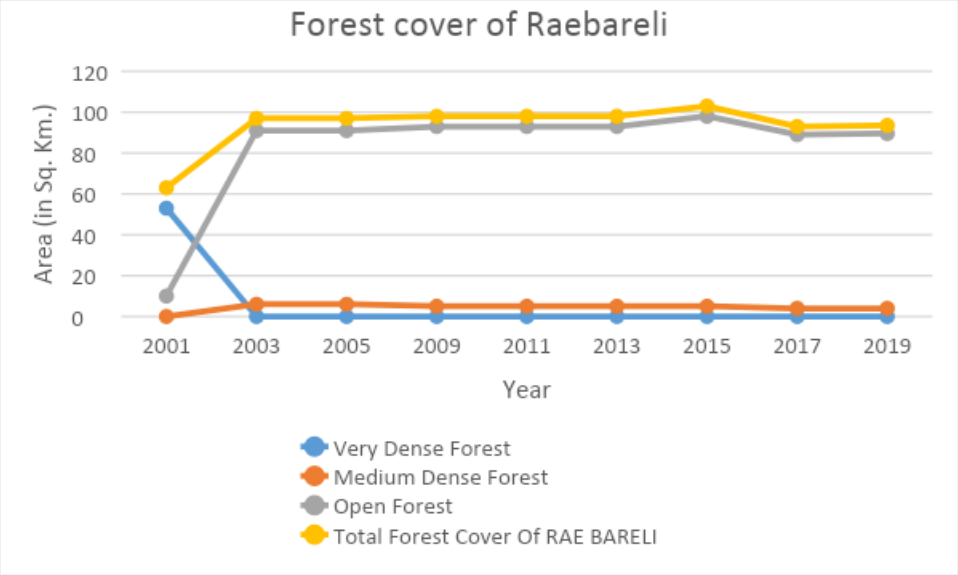
Table 19 shows that the Raebareli district has an active network of cattle hospitals and development centres, which are necessary for the livestock sub-sector to grow. The number of cattle hospitals has increased from 35 in 2010-11 to 46 in 2018-19. The number of cattle development centres increased from 31 in 2010-11 to 38 in 2018-19, and the number of man-made reproduction centre also increased from 55 in 2010-11 to 95 in 2018-19. The number of pig and sheep development centres increased in the later years.

Table 19: Year-wise number of Cattle Hospitals and Development Centers

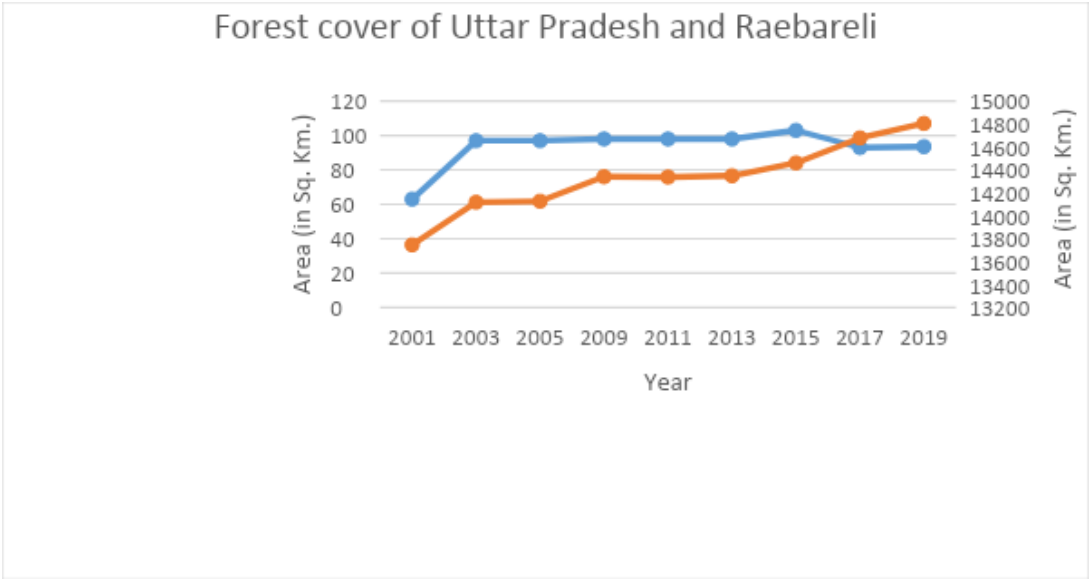
Category	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Cattle Hospital	35	29	35	38	39	38	44	46	46
D- category Cattle Dispensary	12	12	12	14	13	12	13	13	13
Cattle Development Centre	31	31	31	36	39	36	38	38	38
Man-Made Reproduction Centre	55	49	55	69	77	85	94	95	95
Sheep Development Center	2	5	9	9	10	8	13	13	15

Pig Development Center	15	8	15	19	15	15	22	22	22
Source: http://updes.up.nic.in/spiderreports/intialisePage.action									

2.3 Forestry



According to FSI assessment, the forest cover of Raebareli has increased between 2001 and 2015, and after 2015 onwards, it decreased significantly. According to the ISFR 2019, the forest cover of Raebareli is approx.. 93.54 Sq. Km.



The forest cover of Uttar Pradesh has increased from 2001 to 2019, and the forest cover of Raebareli has decreased since the last two FSI assessment.

2.3.1. Biodiversity: The district's biodiversity data includes crop production, livestock population, bird species, and forest cover. The crop production trend shows a reduction in the non-grain crop but increases in all other crops. A total of 53 plant species from 36 families were found in both the captive and wild states, and they are the most commonly used in human health care as per the study performed by Deepti Singh and C.P. Shukla. According to the Forest Department, the forest in the Raebareli district encompasses 4002 hectares. Raebareli, Dalmau, Bachhrawan, and Lalganj are the four ranges. Bachhrawan has the most extensive woodland range. Forest covers 1019.20 hectares in this area. Five hundred forty-four hectares in Tehsil Raebareli, 500 hectares in Tehsil Salon, 348 hectares in Tehsil Dalamau, and 61 hectares in Tehsil Maharajganj have already been planted with trees such as dhak, khair, babool, shisham, neem, vilayati babul, arjuna, kanji, siras, eucalyp Mango and mahuva trees are the most common trees in the district's groves.

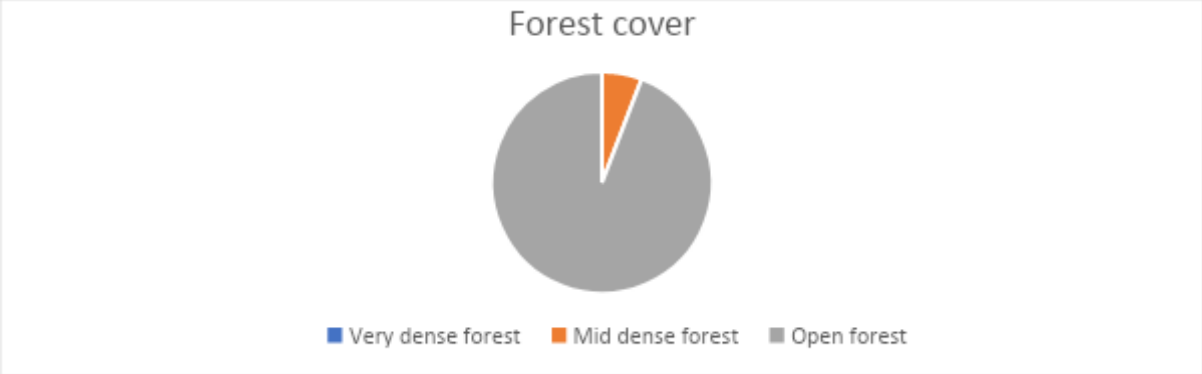
Singh, D., & Shukla, C. P. (2015). Phytodiversity and Traditional knowledge of Rae-Bareli District, Uttar Pradesh. *TECHNOFAME-A Journal of Multidisciplinary Advance Research*, *4*(1), 4-9.

Table 1 Bird species recorded in the district.

Number of species	358
Number of rare/accidental species	3
https://avibase.bsc-eoc.org/checklist.jsp?region=INggupah	

Forest cover (in sq. km.)

