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Trends and a statistical evaluation of demographic change and population growth of Uttar Pradesh

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Abstract

The present research set out to examine inequalities in service and facility provision by region in the Indian state of Uttar Pradesh in 2009, the most current year for which statistics are available. The huge population and dubious reputation of having India's lowest Human Development Index (HDI) make Uttar Pradesh a state that deserves investigation. The current research used a number of economic indicators, including changes in their rankings, to look at the pattern of economic development inequality at the district level. Measures of urbanization and per capita income showed the second-highest increases in inequality, while measures of primary sector share showed the greatest increases. Although income and urbanization are key development indicators, they also reveal widening income gaps across districts, which causes the state's economy to grow in an uneven fashion. Many earlier investigations reached the same conclusion; thus, this finding should not be shocking. In terms of economic inequality, the other indices are moving in the same direction, with the percentage of industrial workers showing the greatest decline.

Keywords: Trend, demographic, population, growth, human development index

Introduction

Compared to other Indian states, Uttar Pradesh is unique in several respects. The location is ideal, the infrastructure is good, the history is illustrious, the culture is rich, the social impact is enormous, and the politics are fierce. However, economically, it has fallen behind in the development race, despite having all these niceties and potentials. By an administrative metric, the whole state is subdivided into seventy districts, with each division subdivided into seventeen. The 813 development blocks have been used to organize the settlements. Regarding economics, the Western area has 26, 10, and 27 districts, while the Central region has 8, and the Eastern region has 7. The same holds true for Bundelkhand. Attached to this document are the key indicators that demonstrate the development level of U.P., as well as a list of the districts that fall under each administrative division and economic area.

Physical Divisions

There were three geographical and physical divisions within Uttar Pradesh before the creation of the state of Uttarakhand: the northern Himalayan area, the central Gangetic plain, and the southern Peninsular region. Nevertheless, the sub-Himalayan zone, which includes the Bhabhar and Terai regions, was entirely separated from the Himalayan area when the new state of Uttarakhand was established.

Across the Gangetic Plain: The Ganga and its tributaries form the Gangetic Plain, which encompasses about two-thirds of Uttar Pradesh. It consists of Clay and sand layers from the last few hundred years and a Pleistocene alluvial tract. All of the plain land outside the Terai and Bhabhar belts typically has a height of 80–250 meters. With the exception of the northern portion of Saharanpur district, which is situated at the base of the Siwalik range, the whole region is situated below 300 meters above sea level. On the eastern extremity of the Arawalli hills, there are various ravines and red-stone hillocks, but otherwise the whole region is flat save for the trans-Yamuna, Agra, and Mathura districts. The plain stretches east to north in the east and descends north to south in the west. Rivers such as the Yamuna, Ganga, Gomti, and Ghaghra also contribute to the watering of the plain.

The Area Below the Himalayas

The Terai Bhabar and Siwalik foothill zones make up the sub-Himalayan zone. Freshwater deposits dating back to the middle Miocene to lower Pleistocene are found in the Siwaliks of the outer Himalayas, which are situated just below and between the Bias and the upper Ganga. This folding and faulting belt is basic in nature and continues across the Himalayan foothills. Pilibhit, Saharanpur, and Bijnor comprise the Bhabar skirt. Here, floods and torrents that have been roaring down from the highlands calm down, depositing rocks that they carried with them. Despite becoming narrower as, one moves eastward, the tract is 34 km broad in the west. In the piedmont plain of Bhabar, fine and coarse pebbles are combined with extraordinarily permeable debris, and the smaller rivers and streams of the Himalayas go underground until they surface again to form the swampy Terai. From the southern edge of Bhabar, the marshy Terai stretches out into the distance. The Terai was formed by the combination of subsoil and extreme precipitation.

