

ASPIRATIONAL DISTRICTS IN BIHAR:

Are Poorer Districts are catching up with Rich Districts?

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Abstract-

NITI Aayog is currently anchoring the "Transformation of Aspirational districts" program with the support of central ministries and state governments. This programme helps the "Aspirational districts" catching up with rich districts or frontier districts within the own states and rich districts of the neighbours states and further, became the one of the rich districts of India. Bihar is the poorest state in India. There are so many reasons, why the Bihar is the poorest state in India like high population, low literacy rate and unskilled youth etc. The poor districts of Bihar are catching up with rich districts or not. Why they are so poor and what are Government schemes who will help the poor districts. So, this paper is all about the Aspirational districts of Bihar and what are the parameters on that some of the districts comes in aspirational category. What are the indicators of the Aspirational districts? Is they are catching up with rich districts within the same states (i.e. Bihar) or neighbours states, using the unconditional convergence with spatial model. How the poor districts will catch up with rich districts or frontier districts.

Keywords: Aspirational districts, spatial convergence, rich, poor, Bihar, GDP.

1. Introduction

Aspirational districts are those districts in India, which are affected by the poor socio-economic indicators i.e. health, education, agriculture etc. These are aspirational in the context that improvement in these districts can lead to the overall improvement in human development and economy of India. The "Transformation of Aspirational districts" program aim to expeditiously improve the socio-economic status of 117 districts from across 28 states in India. The three main principles of the programme are **Convergence** (of central & state schemes), **Collaboration** (among citizens and functionaries of central & state governments including district teams), and **Competition** among districts. Driven primarily by the states, this initiative focuses on the strengths of each district and prioritizes the attainable outcomes for immediate improvement.

The "Transformation of Aspirational districts" programme is taking account of all the strength and weakness of each and every districts use their strength as well as minimising the weakness part improve the status of economy. The programme focuses on 5 main areas -

- ✓ **Health & Nutrition**
- ✓ **Education**
- ✓ **Agriculture & Water Resources**
- ✓ **Basic Infrastructure**
- ✓ **Financial Inclusion & Skill development**

These 5 focus areas have direct affect on the quality of life of every individual as well as economy of India. NITI Aayog divides the proper weightage for focus area and total of 49 indicators (87 points) for all focus area.

Aspirational districts in Bihar – Bihar have the total of 38 districts. Out of 38, 13 districts came in aspirational category are following:-

- | | | |
|---------------|----------------|----------------|
| 1. Araria | 6. Jamui | 11. Purnia |
| 2. Aurangabad | 7. Katihar | 12. Sheikhpura |
| 3. Banka | 8. Khagaria | 13. Sitamarhi |
| 4. Begusarai | 9. Muzaffarpur | |
| 5. Gaya | 10. Nawada | |



** Green part denotes 13 Aspirational districts of Bihar.

2. Objective-

- How the districts are identified as aspirational districts and what are the key performance indicators of “Aspirational District Programme”?
- Is the poor districts are catching up with rich or frontier districts in Bihar?
- Mapping of the data of different factors on Bihar map.

2.1. Identification of Aspirational Districts –

It is very important to mention that aspirational districts are not most backward districts of states according to GDDP or literacy rate or agricultural productivity or infrastructure etc. But they are those districts which can easily catch up with rich or frontier districts if government provide some help. So, some of the underdeveloped districts excluded from the aspirational category and some developed districts came in category of aspirational. Ex- As per the latest data, Madhubani is the poorest district of Bihar but it is not included in aspirational category. Madhepura, Arwal are also not included in the category of aspirational but they have less per capita income than others who included in the list of aspirational.

2.2. Key performance indicators –

(1) Health & Nutrition (30%) – Health and Nutrition is one of the most important key for the human development index and development of the districts as well as country. A healthy person can achieve anything in life. Health is directly proportional to the nutrition. Nutrients food always helps us in the well being. According to our father of nation Mahatma Gandhi, "*It is health that is real wealth and not pieces of gold and silver*". Without good health, No one can imagine our life. Under the TADP program, Health & Nutrition have weightage of 30% of overall with 13 indicators (31 points).

The Indicators broadly covers –

- ✓ About maternal health, new born health, child health and nutrition etc.
- ✓ About Health infrastructure and IPHS standard, anemia, TB and its treatment, immunization, village health and nutrition day etc.

MoHFS, HMIS, Survey Agency and Tata trusts is taking care and monitoring the following indicators –

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation check
1.1	Percentage of pregnant women receiving 4 or more antenatal care check-ups to the total no. of pregnant women registered for antenatal care	0.60%	Annually	DC/DM	HMIS, MoHFW	Yes
1.2	Percentage of ANC registered within the first trimester against Total ANC Registration	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes
1.3	Percentage of pregnant women (PWs) registered for ANCs to total estimated pregnancies	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes
2	Percentage of pregnant women regularly taking Supplementary Nutrition under the ICDS programme	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes

3.1	Percentage of Pregnant women having severe anaemia treated, against PW having severe anaemia tested cases	1.50%	Monthly	DC/DM	HMIS, MoHFW	No
3.2	Percentage of pregnant women tested for Haemoglobin 4 or more times in respective ANCs to total ANC registration	1.20%	Annually	DC/DM	HMIS, MoHFW	Yes
4.1	Sex ratio at birth	0.90%	Monthly	DC/DM	HMIS, MoHFW	No
4.2	Percentage of institutional deliveries to total estimated deliveries	1.20%	Monthly	DC/DM	HMIS, MoHFW	Yes
5	Percentage of deliveries at home attended by an SBA (Skilled Birth Attendance) trained health worker to total home deliveries	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes
6.1	Percentage of newborns breastfed within one hour of birth	1.20%	Monthly	DC/DM	HMIS, MoHFW	Yes
6.2	Percentage of low birth weight babies (less than 2500g)	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes
6.3	Percentage of live babies weighed at birth	0.90%	Monthly	DC/DM	HMIS, MoHFW	Yes
7	Percentage of underweight children under 5 years	2.10%	Monthly	Survey Agency	ICDS- Monthly Report	Yes
8.1	Percentage of stunted children under 5 years	0.60%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
8.2	Percentage of children under 5 years with Diarrhoea treated with ORS	0.60%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
8.3	Percentage of children under 5 years with Diarrhoea treated with Zinc	0.60%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
8.4	Percentage of children with ARI in the last 2 weeks taken to a health facility	0.60%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
9.1	Percentage of Severe Acute Malnourishment (SAM)	1.00%	Monthly	DC/DM	ICDS- Monthly Report	Yes
9.2	Percentage of Moderate Acute Malnutrition (MAM)	0.50%	Monthly	DC/DM	ICDS- Monthly Report	Yes