Geographical area	Very dense forest	Mid dense forest	Open forest	Total	% of Geographical area `	Change with respect to 2017 assessment	Scrub
4609	0	4	89.54	93.54	2.03	0.54	1.32



2.4 Tourism

The district of Raebareli, which was created by the British in 1858, is named after its headquarters town. Tradition has it that the town was founded by the Bhars and was known as Bharauli or Barauli which in course of time got corrupted into Bareli. The prefix, Rae, is said to be a corruption of Rahi, a village 5km. west of the town. It is also said that the prefix, Rae, represents Rae, the common title of the Kayasths who masters of the town for a considerable period of time were. The Quit India movement was inaugurated on August 8, 1942 and the district did not lag behind any others. Again, there was mass arrests, imposition of collective fines, lathi charges and police firing. At Sareni the police opened fire at an agitated crowed, killing and maiming many. The people of this district enthusiastically respond to the call of individual Satyagragha and large numbers courted arrest. At last, on August 15,1947, the country shook off the foreign yoke and achieved its long-awaited independence. Raebareli celebrated the event with benefiting glee and rejoicing in every home along with the rest of the country. (*Source : Raebareli District Gazetteer*)

Domestic/foreign visitors in different years in particular city

No. of tourists in Rai-Bareli from 2013 to 2020				
	Domestic	**Foreign**	**Total**	**% Growth in no. of tourists**
2013	7372	55	7427	
2014	7373	57	7430	0.04%
2015	7512	81	7593	2.19%
2016	7562	82	7644	0.67%
2017	7582	90	7672	0.37%
2018	14236	93	14329	86.77%
2019	21591	117	21708	51.50%
2020	7945	33	7978	-63.25%

Table-1; Source: Dept. of Tourism, Uttar Pradesh Government

a. The above given Table 1 is prepared in the basis of data recovered from official website of department of tourism Government of Uttar Pradesh. Calculation are being done manually based on the values, taken from tourism report of Uttar Pradesh.

b. The above given Table- 1 shows the number of domestic and foreign tourists in years from 2013 to 2020 in Rae-Bareli.

c. The year 2013 receives 7372 domestic and 55 international tourists in Rae-Bareli.

d. In the year 2014 the number of total tourists shows 0.04% growth while the number of international tourists increased by 2 only.

e. In the year 2015 the number of total tourists shows 2.19% growth, while the number of international tourists increased significantly by 24 nos. Although the growth is significant compared to previous year data.

f. In the year 2016 the number of total tourists shows 0.67% growth, while the number of international tourists increase by just 1.

g. In the year 2017 the number of total tourists shows 0.37% growth, while the number of international tourists increase by 8, which is highest till 2013.

h. The year 2018 has been fruitful for Rae-Bareli tourism and shows 86.77% growth in number of total tourists. The number of international tourists increased by 3 only. That means a domestic tourists came to Rae-Bareli in huge number in 2018.

i. In the year 2019 the number of total tourists shows 51.50% growth, while the number of international tourists increased significantly by 20 nos.

j. 2020 had been an exceptional year. Due to pandemic and lockdown situations Rae- Bareli encounters -63.25% growth (negative growth) in the number of tourists. While the number of foreign tourists remain limited to 33 only.

Domestic and foreign visitors in different years in Uttar Pradesh

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

Table-2; Source: Dept. of Tourism, Uttar Pradesh Government

a. The above given Table 2 is prepared based on data recovered from official website of department of tourism Government of Uttar Pradesh. Calculation are being done manually based on the values, taken from tourism report of Uttar Pradesh.
b. The above-given Table 2 shows the number of visitors who visited Uttar Pradesh from 2016 to 2020. In the year 2016 number of domestic tourists increased to 3.4% compared to 2015, and foreign tourists increased to 1.69%.
c. In the year 2017, the growth rate increased to 9.56% in domestic tourists and 12.65% in foreign tourists.

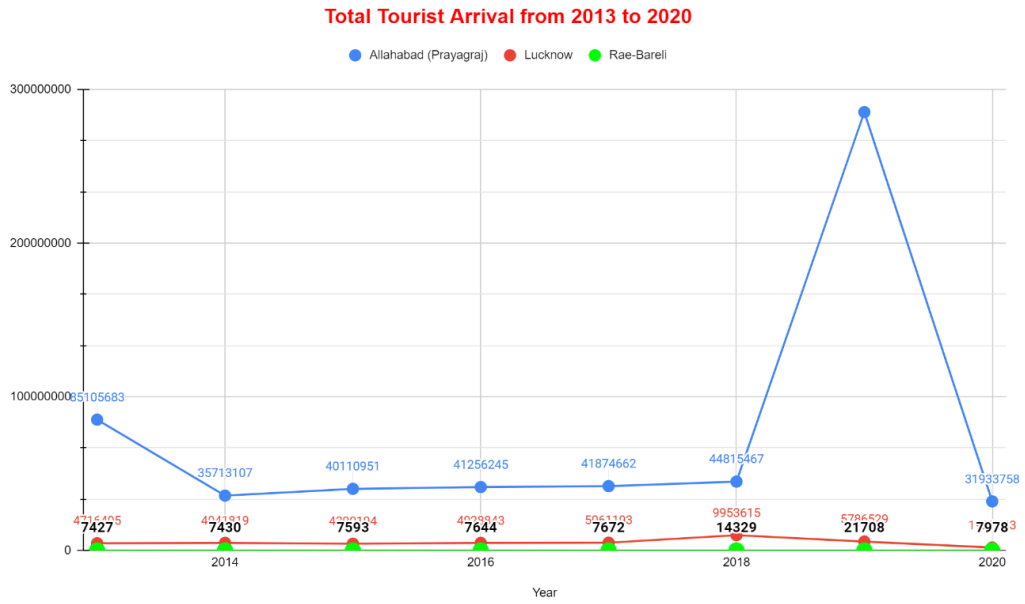
d. Data shows that 2018 had been a fruitful year for Uttar Pradesh tourism. Uttar Pradesh encountered a 21.6% increase in tourist numbers from the previous year, a significant change in numbers. However, the patten is not similar in Rae-Bareli.
e. 2019 was a year when the global event Kumbh Mela 2019 was organized 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 behaviour, 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.
f. 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.
g. 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 Rae-Bareli during Kumbh Mela 2019.
h. The scenario of foreign tourists is worse compared to state data. Even the mega event Kumbh mela could not increase the number of foreign tourists in Rae-Bareli. This signifies the lack of transfer of information.
i. The district witnessed the increased growth in number of domestic tourists but not in foreign tourists. It is necessary to understand the shortfalls before working on upcoming policies and agendas.

Visitors in neighbouring tourist destinations

Total Tourist Arrival from 2013 to 2020			
	Allahabad (Prayagraj)	**Lucknow**	**Rae-Bareli**
Year			
2013	85105683	4716405	7427
2014	35713107	4941819	7430
2015	40110951	4390194	7593
2016	41256245	4928843	7644
2017	41874662	5061193	7672
2018	44815467	9953615	14329
2019	285228710	5786529	21708

2020	31933758	1927363	7978

Table-3; Source: Dept. of Tourism, Uttar Pradesh Government



Graph-1; Source: Dept. of Tourism, Uttar Pradesh Government

a. The above given data in the Table-3, is taken from the official website of tourism government of Uttar Pradesh. The above-given data shows the number of tourists (total tourists which comprises of domestic and foreign tourists) in different years from 2013 to 2020, in four different tourist sites; those located in the vicinity of Rae-Bareli.

b. The graph 1, given above shows tourist visit in your eight consecutive years; different colour lines show different city. Blue for Prayagraj, Red for Lucknow, Green for Rae-Bareli. All these sites share Ganga ghats (Except Lucknow which possess subsidiary river of Ganga which is Gomti River) and are located near to each other.

c. From the trendlines in the Graph-1, it can be visualised that these three districts do not follow similar patter or trend line.

d. From the Graph-1 it can be visualised that in 2014 the number of tourists in Prayagraj declined, whereas the decline is not significant in the Lucknow and Rae-Bareli data.

e. From the Graph-1 it can be visualised that in 2019 the number of tourists in Prayagraj skyrocketed while the other two cities did not experience the same effect. Although Lucknow experienced a reverse result in this year, when the number of tourists in Lucknow declined by -41.87% and Rae-Bareli experienced 51.50% increase in number of tourists this year.

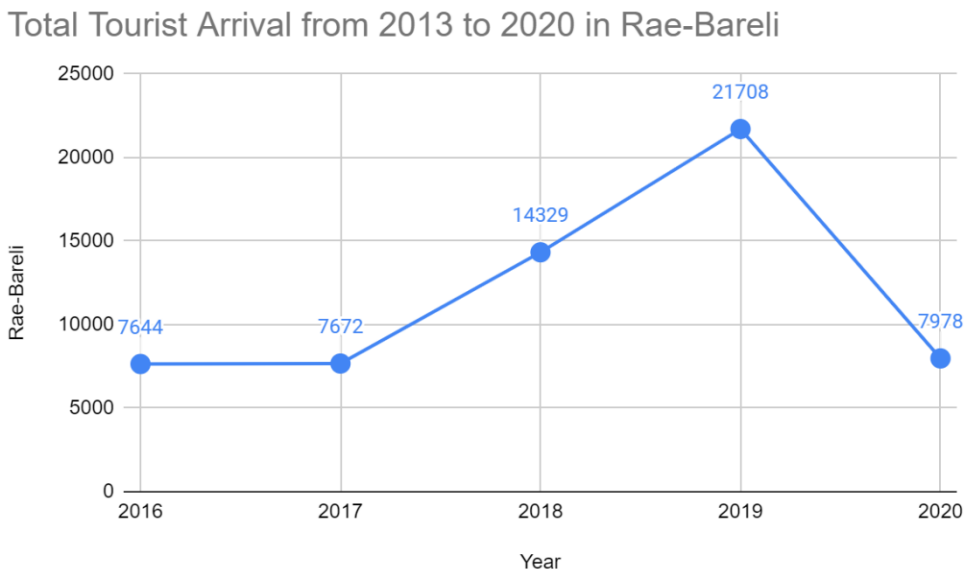
f. The year 2020 had been bitter for hospitality and tourism sector. In this year Prayagraj, Lucknow and Rae-Bareli experienced -88.80%, -66.69%, -63.25% growth (negative growth) in the number of tourists respectively.