Tall grasses and dense trees cover it. Once upon a time, the Terai region was 80–90 km broad. A brief stretch of Terai region borders the following districts: Northern Saharanpur, Bijnor, Rampur, Bareilly, Pilibhit, Kheri, Behraich, Gonda, Basti, Siddharth Nagar, Gorakhpur, Mahrajganj, Deoria, and Padrona. The State Government's land purchase effort in recent years has significantly reduced the breadth of the Terai belt. Terai and Bhabar regions rely on rice, wheat, and sugarcane as their primary crops.

Literature Review

Adnan Shakeel *et al*. (2020) [1] The anticipated peak demand for pulses is twenty million metric tonnes in the year 2020 A.D. Determine the source of the standstill and resolve it to improve the area and production under pulses. Additionally, it will examine the data for any regional inconsistencies. When we compare the area and production variations of pulses with main grains, we may get a good idea of the development direction. Finally, the investigation indicated that, with the exception of lentil and black gramme, pulse production and area had both decreased over the study period.

Avadhesh Koshal *et al*. (2016) [2] There is just 1.8% variation in rainfall over a hundred years, according to the trend analysis in XLSTAT 2014.6.02 rev., with a R 2 value of only 0.018. Annual rainfall is showing a negative trend or going to decrease pattern, with an estimated coefficient of skewness of -0.06. Years 1935–1944 had the highest standard deviation and CV(%) at 210 and 23%, whereas years 1995–2004 had the lowest at 80.7 and 10%. The heaviest downpour, 1328.9 mm, occurred between 1955 and 1964, while the driest downpour, 493.9 mm, occurred between 2005 and 2014. An estimated 893 millimetres of rain might fall in 2021. Interpolation and kriging are part of the geostatistical analysis that makes use of the ARCGIS 10.3.1 module. Examining the pattern of yearly rainfall, both historically and going forward, is the primary goal of this research.

Raneesh Kolladi (2017) [3] The results show that the maximum rainfall for each day and month are highly correlated with one another. The data is also subjected to a linear regression analysis, which yields significant results across the whole seven months. Coefficients of variation (CV), relative variability (RV), and percentage inter-annual variability (PIV) all showed some variance in their average values, along with other significant statistical markers. On the other hand, the ratios of their respective maximum daily rainfall and mean monthly rainfall are much lower.

Pablo De Amorim Borges *et al*. (2015) [4] We tested eight distinct spatial interpolation algorithms using annual and seasonal precipitation data (1971–2000) from 54 rain gauges in Central Brazil and 6 meteorological stations. Because geographical variables such as height, longitude, and latitude account for a significant amount of the region's precipitation, multivariate models were included. In regions with sparse observation networks, however, estimates should be improved by adding geographical variables to the interpolation algorithm. It is essential to remember the supplementary qualitative data offered by uncertainty assessments performed using geostatistical approaches when attempting to understand the spatial distribution of rainfall.

Partha Pratim Roy (2016) [5] This research aims to examine the patterns and fluctuations in rainfall occurrences caused by the southwest monsoon throughout several districts in North Bengal, both in terms of space and time. March–May is the pre-monsoon season, June–September is monsoon season, and October–December is post-monsoon season. These three distinct seasons define the region. Statistical methods such as regression slopes and coefficients of variation have been used to illustrate the diversity in rainfall patterns. on order to make things clearer, the findings are shown on GIS-based maps that highlight the uneven distribution of rainfall over the area. Previous findings that weather occurrence frequencies are altering due to regional climate change are confirmed by this study.

Materials and Methods

The methodology is a crucial part of every scientific study. It details the study's methodology, including the methods used, their sequence, and whether or not they were acceptable. By following the process, the investigator is able to approach the topic in a systematic and meaningful manner. To put it simply, research design is a method for creating maps. A research proposal essentially lays out the study question(s) and the strategies for collecting, evaluating, and reporting on the necessary data.