10.1	Percentage of Breastfeeding children receiving adequate diet (6-23 months)	1.00%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
10.2	Percentage of Non-Breastfeeding children receiving adequate diet (6-23 months)	0.50%	Quarterly	Survey Agency	Survey Agency, Tata trusts	No
11	Percentage of children fully immunized (9-11 months) (BCG+ DPT3 + OPV3 + Measles1)	3.00%	Monthly	DC/DM	HMIS, MoHFW	Yes
12.1	Tuberculosis (TB) case notification rate (Public and Private Institutions) as against estimated cases	0.75%	Monthly	DC/DM	RNTCP/ Nikshay MIS	No
12.2	TB treatment success rate among notified TB patients (public and private)	0.75%	Monthly	DC/DM	RNTCP/ Nikshay MIS	No
13.1	Proportion of sub-centres/PHCs converted into Health & Wellness Centres (HWCS)	1.80%	Quarterly	DC/DM	NHM MIS	Yes
13.2	Percentage of Primary Health Centres compliant to Indian Public Health Standards	1.50%	Quarterly	DC/DM	HMIS, MoHFW	Yes
13.3	Proportion of functional FRUs (First Referral Units) against the norm of 1 per 500,000 population (1 per 300,000 in hilly areas)	0.45%	Quarterly	DC/DM	NHM MIS	Yes
13.4	Proportion of specialist services available in District hospitals against 10 core specialist services	0.60%	Quarterly	DC/DM	HMIS, MoHFW & ICDS	No
13.5	Percentage of Anganwadis centres/Urban PHCs reported to have conducted at least one Village Health Sanitation & Nutrition day / Urban Health Sanitation & Nutrition day/ respectively in the last one month	0.60%	Quarterly	DC/DM	ICDS Monthly Progress Report	No
13.6	Proportion of Anganwadis with own buildings	0.60%	Quarterly	DC/DM	ICDS Monthly Progress Report	Yes
13.7	Percentage of First Referral Units (FRU) with labour rooms and obstetrics OT NQAS certified (meet LaQShya guidelines)	0.45%	Monthly	DC/DM	District Health Officer	Yes

(2) Education (30%) – Education is the one of the most important key for human being. With the help of education, anyone can achieve anything in life. Education can provide a suitable, peaceful and joyful life. The real education is a journey from converting the human being in to being human. So, we can understand how much education is useful and essential for us. Unless the education makes us a good human, it is like a animal without knowledge. The real education not only imparts you knowledge but the wisdom too. Under the TADP programme, Education have 30% weightage of overall with 8 indicators (14 data points).

The Indicators broadly covers –

- ✓ Transition rate, learning outcomes, literacy rate, teacher-pupil ratio, textbook availability, knowledge of mathematics and language etc.
- ✓ Infrastructure facilities at school such as toilets facilities, electricity, drinking water facilities etc.

MHRD, the nodal ministry is taking care & monitoring for educational development in the districts of India. All indicators are –

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation check
1.1	Transition rate from primary to upper primary school level	4.20%	Annually	DC/DM	MHRD-UDISE	No
1.2	Transition rate from upper primary to secondary school level	1.80%	Annually	DC/DM	MHRD-UDISE	No
2	Toilet access: percentage schools with functional girls toilets	1.50%	Monthly	DC/DM	MHRD-UDISE	Yes
3.1	Mathematics performance in class 3	15.0%	Quarterly	Survey Agency	Tests for students selected through sampling of third Party-Av. Marks obtained by a random sample of students in maths and language	No
3.2	Language performance in class 3					No
3.3	Mathematics performance in class 5					No
3.4	Language performance in class 5					No
3.5	Mathematics performance in class 8					No
3.6	Language performance in class 8					No
4	Female literacy rate (15+ age group)	2.40%	Annually	Survey agency	MHRD-UDISE	Yes
5	Percentage of schools with functional drinking water facility	1.20%	Monthly	DC/DM	MHRD-UDISE	Yes

6	Percentage of schools with functional electricity facility at secondary level	0.30%	Monthly	DC/DM	MHRD-UDISE	Yes
7	Percentage of elementary schools complying with RTE specified Pupil Teacher Ratio	2.40%	Monthly	DC/DM	MHRD-UDISE	No
8	Percentage of schools providing textbooks to children within 1 month of start of academic session	1.20%	Annually	DC/DM	MHRD-UDISE	No

(3) Agriculture & Water Resources (20%) – Agriculture & Water Resources is one of the most important factor for the humans as well as animals. Water resources are the natural resources of water that is useful for every living being. Water resources are rivers, lakes and groundwater, rainwater etc. Water is very useful for households, industrial, agricultural and environmental activities etc. Farming is the main source of income for the farmers. Under the TADP programme, Agriculture and Water resources having 20% weightage of overall with 10 indicators (18 data points).

The Indicators broadly covers –

- ✓ About Water positive investments and employments, Crop insurance, increase in critical usage supply, Mandis linked with electronic market etc.
- ✓ About Price realization (FHP, MSP), agricultural productivity, livestock health, soil health card etc.

Department of Agriculture, Cooperation and Farmer's Welfare, NARBAD and others organisation is taking care and monitoring the process of the following indicators-

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation Check
1.1	Percentage of net-sown area under micro-irrigation	3.50%	Monthly	DC/DM	Department of Agriculture, Cooperation and Farmer's Welfare	No
1.2	Number of water-bodies rejuvenated under MNREGA	2.50%	Half Yearly	DC/DM	Department of Rural Development	No
2	Crop Insurance – Kharif : Percentage of net sown area under Pradhan Mantri Fasal Bima Yojana (PMFBY)	1.50%	Half Yearly	DC/DM	Total sown area covered under PMFBY (Department of Agriculture, Cooperation, and Farmer's welfare)	No
2	Crop Insurance - Rabi: Percentage of net sown area in Rabi under Pradhan Mantri Fasal Bima Yojana (PMFBY)	1.50%	Half Yearly	DC/DM	Total sown area covered under PMFBY (Department of Agriculture, Cooperation, and Farmer's welfare)	No
3.1	Percentage increase in agricultural credit	2.00%	Half Yearly	DC/DM	NABARD	No