Budget allotted/ Expenditure in different years by tourism dept.

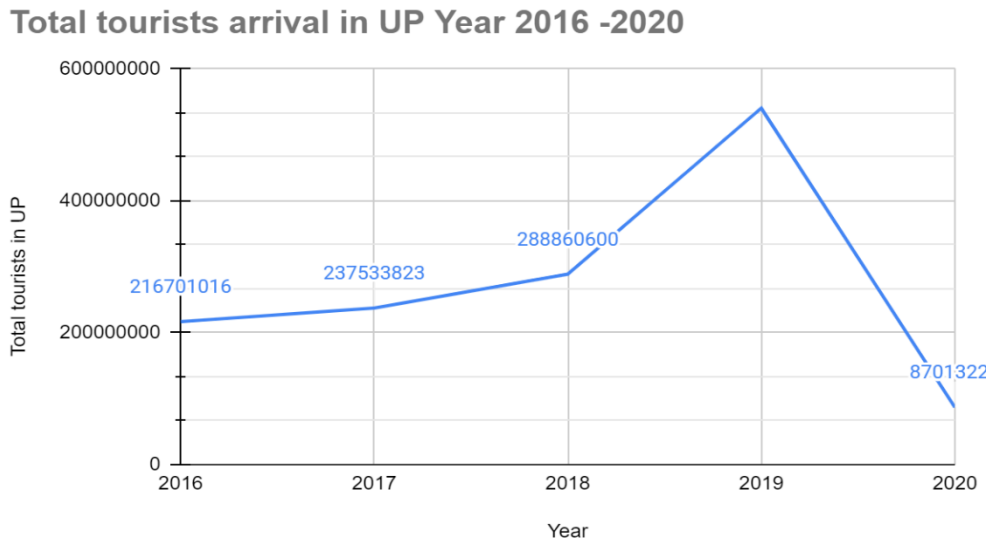
Budget -Department of Tourism, in Different Years		
Year	**Budget in Rupees**	**Percent increase or decrease**
2015-16	2,245,098,000.00	
2016-17	1,992,912,000.00	-11.23%
2017-18	2,671,016,000.00	34.03%
2018-19	6,870,209,000.00	157.21%
2019-20	8,596,205,000.00	25.12%
2020-21	10,382,037,000.00	20.77%
2021-22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

Table-4; Source: Dept. of Tourism, Uttar Pradesh Government

The above-given table 4 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 25.12% 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.



Graph-2; Source: Dept. of Tourism, Uttar Pradesh Government



Graph-3; Source: Dept. of Tourism, Uttar Pradesh Government

a. The above given Graph 2 and 3 is prepared on the basis of data recovered from official website of department of tourism Government of Uttar Pradesh. Calculation are being done manually based on the values, taken from tourism report of Uttar Pradesh.
b. The above given graph 2 and 3 on comparison shows that both the graph follows similar trend line in growth in number of tourists from year 2016 to 2020.

c. The above given Graph 2 and Graph 3, shows that the trends in number of total tourists arriving in Uttar Pradesh (Graph-3) and total tourists arriving in Rae-Bareli (Graph-2) follows similar pattern.
d. In the year 2017 both U.P. data and Rae-Bareli shows stagnant growth.
e. In the year 2018 both the graphs show similar pattern of accelerated growth in the number of tourists.
f. In the year 2019 both the graphs again show similar pattern of hyper-accelerated growth in the number of tourists. Credit of this hyper-acceleration goes to Kumbh Mela 2019.

2.5 Wetlands

The district is known for the vast number of wetlands, some of them renowned ones. The district consists of lakes like Tal Khaur (281.66 Ha), Mug (219.36 Ha), Pindauli (204.33 Ha), Dobaha (201.26 Ha), Barna Tal (223.61 Ha). Table 1 represents the number of wetlands and their area representation in the district. There are around 1004 wetlands sized greater than 2.25 Ha and 2035 less than 2.25 Ha areas. The region consists of small and medium-size wetlands only, generally less than 200 Ha in the area, and there are around 15 wetlands with more than 200 Ha.

Table 1: Wetland Data of Rae Bareli District

	Total Number of												
	Wetlands:			**Area (ha)**									**Aquatic Vegetation**
Natural Wetlands	**NRCD**	**NWIA**	**Diff.**	**<2.25**	**<5**	**<10**	**<20**	**<50**	**<200**	**<500**	**<1000**	**>1000**	
Lake/ponds	79	90	11	0	3	6	12	33	20	5	0	0	62
Ox-bow lakes/cut off meanders	112	136	24	0	8	11	24	29	37	3	0	0	97
High altitude Wetlands	0	0	0	0	0	0	0	0	0	0	0	0	0
Riverine Wetlands	7	7	0	0	1	0	3	0	2	1	0	0	3
Waterlogged	15	17	2	0	1	6	4	2	2	0	0	0	11
River/Stream	0	35	35	0	0	0	0	0	0	0	0	0	0
Man-made Wetlands	**NRCD**	**NWIA**	**Diff.**	**<2.25**	**<5**	**<10**	**<20**	**<50**	**<200**	**<500**	**<1000**	**>1000**	**AV**
Reservoirs/Barrages	1	1	0	0	0	0	0	0	1	0	0	0	1
Tanks/ponds	131	133	2	0	54	32	30	13	1	1	0	0	89
Waterlogged	488	585	97	0	113	112	105	95	58	5	0	0	225
Salt pans	0	0	0	0	0	0	0	0	0	0	0	0	0
Total (3039)	833	1004	171	2035	180	167	178	172	121	15	0	0	488

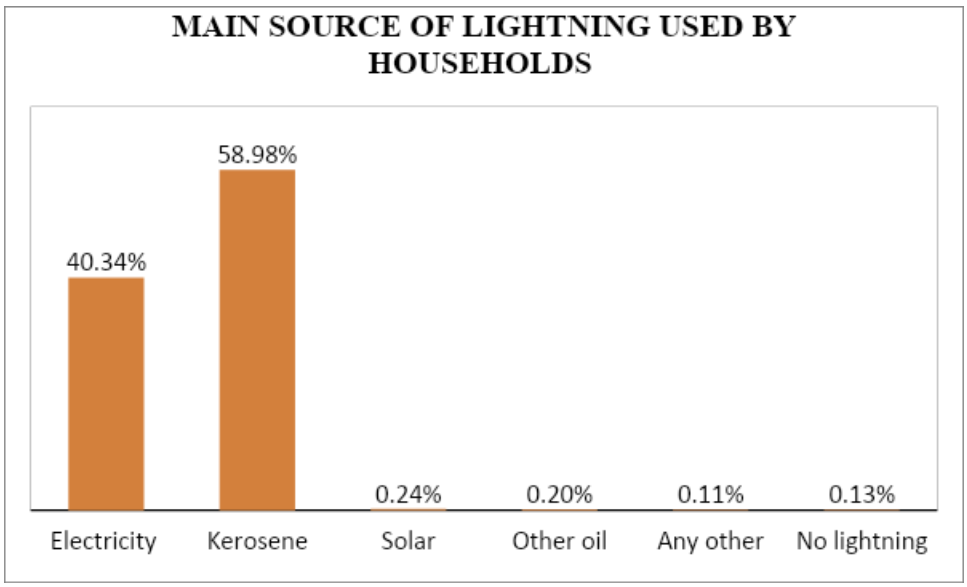
Source: (National River Conservation Directorate, 2008), (Space Application Centre-ISRO, 2007)

- The district comprises 3039 wetlands; most are waterlogged and lake/ponds/tanks.
- The wetland size is small and medium-sized in general.
- The number of natural wetlands is more than man-made.
- Half of the wetlands (>2.25 ha) have aquatic vegetation.

2.6 Energy

2.6.1. Solar Energy

The Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA) is the nodal agency which looks after the growth and expansion of renewable energy in the state. UPNEDA takes efforts to develop the capacity in renewable energy sources such as solar energy, small-scale hydro-electricity and biomass-based electricity production in the state. Various capacity solar power plants are being installed for electricity generation from solar energy. According to the 2011 census (as depicted in figure), 58.98% households use kerosene, followed by 40.34% using electricity and only 0.24% use solar for the purpose of lightning.



The annual reports on UPNEDA website mention the various solar plant units installed at the government buildings and other places in the district. Solar Rooftop Systems have been installed at various government offices such as at Vikas Bhawan-7 kW, Collectorate Bhawan- 34 kW and BSNL Raebareli- 25 kW. 6 Solar High Mast Lightning System have been installed in the year 2018-2019 in the district Raebareli.