For this research, a district is the appropriate spatial unit to use. The lack of time series data for all of the newly constituted tehsils and districts was the most serious issue, while using a taluka (tehsil) instead of a district was also an intriguing alternative. Consequently, 70 districts will participate in this research. Furthermore, considering the present data availability and the fact that districts in Uttar Pradesh and India remain the centre of administrative decision-making, planning, implementation, and monitoring, the district was considered the most suitable unit of analysis for the task at hand. The state administration has also decentralized planning to the districts in 1982 and 1983, and since then, they've established a new balanced development plan. Although a district was used as the analytical unit, the findings may still be understood on a regional scale.

Results and Discussion

Estimation of composite index of development

The study relies on data that are reported from distinct populations and quantified in different units. Consequently, a composite indicator of agricultural growth has been produced by first standardizing the variables that are being considered. Because some indicators have a positive impact on development and others a negative one, it is necessary to determine the ideal standardized value (minimum or maximum) for each indicator and the deviations of different indicators from the corresponding optimum variables for each indicator. This process yields a non-negative result for the composite index that falls anywhere between zero and one. The closer the index number is to zero, the more developed a society is, and the further away from one it is, the less developed it is.

Table 1: Estimation of composite index of development

Districts	Periods								
	Period-I (2002-03)			Period-II (2010-11)			Period-III (2017-18)		
	C.I.	N. I.	Rank	C.I.	N. I.	Rank	C.I.	N. I.	Rank
Agra	0.7505	0.6989	32	0.8472	0.6395	28	0.8468	0.7543	21
Amroha	0.7494	0.7010	31	0.8696	0.5787	42	0.8373	0.7868	15
Aligarh	0.6597	0.8741	3	0.8543	0.6203	34	0.8504	0.7421	23
Auraiya	0.7638	0.6733	34	0.8055	0.7529	12	0.8329	0.8018	12
Allahabad	0.7858	0.6308	39	0.8358	0.6706	25	0.9111	0.5358	53
Ayodhya	0.7324	0.7338	22	0.8242	0.7021	18	0.8812	0.6374	38
Ambd. Ngr.	0.7786	0.6447	37	0.8190	0.7162	17	0.8444	0.7625	19
Amethi	0.8753	0.4583	60	0.9794	0.2803	71	0.8565	0.7214	28
Azamgarh	0.8740	0.4608	59	0.9318	0.4096	66	0.9162	0.5184	54