3.2	Certified quality seed distribution	1.50%	Half Yearly	DC/DM	Department of Agriculture, Cooperation and Farmer's Welfare	No
4	Number of Mandis in the District linked to Electronic Market	2.00%	Monthly	DC/DM	Small Farmers' Agribusiness Consortium, Department of Agriculture, Cooperation, and Farmer's welfare http://www.enam.gov.in/NAM/home/index.htm	No
5.1	Wheat: Percentage change in Price Realization (defined as the difference between Farm Harvest Price (FHP) and Minimum Support Price (MSP))	0.50%	Half Yearly	DC/DM	Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers' Welfare; Farm Harvest Prices of Principal Crops in India	No
5.2	Paddy (Common): Percentage change in Price Realization (defined as the difference between Farm Harvest Price (FHP) and Minimum Support Price (MSP))	0.25%	Half Yearly	DC/DM		Yes
5.3	Paddy (Grade A): Percentage change in Price Realization (defined as the difference between Farm Harvest Price (FHP) and Minimum Support Price (MSP))	0.25%	Half Yearly	DC/DM		Yes
6	Percentage share of high value crops to total sown area in district	0.50%	Annually	DC/DM	Department of Agriculture, Cooperation and Farmers' Welfare; Horticulture Statistics	No
7.1	Agricultural productivity of Major Crop1 in Kharif (Kg/hectare)	0.50%	Half Yearly	DC/DM	Department of Agriculture, Cooperation	No

7.1	Agricultural productivity of Major Crop2 in Kharif (Kg/hectare)	0.50%	Half Yearly	DC/DM	and Farmers' Welfare	No
7.2	Agricultural productivity of Major Crop1 in Rabi (Kg/hectare)	0.50%	Half Yearly	DC/DM		No
7.2	Agricultural productivity of Major Crop2 in Rabi (Kg/hectare)	0.50%	Half Yearly	DC/DM		No
8	Percentage of animals vaccinated	1.50%	Monthly	DC/DM	Department of Animal husbandry, Dairy and fisheries	No
9	Artificial insemination coverage	1.00%	Monthly	DC/DM		No
10	Number of Soil Health Cards distributed	0.50%	Monthly	DC/DM	Department of Agriculture, Cooperation and Farmers' Welfare	No

(4) Basic Infrastructure (10%) – Basic Infrastructure is also one of the important key for every individual. Basic Infrastructure in physical aspect means roads, electricity, bridges, sewage, tunnels, communication, mass transit etc. that are useful for everyday for everyone. If roads near our home or office or schools are not good, then we face a lot of difficulties in our everyday life. The Government is also providing the electricity in far away villages because electricity is one of the most important facility for everyone. Without electricity in present time, we cannot imagine a good and happy life. Pure drinking water is also a part of basic infrastructure. As everyone know, Drinking water is essential for every living being. Under the TADP programme, Basic Infrastructure having 10% weightage of overall with 7 indicators (8 data points).

The Indicators broadly covers –

- ✓ About electricity facility at household level, road connecting to villages constructed under PMGSY, IIHL with every household etc.
- ✓ About Purified drinking water (at <40lpcd) at every habitation, Pakka houses for shelter less, CSCs converge at GPs and internet facility at GPs level etc.

Ministry of Rural development, Ministry of Drinking water and Sanitation and other Ministries is taking care and monitoring the process of the following indicators –

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation Check
1	Percentage of households with electricity connection	2.00%	Monthly	DC/DM	Number of electrified households (estimated through Census data 2011) - Total number of households (data will be provided by State power utilities through Saubhagya portal)	No

2	Percentage of gram Panchayats with internet connection	0.50%	Monthly	DC/DM	Number of gram Panchayats with Bharatnet internet connection (Bharat Broadband Network Limited MIS/website report) - Total number of gram Panchayats (From the Census Data)	No
3.1	Percentage of habitations with access to all weather roads under PMGSY	0.75%	Monthly	DC/DM	Number of connected habitations under PMGSY (through the Ministry of Rural Development (http://omms.nic.in/)) - Total number of eligible habitations for connectivity under PMGSY (estimated through Census data 2001)	No
3.2	Cumulative number of kilometres of all-weather road work completed as a percentage of total sanctioned kilometres in the district under PMGSY	0.75%	Monthly	DC/DM	Ministry of Rural Development	No
4	Percentage of households with individual household latrines	1.50%	Monthly	Automatic generation from the Ministry website	Ministry of Drinking Water and Sanitation MIS (https://sbm.gov.in/sbmReport/home.aspx)	No
5	Percentage of rural habitations with access to adequate quantity of potable water (40 lpcd) drinking water	2.00%	Monthly	Automatic generation from the Ministry website	Ministry of Drinking Water and Sanitation MIS (http://indiawater.gov.in/imisreports/nrdwpmain.aspx)	No
6	Percentage coverage of establishment of Common Service Centres at Gram Panchayat level	0.50%	Monthly	DC/DM	Census data and Ministry of Electronics and Information Technology	No

7	Percentage of Pakka houses constructed for households that are shelterless or have one room with kachha wall and roof or have 2 rooms with Kachha wall and roof	2.00%	Monthly	DC/DM	awaassoft.nic.in (Ministry of Rural Development)	No
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(5a) Financial Inclusion (5%) - Financial Inclusion is also important for everyone because at the present time, with money, everyone fulfil their needs. Financial inclusion is defined as individuals and businesses have access to affordable and useful products and services that fulfilling their needs like savings, insurance, credit, bank accounts, loan, payment and remittance etc. Under the TADP programme, Financial Inclusion having 5% weightage of overall with 6 indicators (6 points).

The Indicators broadly covers –

- ✓ About disbursement of Mudra-loan, PMJJBY, PMSBY and ABY etc.
- ✓ About Aadhaar seeding with bank accounts, accounts open under PMJDY scheme etc.

Department of financial services (DFS) is taking care and monitoring the following indicators –

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation Check
1	Total disbursement of Mudra loan (in crore rupees) per 1 lakh population	0.83%	Monthly	Automatic generation from the Ministry website	Department of Financial Services (DFS)	No
2	Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY): number of enrolments per 1 lakh population	0.83%	Monthly	Automatic generation from the Ministry website	Department of Financial Services (DFS)	No
3	Pradhan Mantri Suraksha Bima Yojana (PMSBY): number of enrolments per 1 lakh population	0.83%	Monthly	Automatic generation from the Ministry website	Department of Financial Services (DFS)	No
4	Atal Pension Yojana (APY): number of beneficiaries per 1 lakh population	0.83%	Monthly	Automatic generation from the Ministry website	Department of Financial Services (DFS)	No
5	Percentage of	0.83%	Monthly	Automatic	Department	No

	accounts seeded with Aadhaar to total bank accounts			generation from the Ministry website	of Financial Services (DFS)	
6	Number of accounts opened under Pradhan Mantri Jan Dhan Yojana	0.83%	Monthly	Automatic generation from the Ministry website	Department of Financial Services (DFS)	No

(5b) Skill Development (5%) – Skill development is most necessary quality for everyone in the present time of competition arena. If we have good personality and skills, we can achieve any post in present time of competition. Government launched many schemes to improve the skills of the citizens which help us to secure a job for own needs and ambition. Under the TADP programme, Skill Development having 5% weightage of overall with 5 indicators (10 data points).