2.6.2.Biomass Energy

Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA) is the nodal agency which makes efforts to develop the capacity in renewable energy sources such as solar energy, small-scale hydro electricity and biomass-based electricity production in the state. Biomass-based co-generation in the state sugar mills and rice husk based-electricity generation projects are being encouraged. Agriculture is the main economic activity of the district. Rice, wheat, gram, pulses, potato are the main crops grown in the district. The district has a good cropping intensity of 155.09%. The productivity of some of the major crops is recorded as 21.70 Qtl/ha of wheat, 20.41 Qtl/ha of rice, 10.39 Qtl/ha of gram and 241.51 Qtl/ha of potato. The district also has approximately 13952 ha cultivable waste land. 38721 ha accounts to the current fallow.

The UPNEDA website mentions installation of certain biomass energy plants in the district. Chandan Cold Storage, Janta Cold storage and M/S UP Transformer are some of the places where biomass gasifiers have been installed in the district. A co-generation power plant was installed long back in 2006-2007 in Bhavani Paper Mill.

Fig. 1 is a graph depicting the type of fuel used by households for cooking, taken from 2011 census. It can be clearly seen that approximately 78% households use firewood for cooking. This means that the firewood is burnt directly.

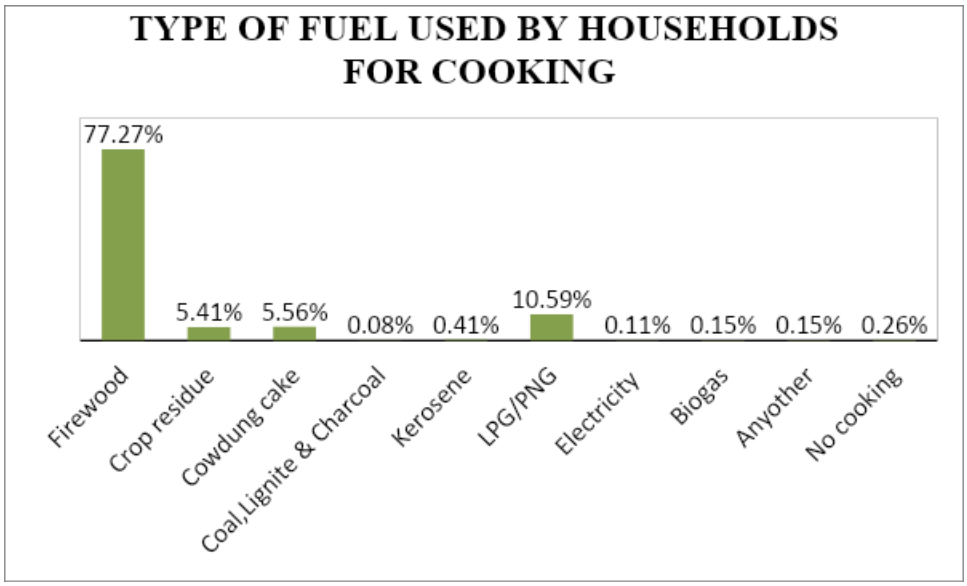


Fig. 1

The district has high productivity of rice and wheat, so the attention needs to be given to minimize the burning of crop residue on the fields, instead providing it to the biomass energy plants. UP government's Biomass Based gasifier Power Project is the most appropriate project for the district.

2.6.3.Biogas Energy

As existing biogas plant data is unavailable for the district, biogas potential has been evaluated by average livestock and agricultural waste production. Biogas potential from animal and agricultural waste calculated approximately as two crore m^3/year and twenty six crore m^3/year respectively. This amount of biogas generation can efficiently complete the energy demand of the district.

2.6.4.Hydropower Energy

The district has undulating topography, with crowns as high as 120.4 metres above sea level in the north and lowlands as low as 86.9 metres in the south. The Ganges and the Sai are the two major rivers that run through Raebareli (a territory of Gomti). At Dalmau Tehsil, the Ganges forms the

district's southern border, while the Sai River runs across the territory's western border. The Ganga Khadar, Southern Clay Tract, Ganga Upland, Northern Clay Tract, and Central Tract are the five primary topographical sections that the Raebareli district is separated into by diverse river drainage (River Sai Upland).Available data shows no hydropower plant exists in the district, and no site has been investigated for future projects.

6 QUALITATIVE DATA ANALYSIS

6.1 AGRICULTURE, ALLIED ACTIVITIES,

6.2 FORESTRY

The district was initially crowded by dense forests which surrounded the strongholds of the Talukedars but with the increase of population, the forests were gradually reclaimed for agricultural purposes. Of the total area of the district, more than 4,918 hect. of land was under forests during the year 1997-98. Under social forestry schemes, fruit and non fruit bearing trees have been planted along road sides. The important trees are Dhak, Khair, Babul, Mahua, Sheesham, Neem, Kanji, Siras, Eucalyptus, Mango and Jamun. Groves in the district are mostly of mango and mahua. Wild animals have greatly decreased in number and variety. This has been mainly because of deforestation. Neelgai near Ganga, Jackals, fox, cat, mongoose and other animals are found in the district.[3]

3.2.1. Biodiversity : In Uttar Pradesh's Raebareli district, the Samaspur Bird Sanctuary is a perennial lowland marsh typical of the Indo-Gangetic Plains. Its six interconnected lakes are extremely important during monsoon rains. Annual bird counts consistently reveal well over 75,000 birds, with over 250 permanent and migratory species identified. The Sanctuary is home to endangered species including the Egyptian vulture (Neophron percnopterus) and Pallas's fish eagle (Haliaeetus leucoryphus), as well as more than 1% of the fragile common pochard population in South Asia (Aythya ferina). The wetland is home to at least 46 freshwater fish species, with some moving in from adjacent rivers during monsoon floods. Food and agricultural fodder are produced on the site, and wildlife is preserved. Invasive species, however, pose a danger to its ecological identity, with foreign floral species accounting for more than 40% of all identified species. The Sanctuary is managed jointly by the Office of the Conservator of Forests (Wildlife) and State forest authorities.

[3] https://www.censusindia.gov.in/2011census/dchb/DCHB_A/09/0927_PART_A_DCHB_RAE%20BARELI.pdf

6.3 ENERGY

As per the data of the year 2013, Rae Bareilly district energy consumption is around 725 TJ/year and 3.8 GJ/capita/year. GHG emission of 49,334 Ton CO_2 equivalent and 0.258 Ton CO_2 equivalent/capita has been evaluated for the district.

5.5.1. Solar

Presently the pace of progress of solar energy in Raebareli cannot be considered very good. An article in MERCOM with the heading 'ITI Limited Invites Bids for a 1.5 MW Solar Power Project in Raebareli' reads ITI Limited, a public sector undertaking under the Department of Telecommunication, has invited bids to develop a 1.5 MW grid-connected solar power project at its manufacturing facility in Raebareli district of Uttar Pradesh. The scope of work includes the survey, design, fabrication, supply, testing, and commissioning of a 1.5 MW rooftop (with net metering) or ground-mounted solar power project at its premises in Raebareli. Along with this, the successful bidder will also have to take care of the operation and maintenance activities for five years.

5.5.2. Biomass

The district RaeBareli has a high potential of biomass energy production. Wheat and Rice are the main agricultural crops. The straw obtained from the paddy cultivation, left after harvesting is banned to burn in the state. Locally known as 'Parali', the wheat straw, if burnt in the field, destroys its fertility. An article in Amar Ujala, mentions how even after being banned, the paddy straw is being burnt in the district. The district has many rice mills which can use biomass for energy production, but in recent times no such development can be seen. Hence the requirement is to make people aware about biomass energy and to provide an encouraging environment for establishing small start-ups which produce energy. Also to stop stubble burning it is necessary that people are given an alternative option of using agricultural residue. The fallow land available in the district can be used to set up the biomass plants.

5.5.3. Biogas

Uttar Pradesh Jal Nigam has been given the responsibility of scaling-up FSTPs in the state through AMRUT funding. Currently, an FSTP in Unnao is under the trial-run stage, and contracts have been awarded for FSTPs in Loni, Raebareli, and Lakhimpur. Tenders for FSTPs have been planned for another 52 cities, out of which tenders for six cities are already out.

5.5.4. Hydropower

For hydropower generation, the National level program, such as the small hydropower project program, runs in the state. The implementation of small hydropower in the state is carried out by Uttar Pradesh New and Renewable Energy Development Agency and Uttar Pradesh Jal Vidyut Nigam. Neither sites have been investigated so far nor exist at present in the district.

6.4 TOURISM

By air

Fursatganj is the nearest airport to reach the Samaspur Bird Sanctuary in the Rae-Bareli; which is located 23 kilometres from the site.

Another nearest Airport is Chaudhury Charan Singh International Airport in Lucknow, which is around 85 kilometres from the Rae-Bareli.

By rail

Unchahar is the nearest railways station which is located 14 kilometres from the sanctuary. Rae-Bareli is the city railway station of the district.

By road-

NH-30 is the connecting highway to the Rae-Bareli. Lucknow is connected through this highway and public transportation is easily available.