Barabanki	0.7358	0.7272	23	0.8296	0.6874	23	0.8671	0.6854	32
Bahraich	0.8095	0.5852	47	0.9236	0.4320	64	0.8905	0.6059	44
Balrampur	0.9342	0.3447	69	0.8699	0.5778	43	0.9275	0.4799	62
Basti	0.7441	0.7113	29	0.8600	0.6046	36	0.9191	0.5084	56
Balia	0.8388	0.5287	51	0.8875	0.5301	51	0.8653	0.6915	31
Banda	0.9694	0.2768	70	0.9858	0.2627	73	0.9930	0.2574	72
Badayun	0.7068	0.7833	14	0.8525	0.6252	33	0.8563	0.7219	27
Bareily	0.7401	0.7190	27	0.8639	0.5943	39	0.8833	0.6302	39
Baghpat	0.6859	0.8235	9	0.8020	0.7623	9	0.8089	0.8831	4
Bulandshahar.	0.5944	1	1	0.8288	0.6895	21	0.7936	0.9352	2
Bijnor	0.7760	0.6498	36	0.8622	0.5986	37	0.8262	0.8244	9
Chandauli	0.8699	0.4686	58	0.9165	0.4512	62	0.9319	0.4650	63
Chitrakoot	0.9962	0.1615	74	0.9962	0.1163	74	0.9982	0.0000	75
Deoria	0.7231	0.7518	19	0.8428	0.6515	26	0.9258	0.4858	61
Etawah	0.7540	0.6921	33	0.7815	0.8182	5	0.8392	0.7802	17
Etah	0.7021	0.7922	11	0.8095	0.7420	14	0.8478	0.7509	22
Farukhabad.	0.6741	0.8461	6	0.7466	0.9130	2	0.8529	0.7338	26
Fatehpur	0.7936	0.6158	43	0.8841	0.5391	49	0.9808	0.2987	69
Firozabad	0.7376	0.7237	26	0.8674	0.5847	40	0.8626	0.7007	30
G.B. Nagar.	0.8407	0.5249	52	0.7776	0.8287	4	0.7746	1	1
Gorakhpur	0.7790	0.6439	38	0.8841	0.5391	48	0.9409	0.4343	64
Gonda	0.8616	0.4846	57	0.8519	0.6267	32	0.8383	0.7835	16
Ghaziabad	0.6697	0.8547	5	0.7146	1	1	0.8286	0.8163	10
Ghazipur	0.7756	0.6506	35	0.8731	0.5690	44	0.8928	0.5980	47
Hapur	0.7418	0.7157	28	0.8278	0.6923	20	0.8523	0.7358	25
Hathras	0.7129	0.7714	15	0.8273	0.6937	19	0.8425	0.7691	18
Hardoi	0.7975	0.6082	44	0.8742	0.5662	45	0.8797	0.6425	37
Hamirpur	0.9952	0.1781	72	0.9635	0.3235	68	0.9171	0.5153	55
Jalaun	0.9201	0.3719	66	0.9037	0.4860	57	0.8948	0.5911	48
Jaunpur	0.7867	0.6292	40	0.9231	0.4333	63	0.8966	0.5849	50
Jhansi	0.9232	0.3659	68	0.9066	0.4780	58	0.9231	0.4949	60
Kasganj	0.7163	0.7648	17	0.8597	0.6056	35	0.8078	0.8871	3
Kannauj	0.6806	0.8338	8	0.7841	0.8111	7	0.9105	0.5379	52
Kanpur (D)	0.7324	0.7339	21	0.8055	0.7530	11	0.8344	0.7966	13
Kanpur (N)	0.7469	0.7058	30	0.8048	0.7548	10	0.8887	0.6118	42
Kheri	0.7987	0.6059	45	0.8799	0.5507	47	0.8744	0.6606	34
Kausambi	0.9225	0.3672	67	0.9136	0.4591	61	0.8949	0.5908	49
Kushinagar	0.7876	0.6273	41	0.8788	0.5536	46	0.9223	0.4975	57
Lalitpur	0.9942	0.2290	71	0.9658	0.3172	69	0.9875	0.2759	71
Lucknow	0.8212	0.5625	49	0.8481	0.6371	29	0.9453	0.4196	65
Mathura	0.7022	0.7921	12	0.8340	0.6755	24	0.8363	0.7900	14
Mainpuri	0.6754	0.8438	7	0.7971	0.7756	8	0.8444	0.7624	20
Mahoba	0.9958	0.1626	73	0.9840	0.1489	72	0.9839	0.2884	70