The Indicators broadly covers-

- ✓ About certified youth short or long term training scheme, certified youth employed, marginalized youth certified trained under training program etc.
- ✓ About no. of apprenticeships completing to no. of trainees registered on portal, no. of different category of certified trained person etc.

Ministry of social justice and empowerment, Ministry of minority affairs and other ministries is taking care and monitoring the following indicators –

No.	Indicators	Weightage	Periodicity	Data entry by	Source of Data	Validation Check
1	Percentage of youth certified in short term or long term training schemes to no. of youth in district in age group 15-29	1.25%	Monthly	Automatic generation from the Ministry website	NCVTMIS (PMKVY Dashboard); PMKVY (MSDE), DDUGKY (MoRD), ITI (DGT & NCVT), Polytechnics (MHRD)	Yes
2	Percentage of certified youth employed to no. of youth trained under short term or long term training	0.75%	Monthly			Yes
3	Number of apprenticeships completing to total number of trainees registered on the portal	1.25%	Monthly	Automatic generation from the Ministry website	MSDE & MHRD; NAPS – DGT & NVCT NATS – MHRD	Yes

4	No. of people certified under Recognition of Prior Learning to non-formally skilled workforce	0.50%	Monthly	Automatic generation from the Ministry website	PMKVY (MSDE), Non-formally trained workforce (Estimated through NSSO unit level data)	Yes
5.1	Percentage certified trained: women	0.50% 0.75%	Monthly	Automatic generation from the Ministry website	NCVTMIS (PMKVY Dashboard): PMKVY (MSDE), DDUGKY (MoRD), ITI (DGT & NCVT), Polytechnics (MHRD). Minorities (Ministry of Minorities), Women (WCD), SC/ST/OBC (MoSJE)	Yes
5.2	Percentage certified trained: SC		Monthly		Yes	
5.3	Percentage certified trained: ST		Monthly		Yes	
5.4	Percentage certified trained: OBC		Monthly		Yes	
5.5	Percentage certified trained: minorities		Monthly		Yes	
5.6	Percentage certified trained: differently abled		Monthly		Yes	

3. Review of Literature-

In this section, we are reviewing of some literature related to Aspirational districts, Bihar economy and convergence, poverty and spatial dependence.

3.1. Regional Income Convergence in India and Spatial dependence –

This paper analyses the convergence of India's economic growth in per capita income of 28 states for the time period of 1981-2010 and used spatial panel data model. It's also reveals local and global spatial dependence in growth of per capita income of states. It also suggested that a state's initial income depend upon neighbour behaviour. That implies that an initially poor state may grow faster if its neighbours are rich or growing fast. It has implications for growth policy-making in India.

3.2. Spatial dependence and economic growth: Evidence from a panel of countries-

This paper uses spatial econometrics model to estimate a growth model that includes cross country interdependence, in which a country's economic growth depends on the growth rate of its neighbours. Based on the data set of 98 countries over 3 decades (1965-1995), this paper concluded spatial dependence across countries are quite relevant. Any of country's economic growth depends on the neighbour's economic condition and also depends upon the geographical location. Its results indicate that spatial interrelation cannot be ignored in the analysis for economic growth of any country.

3.3. Development patterns in India: Spatial convergence or divergence? –

This paper is all about regional convergence among nations. It uses two measures beta and sigma convergence to analyze for checking poor nations catch up with developed nations. This paper provides recent debate on convergence, various explanations for understanding and measuring regional convergence, role of geographical location for spatial convergence/divergence, trends of regional inequality in India during 1961-2011. It focuses on prosperous regions like Punjab, Gujarat, Maharashtra those are rich in agricultural and industrial field and also focuses on lagging regions like Madhya Pradesh and Bihar.

3.4. Spatial convergence and growth in Indian agriculture: 1967-2010 –

This paper is all about spatial convergence and growth in Indian agriculture. This study finds strong evidence in favour of beta convergence, not in the sigma convergence. Spatial econometric models used in this study in identifying the impact of spatial neighbours on the growth of states and results are also showing the spatial dependence among states. And results are also indicating the growth of Indian agriculture depends upon the infrastructure like roads, electricity, water resources etc.

3.5. Regional disparities in per capita income in India: convergence or divergence? –

This paper examines the latest evidence on regional disparities in per capita income (GSDP per capita) in India over the 1st decade of 21st century (1991-2000 to 2010-11) by estimating cross-section model for unconditional and conditional beta (β) convergence and sigma (σ) convergence 32 regions (28 states and 4 union territories). There is no evidence of unconditional convergence, but weak evidence of conditional convergence controlling for population growth, male literacy, credit growth, agriculture's share in state GDP and state expenditure as a share of state GDP. Sigma divergence has increased continuously, except among the poor states.

3.6. Agricultural transformation in Aspirational Districts in India: Comparative Analysis of Districts in Bihar –

This paper analyses the key challenges and opportunities of agricultural development in the aspirational as well as non-aspirational underdeveloped districts of Bihar with rich districts or frontier districts and suggests some appropriate measures for accelerated and balanced agricultural development in Bihar. For overall economic development of aspirational and non-aspirational underdeveloped districts would require district-specific, sector-specific, and enterprise-specific interventions with technological innovations, land leasing reform, marketing reform and basic infrastructure. This will not only help to bridge the development gaps between aspirational as well as non-aspirational underdeveloped and rich districts, but also result in accelerated agricultural growth and rural transformation in Bihar.

3.7. Under the poor economic performance of Bihar and Uttar Pradesh, India: a macro perspective–

This paper analyses that the main causes of the poor economic growth of Bihar and India despite being rich in the area of natural resources. The process of economic marginalization has been reinforced by the federal central government's policy of 'freight equalization', which nullified the comparative advantage of Bihar and UP in natural resources by subsidizing railway freights of industrial inputs like coal, iron ore, steel, cement and other bulk resources. This also combined with relatively low financial support from central government over the past years, has undermined these states capacity to invest in health, education, basic infrastructure, and agriculture and in others areas and resulted in low human development and low economy of these states. The poor economic performance of UP and Bihar may be attributed to low human capital, weak institutions and poor infrastructure coupled with political instability and social conflict rooted in sectarian politics based on caste, class and ethnic division.

3.8. Chronic poverty in India: Overview study –

This paper examines the extent and nature of chronic poverty within the spatial poverty traps or remote rural areas. It also estimates of multidimensional indicators of poverty that reflect human and gender development and empowerment as also infant mortality estimates and female literacy rate. Poverty is just not a one factor that include income and calorie intake, it is multiplicity of factors that includes nutrition, agriculture, health, literacy and education and pure drinking water, sanitation and others infrastructural facilities. It also briefly described policy interventions in the context of poverty reduction as also attempts by communities to demand accountability and transparency in government spending in the name of the poor.