Best Time to Visit

November to March/April

Places of interest

Dalmau
Statue of King Dal Dalmau is located on the banks of River Ganga and is famous since British time. It has been the Historical town of the district Uttar Pradesh. Historical palces at Dalmau are King Dal's fort, Bara Math, Mahesh Giri Math, Nirala memorial Institute, a well made by Ebrahim Sharki, Palace of Nawab Shuza-ud-daula, Baithak of Alhaa Udal, Dalmau Pump canal etc.

Indira Gandhi Memorial Botanical Garden
Statue of former PM of India Smt. Indira Gandhi at Indira Gandhi Memorial Botanical Garden was established in the year 1986 to restore the ecological balance and bring awareness about environment in the population. The garden is situated near the Lucknow-Varanasi highway. This botanical garden is situated on the northern bank of Sai River. Total area of the park is 57 hectares where numerous varieties of plants can be found with their nomenclature on it. The purpose of garden is not merely to make it a place for cultivating flowers, fruits or vegetables but also an educational installation for scientists, research workers/ students and general public for creating interest in flora. Medicinal plant/ herbs trails (consist of 114 plants of 23 medicinal species such as 'Neem'(Azadirachta indica), Jatropha curcas (Bio-diesel plant) 'Jamalghota', Datura metel 'Dhatura', Nerium Oleander 'Kaner' etc.), Cultural plant trails (consist of 156 plants of 16 species such as Aegal Marmel (Bel), Ficus Religiosa (Pipal)), Economic Plant trails (consist of 60 plants of 12 species), Bulbous garden (consisting of Caina, Jaiferenthus, Rajnigandha, Haimanthos, Nargis, Gladuolos & Haemoroucoulis etc.) Rock garden, Rose Garden, Seasonal plant garden, Aquatic Garden and a Greenhouse are included in the Botanical Garden. (source: raebareli.nic.in)

Behta Bridge

Aqueduct at Behta This Bridge is situated at the boudary of the Raebareli city. The important thing of this Bridge is that at this place Sharda canal crosses the Sai River. An aqueduct has been constructed and the canal flows in the duct.

Lucknow

Lucknow- City of Nawabs is situated 85 kilometres from Rae-Bareli and is well connected through national highway. Lucknow is full of tourist places and embraces Mughal and British raj era in its heritage buildings. Lucknow is also famous for its Mughlai cuisine such as Biryani, Galaoti Kebab and and much more. Local handicraft called chickankari is very famous in the entire world. Lucknow has numerous tourist spots ranging from Imambarah, Rumi Darwaza, Bhool Bhulaiya, to modern architure of Ambedkar Park, River Front among many more.

Allahabad

Allahabad is located 120kilometers from Rae-Bareli and is well connected through national highway.

Allahabad- Now known as Prayagraj is famous tourist site. The city embraces rich history and religious aspect in it. Many Freedom fight struggles originated from this place and has been a political hub during British raj. Tourist places such as Khushro Bagh, Anand Bhawan, Swaraj Bhawan, Minto Park, Bharadwaj Park, Sangam, Akbar Fort etc. can be seen and praised for its uniqueness.

Data analysis

7 From the Table-1 it is visible that from 2013 to 2017 the growth in the number of tourists in Rae-Bareli is insignificant.

8 From the Table-1 it is visible that from 2013-2018 the growth in the number of international tourists is nominal. The average number of tourists visiting from 2013 to 2018 comes out to be 73 which is very less.

9 Rae-Bareli tourism experienced a huge growth in number of tourists in 2018 and the number reached 14329 total tourists. Number of international tourists also increased to 193 in this year.

10 2019 is another good year for Rae-Bareli tourism, where the district receives 51% growth in the number of tourists. The credit for this huge growth goes to Kumbh mela-2019 celebration in Prayagraj.

11 From the table-3 it can be visualised that Rae-Bareli fails to attract tourists from Allahabad now Prayagraj and Lucknow. Because the trendlines of Rae-Bareli does not resembles either district. Which means that arrival of tourists is not same in these neighbouring districts, and each fails to attract tourists from other. This denotes that there is a strong need of communication through promotion and advertisements. It also means that input to any of them will not affect the tourism activities in the other two districts. Which is not a good signal for promotion and expenditure on infrastructure.

12 Graph-2 and Graph-3 shows that tourist arrival in Rae-Bareli and Uttar Pradesh follows similar trendline. From this trend we can assume that activities going on in the state can affect the tourism in Rae-Bareli. Such as political instability in UP can affect the tourism activity in Rae-Bareli negatively or vice-versa.

12.1 WETLAND

The wetlands are the source of many ecosystems and habitats for various species. The wetlands create a unique ecosystem that supports many species simultaneously like aquatic, terrestrial, and human beings. Local stakeholders directly or indirectly depend on the wetland for their income and small-scale business. These businesses can be a great opportunity can be turned into a large-scale production hub using the right approach. The region is known for the *karmabhumi* of many renowned leaders. The district also has a variety of birds found in the region Samaspur bird sanctuary. The data collected and analyzed shows the region's production and possible product that can be derived from the raw product. The list of sources and the possible products are mentioned below:

- Pulses and wheat production is recommended as commercial crops in the region, leading to products like flour and pluses.
- Products like oil, finished pulses can be derived from the crops and millets grown in the region.
- Also, this region is a belt of large varieties of oil production in the region like mustard, linseed, castor seeds which can turn into a valuable market for oil production in the region.
- The district is famous for its man-made ponds and historical values.
- The region has a large production of dairy products, leading to increased animal husbandry. Wetlands can support the growth of fodder for the animals in the region.

13 ACTION PLAN DEVELOPMENT

13.1 AGRICULTURE

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13.2 FORESTRY

In July 2019, the government of Uttar Pradesh took the initiative to plant 22 crore saplings. The Forest Department involved the farmers as stakeholders to plant seedlings in their fields. Farmers are expected to sow quality planting material such as clonal plants, which are not available in the UP forest department nurseries. There is also the need to have a minimum support price (MSP) for the timber produced by farmers with a buy-back arrangement. This in turn will motivate them to plant more trees, which would benefit the economy as well as the environment.[4]

Projections & Monitoring Matrix

Outcome indicators can be forest produce, buyback of products by the state, annual gross income generated by these outputs, contribution of the forest output in the district domestic product.

4.2.1. Biodiversity : As only two percent of the geographical area has forest, hence more plantations should be done. Government and local bodies should spread biodiversity awareness from places like Dalmau, Indira Garden, etc.

13.3 TOURISM

14 Ecotourism development

Samaspur Bird Sanctuary

Bird Sanctuaries, wildlife sanctuaries and forest reserves were built exclusively for the preservation of bird species (native) also migratory birds in the Salon of Rae Bareli District of Uttar Pradesh. Established in the year 1987-Samaspur bird sanctuary is located in the Gangetic plains covering an area of 780 hectares also known as paradise for bird lover. Many of the migratory birds choose this place similar to Nawabganj Bird Sanctuary in Unnao, for breeding and reproduction.

Located around 120 kilometres from the capital city Lucknow, Samaspur Bird Sanctuary is a shelter of around 250 bird species. Birds can also be seen in summer season; however, the number increases many folds in winter season. Species like Vultures, Kingfishers, Spot Bill Teel common and Teel Whistling, *Comb Duck, Spot Bill, Spoon Bill* etc. are commonly habituated at this place and can be seen throughout the year. Surkhab a native bird its permanent habitat at this Bird Sanctuary. Native and some exotic fish species are also found in the lake situated in the Sanctuary. Migratory birds from Siberian countries come at this place to enjoy pleasant weather in winters.

[4] https://www.teriin.org/article/special-drive-tree-plantations-uttar-pradesh-faces-several-challenges

The Sanctuary has six lakes inside its campus area viz. Samaspur Hakganj, Rohania, Mamuni, Bisaiya, Girwa Hasanpur. More than 50 thousand waterfowls can be seen in the months from November to March in these lakes. The lakes serve as a breeding space for many bird species.

Sarpat, Mango tree, Mahuwa, Shesham, Neem can be found at the premises although the campus is considered barren for the flora.

- **Sustainable Tourism**

It is a type of tourism in which all the needs and desires of a tourist/ and other stakeholders of the 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 locals/natives can be provided by including them in trade and business activities.

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

One example of sustainable tourism is promoting tourists 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 a cycle to roam around nearby places with help in reducing carbon footprint and it economical. It is aimed at the minimum negative impact on the environment created by tourism activities.

Ghats can be given shape to support the economy of local natives and the environment simultaneously. Sustainable development is important to preserve eco-tourism site and Ganga River.
Avoid dumping waste from the NTPC plant directly to the river.

- **UP Tourism Policy, 2018**

The vision of this policy is to establish Uttar Pradesh as a preferred tourism destination in India by 2023, achieve the country's highest tourist arrival and tourism receipts, and ensure the best visitor experience.

Targets

- To attract investments with a target of INR 5,000 Crore per year
- To provide employment to approximately 5,00,000 people per year
- To impart training to 10,000 tourism service providers over the next five years.

- To convert 10 heritage buildings (Buildings with heritage value) to heritage hotels per year.
- To attract 1,00,000 tourists to national parks and wildlife sanctuaries in Uttar Pradesh per year.