Mau	0.8143	0.5758	48	0.8894	0.5248	54	0.8924	0.5992	46
Mahrajganj	0.8034	0.5969	46	0.8694	0.5792	41	0.8895	0.6091	43
Meerut	0.6589	0.8756	2	0.7835	0.8127	6	0.8139	0.8663	5
Mirzapur	0.8960	0.4184	64	0.9553	0.3458	67	0.9942	0.2533	73
Moradabad	0.7263	0.7457	20	0.8088	0.7440	13	0.8510	0.7402	24
Muzzafarnagar.	0.6670	0.8600	4	0.8185	0.7176	16	0.8322	0.8040	11
Pratapgarh	0.8883	0.4332	62	0.8997	0.4967	56	0.9807	0.2990	68
Pilibhit	0.7195	0.7587	18	0.8184	0.7179	15	0.8881	0.6140	41
Rampur	0.7157	0.7661	16	0.8882	0.5281	52	0.8151	0.8621	6
Raebareli	0.8496	0.5079	54	0.8894	0.5248	53	0.9646	0.3538	67
Shahjahanpur	0.7365	0.7258	24	0.8294	0.6879	22	0.8721	0.6684	33
Sharanpur	0.6969	0.8023	10	0.8634	0.5956	38	0.8170	0.8556	8
Sambhal	0.8499	0.5073	55	0.9094	0.4705	59	0.8868	0.6184	40
Siddharth Nagar	0.8479	0.5111	53	0.8940	0.5124	55	0.8911	0.6039	45
Sitapur	0.8299	0.5458	50	0.8848	0.5374	50	0.8755	0.6569	36
Shamli	0.7370	0.7250	25	0.8483	0.6365	30	0.8154	0.8610	7
Shrawasti	0.8888	0.4323	63	0.9685	0.3098	70	0.9472	0.4130	66
Sonbhadra	0.9972	0.0000	75	0.9952	0.0000	75	0.9972	0.1294	74
S.K. Nagar	0.8524	0.5023	56	0.9101	0.4684	60	0.9224	0.4974	58
SRD. Nagar	0.7928	0.6172	42	0.8462	0.6423	27	0.8754	0.6573	35
Sultanpur	0.8805	0.4482	61	0.8517	0.6274	31	0.9024	0.5653	51
Unnao	0.9100	0.3913	65	0.9250	0.4281	65	0.9225	0.4971	59
Varanasi	0.7048	0.7870	13	0.7548	0.8908	3	0.8582	0.7158	29
Mean	0.7974			0.8685			0.8862		
C.V.	12.701			7.569			6.4155		

Trends and Status of Demographic Change and Population Growth in Uttar Pradesh

The most populated state in India, Uttar Pradesh, is home to more than 16.4 percent of the country's total population. With an area equal to 6.88 percent of the nation, it is the fourth largest state in terms of landmass. There are 200 million people living in 75 districts over the 2,43,290 square Kilometers that make up the state. There are also 901 development blocks. State population density is 829 people per km², much higher than the national average. There were 8.8 crores of people living in the state in 1971. The figure jumped to 19.9 crores in 2023 from 11.1 crores in 1981. The percentage of the population that grew throughout these two decades was almost the same, at 25%. This is in contrast to the national population trend, which fell from 25% in 1971–1981 to 23.8 percent in 1981–1991 and then fell by 20.0 percent over the decade beginning in 2003 and ending in 2023. When represented as a proportion of the population, its growth rate is still greater than the US average.

In recent years, the state's urbanization rate has been declining. Equally moderate has been the pace of urbanization in comparison to other states. The number of cities with populations more than one lakh has been steadily rising over the last 30 years. Conversely, urban centers with populations below 5,000 have grown more rapidly, with the greatest concentration of these centers in the state's western area.

Although it continues to employ 73% of the workforce, the primary sector's share of state revenue has dropped to 41% according to the income structure. This is a prime example of the working class's ongoing demands in the agriculture industry. In contrast, the secondary sector generates 20% of the state's revenue and employs 9% of the population. Capital, not labor, has been the engine that has propelled Uttar Pradesh's growth, and the state's economy has been moving away from rural and into urban centers, claims. Additionally, there has been no matching change in employment patterns, suggesting that income has shifted from primary to secondary industries.

It is easy to see the economic gaps across the various parts of Uttar Pradesh. By examining factors such as agricultural output, infrastructure facilities, industrial growth, Ruhelkhand and Hill, we may identify the five sectors of Uttar Pradesh's economy. Western Uttar Pradesh's agricultural industry is doing quite well. It has had a higher level of urbanization and is somewhat industrialized. Next to it is Bundelkhand. Because of its few industrial units, poor gross value of industrial production, and undeveloped agricultural sector, his region claims the lowest degree of development in the state.