4. Methodology –

4.1. Unconditional convergence without Spatial model –

The Unconditional convergence equation without any spatial effects is states as follows:

$$Y_i = \alpha + \beta X_i + u_i$$

In the above equation, GDP per capita growth ' Y_i ' is the dependent variable and Initial GDP per capita level ' X_i ' is the independent variable. α & β are the parameters to be estimated, and u_i is the error term.

4.2. Unconditional convergence with Spatial model –

We will use two kinds of spatial models for unconditional convergence.

a) SAR (Spatial Autoregressive Model or Spatial Lag model) –

This model takes into consideration the spatial dependence among the dependent variables. This model will be used to test for convergence when the growth rate of any region not only depends on its own initial per capita income but also on the growth rate of its neighbouring regions.

$$Y_i = \alpha_i + \beta \ln(Y_0) + \rho W Y_i + u_i$$

Where $Y_i = \ln(Y_t/Y_0)$ is growth rate of per capita income over the time ' t ', Y_0 is initial GDP per capita in district ' i ', Y_t is GDP per capita at time ' t ', W is spatial weight matrix, $W Y_i$ depicts the spatial dependence among dependent variables, the estimated parameter ' ρ ' gives the strength of this spatial dependence.

b) SEM (Spatial Error Model) –

This model takes into consideration the spatial dependence among the error terms. This type of spatial dependence may arise because of omitted variables in the models.

$$Y_i = \alpha_i + \beta \ln(Y_0) + \lambda W u + e_i$$

Where $u_i = \lambda W u + e_i$, $W u$ depicts the spatial dependence in error terms across the neighbouring regions, the estimated parameter ' λ ' gives the strength of this error term spatial dependence.

5. Data and sources –

We have the data of GDP of districts of Bihar from time period 2004-05 to 2011-12. We collected the data from Bihar statistical book 2015-16, Bihar economic survey 2019-20 and Bihar government official site.

SL. NO.	DISTRICT'S	LATITUDE	LONGITUDE	EGR	AAGR	X
1	Patna	25.5941	85.13757	7.704125	8.196432	10.5126
2	Nalanda	25.12829	85.45023	9.139234	9.611955	8.798606
3	Bhojpur	25.46615	84.52222	8.595777	9.113936	8.828494
4	Buxar	25.56471	83.97745	8.14558	8.608394	8.761393
5	Rohtas	24.63036	83.92031	7.114496	7.5354	9.042277
6	Kaimur(Bhabua)	25.04262	83.60558	6.665029	7.258486	8.784162
7	Gaya	24.78001	84.98183	7.623818	8.044973	8.850374
8	Jehanabad	25.21393	84.98956	8.94599	9.594939	8.695841
9	Arwal	25.23911	84.66957	7.713152	8.080336	8.578853
10	Nawada	24.88	85.53	8.255397	8.74186	8.587465
11	Aurangabad	24.75	84.37	8.144156	8.816284	8.73665
12	Saran	26.03862	84.68975	7.647177	7.975561	8.734721
13	Siwan	26.21962	84.35666	8.118384	9.470024	8.708309
14	Gopalganj	26.4667	84.4333	8.893816	9.551079	8.780787
15	Muzaffarpur	26.12147	85.36875	8.010984	8.583542	9.081484
16	East Champaran	26.60981	84.85679	7.373118	8.9718	8.765146
17	West Champaran	27.15431	84.35421	3.740613	4.212639	8.945593
18	Sitamarhi	26.5873	85.50118	7.953382	8.585661	8.606302
19	Sheohar	26.51459	85.29423	6.719173	7.533465	8.396381
20	Vaishali	26.00403	85.08201	7.958813	8.712494	8.875567
21	Darbhanga	26.15297	85.90141	6.996229	7.438552	8.809714
22	Madhubani	26.34788	86.07186	3.937134	6.132084	8.855806
23	Samastipur	25.86297	85.78103	6.97637	7.907235	8.795431
24	Begusarai	25.41668	86.12938	6.399258	7.437366	9.326967
25	Munger	25.37571	86.47437	8.879093	9.363619	9.379577
26	Sheikhpura	25.14169	85.86289	8.003362	8.48913	8.618305
27	Lakhisarai	25.1689	86.09299	8.325881	8.789207	8.895493
28	Jamui	24.92	86.22	7.013677	7.361733	8.735847
29	Khagaria	25.50666	86.47253	5.931988	6.15929	8.936167
30	Bhagalpur	25.25339	86.98906	7.790236	8.142177	9.214532
31	Banka	24.88548	86.92073	5.890564	6.414469	8.722091
32	Saharsa	25.8835	86.60062	6.66593	7.087291	8.94233
33	Supaul	27.28264	84.5995	4.150175	4.525754	8.756368
34	Madhepura	25.9247	86.79453	4.016569	4.397201	8.779404
35	Purnea	25.7711	87.48219	5.357008	5.59662	8.845201
36	Kishanganj	26.30779	87.77634	5.051434	5.385199	8.849514
37	Araria	26.13114	87.44553	5.779342	6.067214	8.675222
38	Katihar	25.53351	87.58375	5.227338	5.53408	8.964696

Data-1

6. Codes and Result Discussion-

We used the Stata software for the checking the convergence of GDP per capita data. In our data set(Data-1), we have the data of districts of Bihar with latitude and longitude, their GDP per capita data of time period 2004-05 to 2011-12.The dependent variables are EGR (exponential growth rate) which is equal to $\ln\left(\frac{\text{final year GDP per capita}}{\text{initial year GDP per capita}}\right)/7$ & AAGR (average annual growth rate) which is equal to

$\sum_{i=2004-05}^{2011-12} \left(\frac{G_{i+1}-G_i}{G_i} \right) \times 100$, where G_i is the GDP per capita for i^{th} year and G_{i+1} is the GDP per capita for $i + 1^{\text{th}}$ year and independent variable is X which is the scale down value of initial GDP per capita equal to $\ln(\text{initial year GDP per capita})$.First of all, we will check convergence between EGR (dependent variable) and X (independent variable) and then, check convergence between AAGR (dependent variable) and X (independent variable). After that, we will compare the both results.

a) For the variables, exponential growth rate(EGR) and x-

```
>> use "C:\spatial model\bihar gdp extra.dta"
>> global ylist egr
>> global xlist x
>> global xcoord latitude
>> global ycoord longitude
>> global band 3
>> describe $ylist $xlist
>> summarize $ylist $xlist
    ## Spatial weight matrix
>> spatwmat, name(W) xcoord($xcoord) ycoord($ycoord) band(0 $band) standardize eigenval(E)
    ## OLS Regression
>> reg $ylist $xlist
    ## Spatial diagnostics
>> spatdiag, weights(W)
    ## Spatial error model
>> spatreg $ylist $xlist,weights(W) eigenval(E) model(error)
    ## Spatial lag model
>> spatreg $ylist $xlist,weights(W) eigenval(E) model(lag)
    ## Scatter plot
>> twoway(scatter egr x) (lfit egr x)
```

✓ Statistics of variables -

Variables	Obs.	Mean	Std. Dev.	Min	Max
egr	38	7.022469	1.496411	3.740613	9.139235
x	38	8.872991	.3350435	8.39638	10.5126

Table-1

The statistics of variables i.e. egr (dependent variable) and x (independent variable) are shown in Table 1.