Incredible India- Bed & Breakfast Scheme

- The essential feature of this scheme is the invention of the 'Home Stay' facility.
- This scheme aims to provide accessible, relaxed and low-cost accommodation to tourists in tourist places and cities.
- The scheme was launched in 2008.
- This scheme applies to all Cities in Uttar Pradesh.
- The scheme is categorized into "Silver" and "Gold" based on Quality of service provided, status accommodation, facilities provided.
- The registration fees for the silver category are Rs.1000/- and Rs.2000/- for gold category accommodation.

Projections and Monitoring matrix

Sector	Intervention	Strategy	Total cost	Expected Outcomes
Tourism	**Research**	• Based on various data and matrices, it is possible to predict the reason and motivation for tourism. Through extensive qualitative and quantitative research, it is also possible to determine the variables affecting tourism in Uttar Pradesh.		A well-researched document as a reference for other processes. Factors that affect tourism in Uttar Pradesh. Define the determinant of tourism activity.

		• Research must be free from all the political pressures and influences. • The researchers must ensure that the field data and secondary data are correct and not modified while entering the new records. • Need to involve unbiased researchers.		
	Planning	• Action plans can be developed for intervention based on the research and analysis of different data and reports. • Developing an Action plan is vital because results depend on how it is planned. • Planning must consider the social status of the State and the image in the tourists' minds. • No place should be given to non-		Planning to be based on research and previous lessons. Realistic planning for successful implementation. .

		practical projections. ● Planning about when to organized Mahotsav/ festivals/ fairs to pump the local economy. ● Separate planning for different demographics of tourists for comfort and leisure tours. For example, while planning the tour packages and tariffs, it is crucial to consider the demography of tourists. Foreign tourists ask much for hygiene while local tourists ask much for discounts. Hence these concerns must be included. ● Need to develop the sites as per a set of standards		

		to attract a wide range of tourists. ● Brand Manufacturing to increase tourism activity. ● Organizations of grand events. ● Use of allocated budget.		
	Implementations	● Various schemes can be developed, such as tourist packages, tariff plans etc., to attract more and more tourists. ● Mahotsav and Fairs to be organized to rejuvenate the local economy and attract tourists. ● Developing tourist circuits ● Developing eateries ● Connecting tourism with local culture and food.		To attract more number of tourists and maximize the revenue from tourism. To improve the image of the State and not let the other social factor affect the revenue of tourism.

		• Extensive marketing for advertisement. • Famous face as brand ambassador. • Extensive branding and marketing. • Development of tourism spots and heritage sites. • Availability of information on government websites along with tour packages. • An extensive market research for the development of strategies • Ganga arti tradition • Ganga Festivals to boost eco-tourism activities • Tree plantation drives near River. • Tourist policies that include small cities such as Rae- Bareli in big city tour		

		packages. For examples in tour packages of Prayagraj or Lucknow, Rae-Bareli can be included to promote tourism at this place.		
	Impact Assessment of results	• Calculating what the touchpoints are. • The reason for failure • The reason for the success • Lesson for next planning		To learn the lesson and find out the root cause of success and failure, to be used further with modification

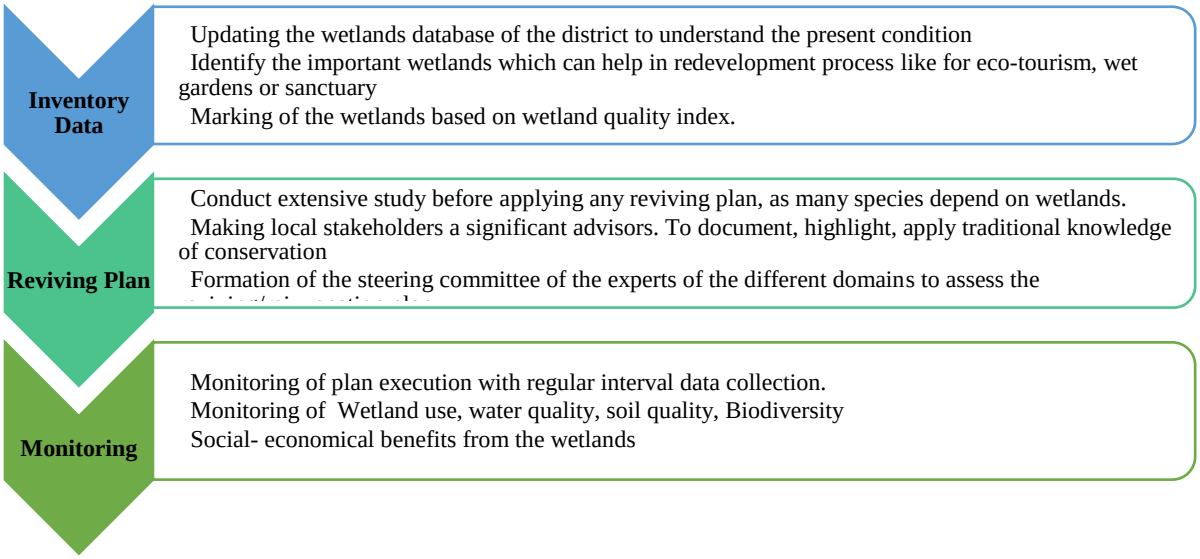
SWOT analysis of Tourism

S No.	**Strength**	**Weakness**	**Opportunity**	**Threat**
	• Eco-tourism site-Samaspur Bird Sanctuary.	• Could not attract tourists from neighbouring Districts such as Prayagraj (Allahabad)	• Ganga Ghats can be developed to promote tourism activity.	• NTPC (National Power Thermal Corporation) is located in

	• Geographical Location- located between two major tourist locations of the state. • Rail/Road connectivity. • Rich History.	and Lucknow. • Underdeveloped Ghats. • Less promotion • Non availability of good hotels. • Lack of advertisement and promotion of district specific tourism sites.	• Steamers can be provided at Rae-Bareli Ghat for sightseeing to nearby big cities such as Allahabad. • Hotels managed by UP tourism can be upgraded and promoted and connected through app such as OYO hotels to attract more tourists and easy accessibility.	Unchahar,Rae-Bareli is a coal based power station which cause lot of air pollution and makes environment not fit for tourism. • NTPC pollution can be dangerous for Ganga. • NTPC pollution can be dangerous for Samaspur Bird Sanctuary. • Rapid unsustainable development projects and harm natural beauty of the place.

14.1 WETLANDS

The district is comprised of some of the healthy and wealthy wetland ecosystems. They directly or indirectly support millions of people and provide goods and services to them. They support all life forms through extensive food webs. They are habitat to aquatic flora and fauna and numerous species of birds, including migratory species. They mitigate floods and recharge the groundwater. They need to be taken care of, and action on different fronts must be taken. The action plan below gives a glimpse of the action and development required to protect, conserve, rejuvenate the wetlands existing and extinct.



14.2 ENERGY

14.2.1 Solar

The district requires solar energy and the policies made by the government.This should be done by the village panchayats, self-help groups and the other local government and government representatives. Attention needs to be paid to the economic sectors in the district, such that they are powered by solar energy and when the solar energy sector will expand it will also increase the employment opportunities in the district. The Kusum Yojana among the farmers should be promoted by making them aware about the different components. When provided with the solar pumps people could irrigate their lands with any interruptions made due to the utility supply. This would also add to their income. Other than this where required solar feeder segregation technology should be introduced. The industries, especially the small scale ones, should be provided with the subsidy and the net metering facility. This will give them returns quickly and they will not have to wait for longer durations to earn profit. If not possible then the industrial sector should be provided with the financial assistance for the off grid connections.

Other than this the government should install solar plants in government schools, colleges, hospitals and other public buildings. The remote areas where there is lack of proper infrastructure the concerned authorities should encourage people to install off-grid plants and the users should be provided the solar power units at the minimal possible rates**.**

Projection and monitoring

The district first requires people to get aware about solar energy and its benefits followed by making people educated about the policies the central and the state governments have made. Village panchayats and other local governments along with other self-help groups could play a major role in spreading awareness about solar energy. Next step could be providing some financial help for the off grid solar panels in the remote areas or in the areas where utility supply has not yet reached. Also, the small industries and the MSME's could be allowed for net metering so that they get early returns. Or they should be provided with financial assistance for the off grid connections. The other thing which can be done is establishing solar feeders segregation technology under Kusum Yojana in those villages where the majority of farmers could not easily afford individual solar pumps. An easy and customer friendly channel should be created for those willing for on grid connections under the National Solar Mission.Powering agriculture with solar would help the district's economy to boost in a sustainable manner.

14.2.2 Biomass

The main economic activity in the district is agriculture, which produces large amounts of residue. The residue produced is highly potential for the production of bio-energy. It is restricted to burn rice straw i.e., 'parali' in the district, but no alternate use of it has been told to the people. The problem is that the crop residue is being burnt because there is no other alternate method with the farmers to utilize the residue.

There needs to be a development of a system which utilizes the agricultural residue at community level. Also people should make available alternate methods of using the agricultural residue. Government should encourage community based biomass plants in the villages especially, and these should be provided with the wastes available from other urban and industrial sources as well.