Among the sixteen largest states, the state ranks thirteenth or fourteenth according to almost all social indices. U.P. is the most developed state in the country when it comes to social indicators such as healthcare facilities, literacy rate, per capita income, number of villages electrified, per capita electricity consumption, etc. Second only to U.P. in importance is Bihar, and on occasion Orissa too. Uttar Pradesh, a state in India, is a model for how other parts of the country could develop economically and socially due to its higher standard of living and lower poverty rate than the national average. The Indian states of Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan are all part of it. Each of these four states is unique. While each of these four states has its own unique history of social and economic development, new comparative study has shown that the underlying causes of their backwardness have many commonalities in their political, cultural, and social structures.

Uttar Pradesh is a place of brief and unpredictable lives. With a death rate of up to 141 per thousand, the average lifespan of a female is less than 55 years. Uttar Pradesh is involved in these areas. Bihar ranks first. The poor odds of a child's survival in Uttar Pradesh are supported and explained by this to a considerable degree. Additionally, U.P.'s demographic shift has been somewhat gradual. According to Arnold *et al*. (2009) [6], all major Indian states have different birth and fertility rates, but Uttar Pradesh has the highest of the bunch.

Difficult issues plague the educational system. The school is in shambles because the public doesn't care; privately managed schools are better, but they're out of reach for most people. It is the goal of the state government to have all citizens able to read and write. Programs such as DPEP, which was supported by the World Bank, are available. Efforts are being made to increase public engagement with the support of non-governmental organizations and other groups. Among Uttar Pradesh's higher education and technical institutions, you'll find a plethora of polytechnics, engineering schools, and industrial training centres, in addition to 16 general universities, 3 technical universities, an IIT (Kanpur), an IIMS (Lucknow), and a IIITS (Indian Institute of Information Technology). With everything in place, the state can confidently offer its young people the chance to pursue higher education.

Population Growth Rate

The Indian state with the most population is Uttar Pradesh. Table 1 displays the population data of Uttar Pradesh and India from 1901 to 2023. The percentage of the population in Uttar Pradesh rose from 16.62 crore in the 2003 census to 19.98 crore in 2023, according to the 2023 census. The 2023 census revealed that the overall population of Uttar Pradesh was 19.96 crore, which was an increase from 16,62 crore in 2003. The overall population rose by 20.23% in this decade, which is lower than the 25.70% increase in the previous decade. One sixteenth of India's total population lived in Uttar Pradesh in 2023. The same percentage in 2003 was 16.16%. There was a wide range of population growth rates from 1901 and the present, as seen in Table 1. From 4,86 million in 1901 to 16,62 million in 2023, the population of Uttar Pradesh increased dramatically. The national population has grown by five times in the past century, whereas the population of the state has grown by 4.1. Separating the years 1901–1951 and 1951–2023 reveals that the state's population grew by only 30% between those two points in time. Furthermore, the population grew at an exceptionally rapid pace of 216% during the second era, that is, from 1951 to 2023. This finding indicates that the pace of population increase was greater after independence than it had been before. Alternatively, over both time periods, the population growth rate of Uttar Pradesh was lower than the national average.

After a poor start, the decade growth rate began to climb, as we discovered. Uttar Pradesh's population growth rate has been consistently increasing since 1951, as seen in tables 1 and 2. The population has been increasing at a pace of above 20% every decade since 1981. This is already a major problem, and it will only become worse. The yearly population growth rate was 1.1% from 1951 to 2003; however, it surpassed 2% from 1981 to 2003. Although it was greater in 2003 and 2010, the population growth rate has since declined.