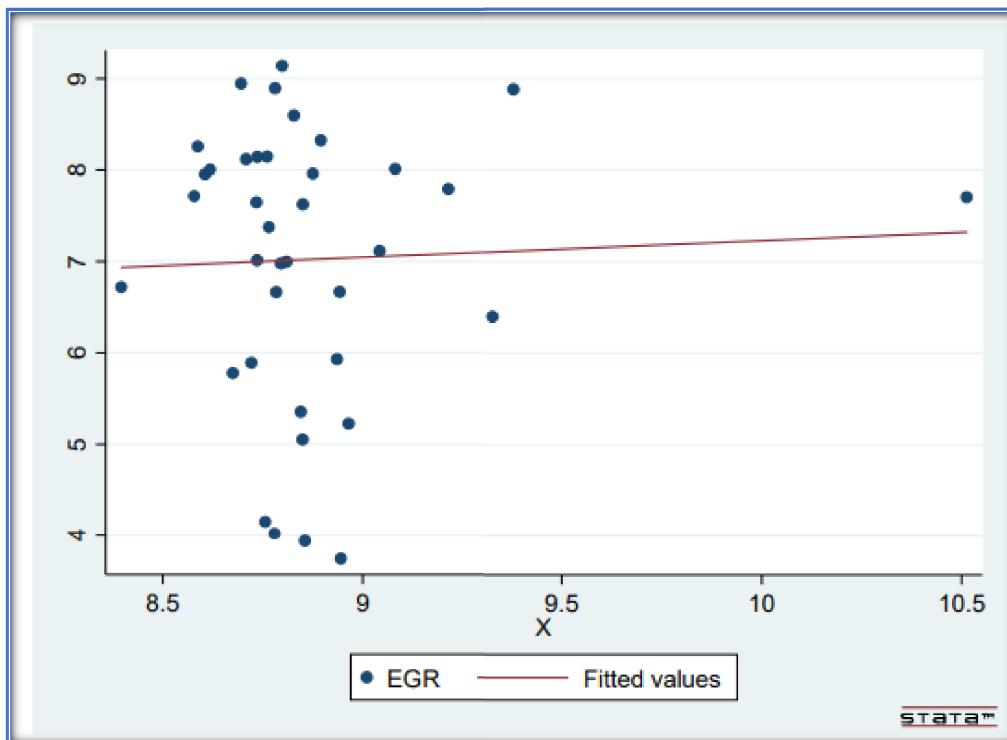
✓ OLS Regression-

egr	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
x	.1842104	.7437532	0.25	0.806	-1.324191	1.692612
_cons	5.387971	6.603895	0.82	0.420	-8.005349	18.78129

Table - 2

The results of OLS model for unconditional convergence are shown in Table 2. The coefficient of initial level of GDP per capita which is our independent variable independent is positive (which is the case of divergence) but P value for the independent variable is highly insignificant. Thus, we cannot conclude anything about convergence or divergence.

✓ Scatter plot of variables –



Graph-1

The slope of scatter plot is positive which implies that it is the case of divergence.

✓ Weight matrix: Diagnostics –

Test	Statistic	df	P-value
Spatial error :			
Moran's I	4.859	1	0.000
Lagrange multiplier	6.284	1	0.012
Robust Lagrange multiplier	0.180	1	0.671
Spatial lag:			
Lagrange multiplier	6.258	1	0.012
Robust Lagrange multiplier	0.154	1	0.694

Table – 3

The result of Weight matrix Diagnostics – Moran's I statistics are shown in Table 3. The value of Moran's I is statistically significant implies that there is spatial dependence among dependent and error terms. Then, we will proceed for applying spatial econometric model.

✓ **Spatial error model-**

egr	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
egr						
x	.2161575	.6517228	0.33	0.740	-1.061196	1.493511
_cons	4.710123	5.855153	0.80	0.421	-6.765766	16.18601
lambda	.7535162	.228632	3.30	0.001	.3054057	1.201627

Table -4

Acceptable range of lambda: -5.399 < lambda < 1.000

The result of spatial error model is shown in Table-4. The coefficient of lambda is positive and value of P = 0.001 for lambda which is highly significant. It shows that there is spatial dependence among the error terms. P value for the coefficient of independent variable is insignificant. Thus, we cannot conclude anything about convergence or divergence.

✓ **Spatial lag model -**

egr	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
egr						
x	.2121598	.666335	0.32	0.750	-1.093833	1.518152
_cons	-.2503748	6.158685	-0.04	0.968	-12.32117	11.82043
rho	.7534978	.2287613	3.29	0.001	.3051339	1.201862

Table -5

Acceptable range of rho: -5.399 < rho < 1.000

The result of spatial lag model is shown in Table-5. The coefficient of rho is positive and value of P = 0.001 for rho which is highly significant. It shows there is spatial dependence among the dependent variable (which is exponential growth rate of GDP per capita). P value for the coefficient of independent variable is insignificant. Thus, we cannot conclude anything about convergence or divergence.

b) **For the variables, Average annual growth rate(AAGR) and x-**

```
>> use "C:\spatial model\bihar gdp extra.dta"
>> global ylist aagr
>> global xlist x
>> global xcoord latitude
>> global ycoord longitude
>> global band 3
>> describe $ylist $xlist
>> summarize $ylist $xlist
```

```

## Spatial weight matrix
>> spatwmat, name(W) xcoord($xcoord) ycoord($ycoord) band(0 $band) standardize eigenval(E)
    ## OLS Regression
>> reg $ylist $xlist
    ## Spatial diagnostics
>> spatdiag, weights(W)
    ## Spatial error model
>> spatreg $ylist $xlist,weights(W) eigenval(E) model(error)
    ## Spatial lag model
>> spatreg $ylist $xlist,weights(W) eigenval(E) model(lag)
    ## Scatter plot
>> twoway(scatter aagr x) (lfit aagr x)

```

✓ **Statistics of variables -**

Variables	Obs.	Mean	Std. Dev.	Min	Max
aagr	38	7.616513	1.524159	4.212639	9.611955
x	38	8.872991	.3350435	8.39638	10.5126

Table-6

The statistics of variables i.e. aagr (dependent variable) and x (independent variable) are shown in Table 6.