Projection and monitoring

To begin with the development of the Biomass energy sector in the district, it is important that biomass based gasifier projects are either set by the local panchayats in the villages or some private firm. For this a friendly environment has to be created to ease the establishment of bio-energy plants. Followed by this would be building a well-connected transportation system. Also there should be a norm that each rice mill should have a biomass energy plant and this mill should be made capable of utilizing the agricultural residue left on the fields after the harvest. Nextly, community based biomass plants which are capable of consuming all other type of wastes should be set up.

14.2.3 Biogas

The sugarcane-based sugar industry has the potential to be a great source of long-term bio-energy. Despite several hurdles, the Indian sugar industry has already moved forward with power export via bagasse-based co-generation. M/s Nandganj Sirohi Sugar Mill Ltd., Dariyapur, Raebareli exist in the district and can produce biofuel and biogas. Therefore a biogas plant should be developed in that area.

Kheer's Akoharia and Gonamau each have a capacity of 70 cows. However, there are 169 and 155 cows in each. Instead of 300 cows, 489 cows were tied in Merui's cowshed. In Rahi's Belakhara, there is a large Gaushala. In addition, instead of 300 cows, 555 were found wandering. Instead of 75 cows, over 125 cows were spotted roaming in Lalganj's Govindpur Valauli Gaushala, and they were walking in the mud. More cow shelters are required, or the capacity should be increased by increasing cow shelters area. These shelter can be connected to biogas plant to generate methane.

14.2.4 Hydropower

Many villages such as Babura, Jamalnagar, Mohaddinpur, Jahangirabad, entire Revati Singh, Chak Malik Bhiti in the district are affected by the increased water level. A drainage system should be made that empties into canal or river. These canals should be used for power generation.

15 RECOMMENDATIONS

5.1. Agriculture and allied sectors

- Food grains, dominated by Wheat and Rice, constituted about 89% of the GCA. Good quality seeds should be introduced for wheat and paddy to increase productivity in the wheat-paddy cropping system. Moreover, the existing cropping pattern needs to be diversified towards high-value horticulture and livestock activities. The government can promote micro and small units for horticulture products processing.

- Farmers should use salt-tolerant varieties to boost the yield of major crops in rice-paddy cropping systems in salt-affected areas.

- There is a need to bring more area under the micro-irrigation like drip and sprinkler systems to increase the water use efficiency and crop yields, especially for vegetable and fruits cultivation.

- About 96% of farmers in the district are small and marginal with landholdings less than two hectares. They can contribute substantial to livestock, vegetables and other labour-intensive allied farm activities. Group farming has a large scope to increase their income.

- Many farmers adopted organic and natural farming in the district. Still, there is a scope to increase organic farming. Organic farming should be encouraged to boost soil health, reduce water-use and ensure ecological, economic and social sustainability of agriculture. It could be an economically viable option if the government builds strong marketing networks linking farmers, processors, and distributors with the easy certification process

and minimizes farmers' risk by protecting their farm income through payments of ecosystem services. A long-term system of incentive and regulation needs to be evolved to retain the existing farmers and motivate others to move towards the sustainable farming system.

- Farmers should be encouraged to grow medicinal plants like tulsi (*Ocimum tenuiflorum*), satuwa (*Paris polyphylla Sm.*), palmarosa (*Cymbopogon martinii*), mentha, and lemongrass (*Cymbopogon*).

- There is a need to develop small-scale processing units for medicinal crops, especially for tulsi and mentha.

- Mushroom cultivation and processing facilities should be developed to encourage the local farmers, which has a high monetary return.

- There is a need to develop poly houses and greenhouses, especially for flower cultivation and vegetables.

- Farmers should adopt amla or aonla (*Phyllanthus Emblica*) and ber (*Ziziphus mauritiana*) orchards in salt-affected areas.

- Advanced mechanized tools like zero-till seed cum ferti drill for sowing wheat crops and drum seeder for Rice should be used.

- The farmers should be encouraged to grow flowers such as roses, gladiolus, and marigold for commercial purposes.

- The district has scope for beekeeping and Sericulture. It should be encouraged among the farmers.

- There is a need to encourage all the farmers to use crop advisory.

- There is a need to introduce cross breed cattle and barbari breeds of goats which will increase the farmer’s income.

- Dairy-based process units should be developed.

- Farmers should be well informed about schemes like ATMA, NFSM, NHM, and RKVY to get the maximum benefit from these.

- Agriculture production is vulnerable to natural and market risks. A compulsory and subsidized crop insurance system must be adopted to protect farmers' livelihood and income.

- Farmers should use salt-tolerant varieties to boost the yield of major crops in rice-paddy cropping systems in salt-affected areas.
- There is a need to bring more area under the micro-irrigation like drip and sprinkler systems to increase the water use efficiency and crop yields especially for vegetable and fruits cultivation.
- Most of the farmers of the district are small landholders So, there is large scope for group farming to increase the farmers income.
- A large number of farmers adopted organic and natural farming in the district, still, there is a scope to increase organic farming.
- Farmers should be encouraged to grow medicinal plants like tulsi (*Ocimum tenuiflorum*), satuwa (*Paris polyphylla Sm.*), pamarosa (*Cymbopogon martinii*), mentha, and lemon grass (*Cymbopogon*).
- There is a need to develop small-scale processing units for medicinal crops especially for tulsi and mentha.
- Mushroom cultivation and processing facilities should be developed to encourage the local farmers, which has a high monetary return.
- There is a need to develop poly houses and greenhouses especially for flower cultivation and vegetables.
- Farmers should adopt amla or aonla (*Phyllanthus emblica*) and ber (*Ziziphus mauritiana*) orchards in salt-affected areas.
- Advanced mechanized tools like zero-till seed cum ferti drill for sowing wheat crops and drum seeder for rice should be used.
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- Dairy-based process units should be developed.
- Farmers should be well informed about schemes like ATMA, NFSM, NHM, and RKVY so that they can get the maximum benefit from these.

5.2. Forestry

Raebareli is located on the bank of river Ganga and Sai. According to ISFR 2019, 93.54 Sq. Km. the area of Raebareli is covered with forest. As discussed above, the forest cover of Raebareli has increased slightly as compared to the previous assessment of ISFR 2017. No major forest was found in the district. There is a wide scope of Afforestation on waste land, trees outside forest (on

the sides of the roads, banks of rivers etc.). Government can promote the afforestation, agroforestry activities by providing output based incentives.

5.2.1. Biodiversity

- It is recommended to increase plantation in the district as a very low percentage of area is under forest.

5.3. Tourism

Restoration of Historic Places

All the historical places need timely maintenance and up-gradation to remain beautiful and attractive.

Upgradation of Visitors' Amenities

- Tourists step out of their homes to enjoy the places and beauty in the world; hence, special arrangements to support tourism activities are necessary. For example, the availability of sanitiser and masks in the times of covid-19 at tourist spaces allows them to follow the protocols.
- Toilets –Repair of all the toilets will be taken up. Each bathroom to have a facility for handicapped persons. Enough number of male and female toilets at every tourist space is mandatory with a proper water, soap and cleanliness supply.
- Hand pumps –Taps are available in various places, but these are in miserable shape, and the pipelines are old. These have to be repaired and renovated. Power cut is a recurring problem in small cities. The power cut will be for about 6 to 8 hours a day.
- Rainwater shelters – Four new rainwater shelters will be constructed. More dust bins and benches are to be built. The dust bins should be placed so that at least one dust bin is available every three hundred meters so that the visitors can properly dispose of waste materials without littering the Zoo

Beautification of Ghats

- Ghats are always a tourist spot; hence good beautification and cleanliness are required to attract tourists. Benches to sit and shadow spaces with the availability of drinking water are necessary because Rae-Bareli lies in a Hot region in Uttar Pradesh, and the temperature usually remains around 30 degrees Celsius. Changing rooms for males and females who want to take a dip of Holy Ganga is required.
- Sewages should not be allowed without proper treatment of wastewater.

Maintaining heritage buildings

Regular maintenance of tourist spots and the different roads connecting it with the city's centre is necessary to provide tourists with an enjoyable experience. Information and contact details of

authentic tourist guides on the government tourism website may be helpful for tourists and encourage them to visit more places and eventually more business. Acquiring a license by local tourist guides from government bodies is generally a complex process that discourages genuine candidates from getting the license. Easy to apply and get the license can benefit tourism.

Accessibility

There is an immediate need to improve road infrastructure. The traffic flow will be boosted by good highways and approach points to a specific tourist site. Tourist sites should be connected through better road connectivity to allow tourists to enjoy their vacation.

Safety and security

The system should undoubtedly make provisions that the policies and procedures designed to ensure the safety and security of tourists are implemented effectively. For all travellers, Uttar Pradesh's image must be promoted as a safe and secure tourism destination.

Police Patrolling and easy availability of tourists can boost tourist confidence.

Promotion and selling

Cross-selling tourism hotspots in neighbouring states can assist boost tourist inflows. Package deals should be devised and implemented for the benefit of both tourists and the government. Discounts and special offers on group travel are one way to encourage visitors to bring their families along on business trips.