Our investigation into the disparity between the national average and the rate of population growth in Uttar Pradesh yielded some interesting findings. Between the 1901 and 1971 censuses, the population of Uttar Pradesh grew at a slower pace than the rest of the country. Furthermore, the difference was more pronounced. At the national level, the population has grown by 5.7% since 1911, while at the local level, it has shrunk. Similarly, compared to the national average, Uttar Pradesh's population grew by 4-5 percent in 1931, 1961, and 1971. However, although the national population growth rate has been trending downward since 1981, Uttar Pradesh's rate has been steadily rising year after year. Furthermore, by examining the state's percentage of India's total population, one may ascertain the pace of population increase in Uttar Pradesh relative to the country overall. During the first era, Uttar Pradesh's percentage share on the national level was lower because of the slower pace of population increase. Twenty.39% of the population lived in Uttar Pradesh in 1901, a decrease of 16.10% from 1971. However, the percentage of the overall population that resides in Uttar Pradesh shows a little uptick after that.

Table 2: Uttar Pradesh's and India's Population Growth Rate (1901 to 2023)

Years	Uttar Pradesh (Lakhs)	India (Lakhs)	Share of Uttar Pradesh in India (%)	Decadal Growth Rate (%)	
				Uttar Pradesh	India
1901	486	2384	20.39	--	--
1911	482	2521	19.12	(-0.97)	(+5.75)
1921	467	2513	18.58	(-3.08)	(-0.31)
1931	498	2790	17.85	(+6.66)	(+11.00)
1941	565	3187	17.73	(+13.57)	(+14.22)
1951	632	3611	17.50	(+11.82)	(+13.31)
1961	737	4392	16.78	(+16.66)	(+21.51)
1971	883	5482	16.11	(+19.78)	(+24.80)
1981	1109	6833	16.23	(+25.49)	(+24.64)
1991	1320	8463	15.60	(+25.55)	(+23.86)
2001	1662	10286	16.16	(+25.80)	(+21.34)
2011	1996	12102	16.49	(+20.09)	(+17.64)

***Source*:** Census of India, www.censusindia.gov.in

Tables 3: Upward Trends in Uttar Pradesh's Population (1901 to 2023)

Years	Population (Lakhs)	Annual Growth Rate (%)
1901	486	-
1911	482	-0.08
1921	467	-0.32
1931	498	0.64
1941	565	1.27
1951	632	1.13
1961	738	1.56
1971	883	1.81
1981	1109	2.31
1991	1320	2.29
2001	1662	2.33
2011	1996	1.85

***Source*:** Census of India, www.censusindia.gov.in

Population Density and Sex Ratio

A highly populated city can almost never have good government, according to history. Just as with other things (plants, animals, instruments), there is a limit to how big a state can be; at either extreme, its inherent strength is diminished. "Density of Population" refers to the amount of people living in relation to one square kilometre. Because it reveals how concentrated people are in one location, it is a crucial indicator of population size. There are now 382 people per square kilometre in India, up from 325 in 2003, according to the 2023 census. There are now 57 more individuals living in the nation per square Kilometre than there were ten years ago. There were 828 people per square mile in the state in 2023, up from 690 in 2003. As a result, it grew at a faster rate than the national average, reaching 828 people per square Kilometre in 2023. This is an increase of 17.5% from 2003 levels.

Conclusion

With over half of the population working in agriculture, the sector is vital to Uttar Pradesh's economy. It also contributes over 25% to the state's GDP. The largest Indian state, Uttar Pradesh, was responsible for 18.9% of India's grain production, 8.65% of its pulse production, 3.65% of its oilseed production, and 46.56% of its sugarcane production in 2017 and 2018. Total gross value added and agricultural productivity are two indicators of agricultural growth performance that this research seeks to examine. Furthermore, appropriate tools have been used to determine the phases of agricultural growth. Clustering of districts according to agricultural development indicators and geographical variations in agricultural production have been completed. Research showed that agricultural productivity and the agricultural sector's growth tendencies were volatile, with a downward tendency lasting all the way until the conclusion of the 2008–09 decade. The growth tendency then began to rise, and it continued to rise until the conclusion of the decade in 2013–14. Afterwards, there was a drop in the growth trend, followed by an increasing tendency.

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