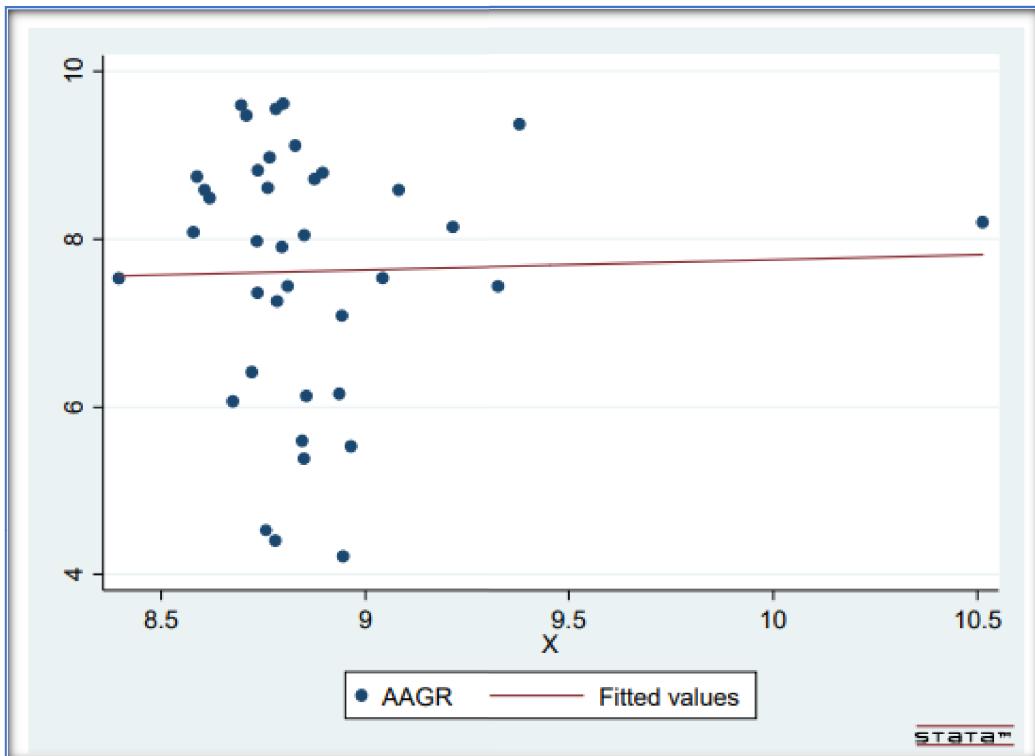
✓ **OLS Regression-**

aagr	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
x	.1193189	.7579287	0.16	0.876	-1.417832	-1.417832
_cons	6.557797	6.729762	0.97	0.336	-7.090792	20.20639

Table-7

The results of OLS model for unconditional convergence are shown in Table 7. The coefficient of initial level of GDP per capita which is our independent variable independent is positive (which is the case of divergence) but P value for the independent variable is highly insignificant. Thus, we cannot conclude anything about convergence or divergence.

✓ **Scatter plot of variables**



Graph-2

The slope of scatter plot (Graph-2) is positive which implies that it is the case of divergence.

✓ **Weight matrix: Diagnostics -**

Test	Statistic	df	P-value
Spatial error :			
Moran's I	5.397	1	0.000
Lagrange multiplier	8.100	1	0.004
Robust Lagrange multiplier	0.687	1	0.407
Spatial lag:			
Lagrange multiplier	8.063	1	0.005
Robust Lagrange multiplier	0.650	1	0.420

Table-8

The result of Weight matrix Diagnostics – Moran's I statistics are shown in Table 8. The value of Moran's I is statistically significant implies that there is spatial dependence among dependent and error terms. Then, we will proceed for applying spatial econometric model.

✓ **Spatial error model-**

aagr	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
aagr						
x	.1884728	.6531458	0.29	0.773	-1.091669	1.468615
_cons	5.438951	5.902313	0.92	0.357	-6.12937	17.00727
lambda	.7826692	.2040579	3.84	0.000	.3827231	1.182615

Table-9

Acceptable range of lambda: -5.399 < lambda < 1.000

The result of spatial error model is shown in Table-9. The coefficient of lambda is positive and value of P = 0.000 for lambda which is highly significant. It shows that there is spatial dependence among the error terms. P value for the coefficient of independent variable is highly insignificant. Thus, we cannot conclude anything about convergence or divergence.

✓ **Spatial lag model -**

aagr	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
aagr					
x	.1679908	.6685059	0.25	0.802	-1.142257 1.478238
_cons	.056494	6.173203	0.01	0.993	-12.04276 12.15575
rho	.7822639	.204477	3.83	0.000	.3814963 1.183031

Table-10

Acceptable range of rho: -5.399 < rho < 1.000

The result of spatial lag model is shown in Table-10. The coefficient of rho is positive and value of P = 0.000 for rho which is highly significant. It shows there is spatial dependence among the dependent variable (which is average annual growth rate of GDP per capita). P value for the coefficient of independent variable is insignificant. Thus, we cannot conclude anything about convergence or divergence.

c) Comparison of results of EGR & AAGR-

When we will compare the both results which are almost same type i.e. the coefficient of independent variable is positive and P value of independent variable is highly insignificant. So, the required result is, we cannot conclude anything about convergence or divergence.

d) When we remove 8 outlier districts from data-

The outlier districts are following-

- | | |
|--------------|---------------|
| 1. Araria | 5. Supaul |
| 2. Madhubani | 6. Purnea |
| 3. Sheohar | 7. Kishanganj |
| 4. Arwal | 8. Madhepura |

```
>> use "C:\spatial model\edit data.dta"
>> global ylist egr
>> global xlist x
>> global xcoord latitude
>> global ycoord longitude
>> global band 3
>> describe $ylist $xlist
>> summarize $ylist $xlist
## Spatial weight matrix
>> spatwmat, name(W) xcoord($xcoord) ycoord($ycoord) band(0 $band) standardize eigenval(E)
## OLS Regression
>> reg $ylist $xlist
## Scatter plot
```

```
>> twoway(scatter egr x) (lfit egr x)
```

✓ Statistics of variable -

Variables	Obs.	Mean	Std. Dev.	Min	Max
egr	30	7.470994	1.19249	3.740613	9.139235
x	30	8.914564	.3583866	8.587465	10.5126

Table-11

The statistics value of the variables egr (dependent variable) and x (independent variable) is shown below in Table 11.