Development of Eco-tourism spot

Samaspur Bird Sanctuary can be developed as a tourist spot-cum-ecotourism site to promote tourism. Although in doing this Sustainability factor and disturbance to wildlife must be considered as it is an important breeding site for birds.

Appointing brand ambassador

Appointing a brand ambassador can help promote Rae-Bareli tourism even more. It is critical to capitalize on their celebrity and fan base for UP tourism to get traction and warmly receive visitors.

Cricketer ***R.P Singh*** and world-famous Urdu poet ***Munawwar Rana*** belong to Rae-Bareli and can be appointed as Brand Ambassador of the district to attract more tourism activity.

Upgrading the skills

The hospitality business should be appropriately groomed and capable of offering the best service possible to tourists. Investing in training schools will assist the young generation in concentrating on their work and acquiring the necessary skills to make the experience worthwhile. Also, training sessions for guides can benefit individual guides and help them earn livelihood and the tourism sector to embrace more tourism. These training sessions can also help know the actual number of

available tourists guides in the city. And the same information can be uploaded on the website for customer support.

- Tourists are a source of income for the natives; developing local marketplaces such as specialized malls for locally made handicrafts/ cuisine can give a place to sellers and buyers simultaneously. Usually, local markets (selling original articles) are scattered throughout the city; a specialized marketplace will help the sellers showcase their product at excellent places, and buyers can find a wide variety of ranges at the same site.
- Letting tourists know about community-based initiatives such as women-led Self-Help Groups and Social Enterprises will support tourism and such industries. As it can bring business to enterprises.
- Development of COVID 19 protocol friendly tourism packages to boost the tourism sector economy after the pandemic.
- Because the number of tourists increases/decreases according to the increase and decrease in the number of tourists in adjacent tourist spots. A circuit can be created which allows the tourist to explore the sites through a common tourist package. One package lets them visit all the important places in the adjacent districts. Transportation services can also be developed in the same manner to support tourism in neighboring cities simultaneously. So that tourists do not have to think about dropping nearby stations because of the inaccessibility of transportation facilities.
- Ghats can be developed on the verge of international standards to attract more and more foreign tourists.
- Promoting Food trail - India is known for its cuisine and there are a lot of food lovers across the world. Promoting Indian cuisine along with tourism can reap benefits in leaps and bounds. For example, *Revadi* of Lucknow is a very famous sweet.

Key Observations – Raebareli Tourism

- The number of tourists in the Raebareli is not significant due to unavailability of famous tourist spots. No religious places are situated which can attract interstate tourists.
- The average number of international tourists reaching Raebareli is 76 tourists per year (excerpted from tourist data from 2013 to 2020). The average number of domestic tourists visiting per year is less than 10000 tourists.

5.4. Wetlands

The wetlands need to be intact, but at the same time, they need to be planned wisely to support the district economically, socially and environmentally, which will lead to indirectly relieving of stress from the Ganga River to a large extent. It will also lower the local people's dependence on the Ganga River for their small-scale industry or basic daily needs. The following recommendations

and interventions are required to get valuable products and solve the issues/ challenges faced by the local people of that region.

- Sugarcane producing farmers need to learn about crop rotation as sugarcane is water-intensive and draws lots of nutrients from the soil too.
- Introduction of improved cultivars and production technologies for pulses and oilseeds.
- Diversification through introducing vegetable, mushroom, beekeeping, fruits, medicinal plants, dairy, poultry etc. for nutritional security
- It is recommended to rejuvenate and restore the water bodies of the district.
- It is recommended to promote the production of medicinal plants in the region to promote ayurvedic medicine, and wetland can support the water supply for the cultivation.
- It is recommended to promote eco-tourism in the region as the region can develop with flower gardens around the wetlands area and biodiversity.

5.5. Energy

5.5.1. Solar

The solar energy is still at the native stage in the district Raebareli and requires a full-fledged plan for it to develop. Awareness among people not only about solar energy but also about the policies is important. Kusum Yojana and the National Solar Mission should be promoted among the people. Policies for the industrial sector are also required to be planned so that they could also benefit from it and an overall sustainable development takes place in the district.

5.5.2. Biomass

The district RaeBareli produces a lot of agricultural residue but does not have means to consume it. Hence many times farmers have to burn the residue unwantedly. The State Government's Biomass Based gasifier Power Project is best suited for the district. But before that people should be made aware of the problems that arise due to burning of farm stubble. Hence if proper infrastructure is developed which works towards bio-energy generation then the district's economy would flourish and there will be sustainable development improving the livelihood of the people.

5.5.3. Biogas

- Inspection should be done to maintain cow shelters regularly. Biogas plants in areas Kheer's Akoharia, Gonamau, Merui's cowshed, Rahi's Belakhara should be made.
- M/s Nandganj Sirohi Sugar Mill Ltd., Dariyapur, Raebareli should construct a biogas plant near the industry.

5.5.4. Hydropower

- It is recommended to build a new multipurpose canal on river Ganga or Sai so that water would remain throughout the year in the district.

16. Discussion during the Report Presentation

- Promoting farming of dragon fruits
- Famous for Bamboo products. Rae Bareilly is also sometimes referred as Bans-Bareilly (Bans in Hindi Means Bamboo).
- Suraha Tal Lake can be managed better to maintain migratory birds and developed into a tourist attraction.
- Suraha Tal Lake helps maintain water table in the region, provide water for rice cultivation, and is tourist attraction but not managed properly (waste, safety, boat overturning incidents, etc.)
- Famous for its camphor industry. Rae Bareilly is the largest producer and exporter of camphor in India.
- Rae Bareilly is famous for Zari embroidery style that started in the 16th century.
- 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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Samaspur Bird Sanctuary Raebareli, Samaspur Sanctuary Location (raebarelionline.in)

District Raebareli,Goverment of Uttar Pradesh | Land of Martyrs | India

uptourism.gov.in

https://www.nativeplanet.com/rae-bareli

https://upecotourism.in/SamaspurBirdSanctuary.aspx

18 APPENDICES

Table 2 Crop production in the district.

Crop/Year	2015-16	2016-17	2017-18
Non-grain crops (Metric Tonne)	13660	24924	24475

Grain crops (Metric Tonne)	582203	671612	677407
Sugarcane (Metric Tonne)	91518	191189	124563
Potato (Metric Tonne)	65285	68485	66366

Table 3 Livestock population in the district.

Livestock	2003	2007	2012
Cattle (Cow)	525815	449637	393872
Buffalos	312157	279774	331419
Sheep	38804	35149	18576
Goat	288458	277183	231258
Pigs	137495	94377	62245
Chicken	152921	128424	160370
Other Poultry	4412	39345	637
Horses and Ponies	5695	5035	5234

Table 4 Biogas potential from 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^3)	Biogas potential (m^3/yr)
Cattle	Manure	393872	10	1,43,76,32,800	1078224600	215644920	25	8625796.8
Buffalo	Manure	331419	15	1,81,45,19,025	1360889269	272177853.8	25	10887114.15
Sheep	Manure	18576	1	67,80,240	5085180	1017036	25	40681.44
Goat	Manure	231258	1	8,44,09,170	63306877.5	12661375.5	25	506455.02
Pig	Manure	62245	2.5	5,67,98,563	42598921.88	8519784.375	25	340791.375
Poultry	manure	1,61,007	0.1	58,76,756	4407566.625	881513.325	25	35260.533
Total		**11,98,377**						**20436099.32**

Table 5 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 [m3/(tons of dry matter)]	Overall biogas potential (m3)
Maize	straw	237	1.5	355.5	248.85	15	211.5225	800	169218
Wheat	straw	444982	1.5	667473	467231.1	30	327061.77	800	261649416
Sugarcane	Bagasse	124563	0.33	41105.79	28774.053	80	5754.8106	750	4316107.95
Total		**569782**							**266134742**

S.No	Broad objectives / recommendations	Key activities / interventions to be planned			Monitoring & Evaluation	Impact
		2022	2023	2024		
	Ntpc dumps do not impact the ecosystem of the district and Samaspur bird sanctuary. Develop Raebareli as an integrated tourist centre with neighbouring District Lucknow. Upgradation of UP state tourism corporation policies, the hotels and integration of PPP. Development of Ghat	Research to figure out the factors impacting the tourism in the district. Training of manpower. Intensive Marketing Development of strategies to address the issue. Structural developments. Environment impact Assessment to check the impact of NTPC	Implementation of strategies. Development of policies based on EIA. Inspection of NTPC dump, if it has impact on Samaspur wildlife sanctuary. Structural developments	Sampling for analysis. Evaluation of interventions. Redesigning of strategies based on Impact analysis	Intervention impact-RCTs, regression analysis, propensity scores, econometrics, structural equation modelling, Contribution analysis, process tracing, Bradford Hill criteria. Environment Impact Assessment	Trained youth to be a part of Tourism industry. Less impact due to NTPC Upgraded staff and facilities associated with UP State Tourism Corporation. More number of tourist footfalls

		dump on Ganga River and wildlife sanctuary				