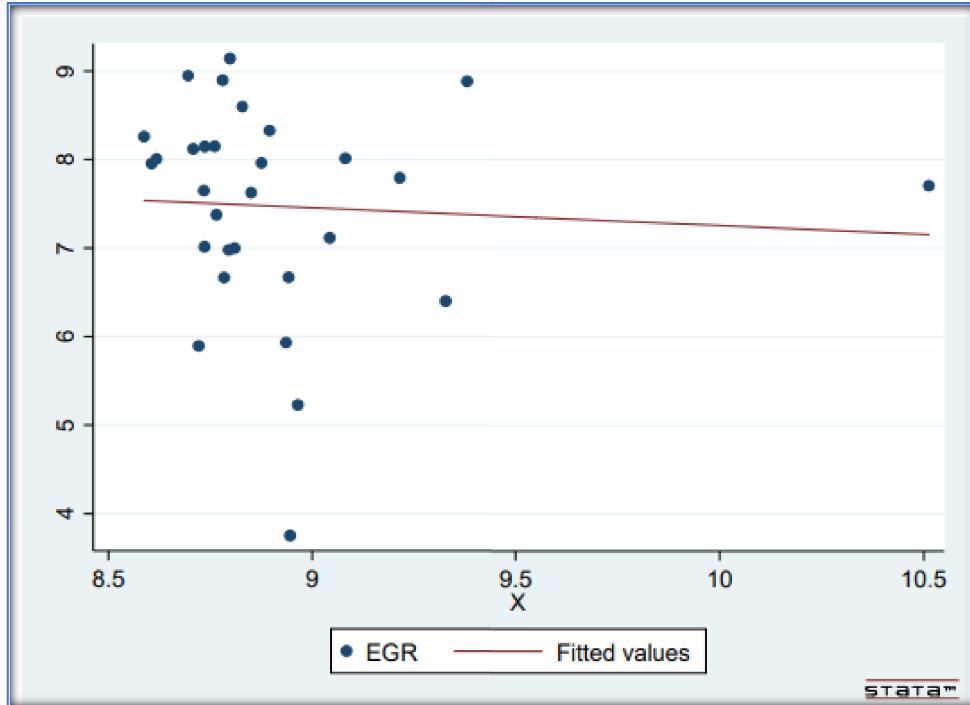
✓ OLS Regression -

egr	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
x	-.1995855	.6276844	-0.32	0.753	-1.485339	1.086168
_cons	9.250212	5.599902	1.65	0.110	-2.220669	20.72109

Table-12

The results of OLS model for unconditional convergence are shown in Table 12. The coefficient of initial level of GDP per capita which is our independent variable independent is positive (which is the case of divergence) but P value for the independent variable is highly insignificant. Thus, we cannot conclude anything about convergence or divergence.

✓ Scatter plot of variables-



Graph-3

The slope of scatter plot (Graph-3) is negative which implies that it is the case of convergence.

✓ Weight matrix : Diagnostics-

Test	Statistic	df	P-value
Spatial error :	0.337	1	0.736
	0.158	1	0.691
	1.228	1	0.268
Spatial lag:	0.142	1	0.706
	1.212	1	0.271

Table -13

The result of Weight matrix Diagnostics – Moran's I statistics are shown in Table-13. The value of Moran's I is statistically significant implies that there is spatial dependence among dependent and error terms But P-value for Moran's I is highly insignificant. So, we will not proceed for applying spatial econometric model.

7. Conclusion –

In this study, we conclude that what is the Aspirational District programme and how this programme helps the laggard districts to catch up with the rich or frontier districts within own state. We did also the mapping of different data on the Bihar's map. According to our study, we cannot conclude anything about convergence or divergence. So, Poor districts in Bihar are not really catching up the rich /frontier districts. Poor districts of Bihar and also getting poor & rich districts also have downward progress. So, under the TADP programme, Government have to provide support for Bihar citizens and Citizens of Bihar also have to take the advantage of government scheme. The literacy rate of Bihar is the lowest among all states of India. So, they have to concentrate and focus on mainly education and also take care of our health and improve the skills and financial knowledge. If the citizens of Bihar will do hard work in effective manner and take the advantage of all the schemes, then Bihar will become the rich and developed state in upcoming years.

References

- [1] Lolayekar, A.P., & Mukhopadhyay, P., (2016). Regional Income Convergence in India and spatial dependence.
- [2] Kalra, R., & Thakur, S. (2015). Development patterns in India: Spatial convergence or divergence?. *GeoJournal*, 80(1), 15–31.
- [3] Rowan Cherodian & A. P. Thirlwall, (2015). Regional disparities in per capita income in India: convergence or divergence?. *Journal of Post Keynesian Economics*, 37:3, 384-407, DOI: 10.1080/01603477.2015.1000109
- [4] Ramírez, M. T., & Loboguerrero, A. M. (2002). Spatial dependence and economic growth: Evidence from a panel of countries. *Borradores de Economía Working Paper*, (206).
- [5] Chaterjee, T. (2014). Spatial convergence and growth in Indian agriculture: 1967–2010.
- [6] Rasul, G. & Sharma, E. (2014). Understanding the poor economic performance of Bihar and Uttar Pradesh, India: a macro-perspective, *Regional Studies, Regional Science*, 1:1, 221-239, DOI: 10.1080/21681376.2014.943804

- [7] Haque, T; and Joshi, P. K.. (2018). Agricultural transformation in Aspirational districts of India: Comparative analysis of districts in Bihar. Economic and Political Weekly 53(51), 29 Dec, 2018. <https://www.epw.in/journal/2018/51/review-rural-affairs/agricultural-transformation-aspirational.html>
- [8] Mehta, A. K. and Shah, A., (2001). Chronic Poverty in India: Overview Study. Chronic Poverty Research Centre Working Paper No. 7. <http://dx.doi.org/10.2139/ssrn.1754532>
- [9] NITI Aayog. (2018, April 1). Aspirational Districts. Retrieved February 15, 2020, from <http://championsofchange.gov.in/about>
- [10] Bihar Government. (2019). Bihar Economic Survey 2019-20. Retrieved February 15, 2020, from <http://finance.bih.nic.in/Reports/Economic-Survey-2020-EN>
- [11] Bihar Government. (2017, December 27). Bihar Statistical Hand book 2016. Retrieved February 15, 2020, from <http://dse.bih.nic.in/New-Publications/>
- [12] INDIA MAP. (2000). Retrieved from <https://gramener.com/indiamap/>

MAPPING OF DISTRICTWISE DATA ON BIHAR MAP

BY-VISHVAJEET KUMAR GOND



DATA SOURCES-

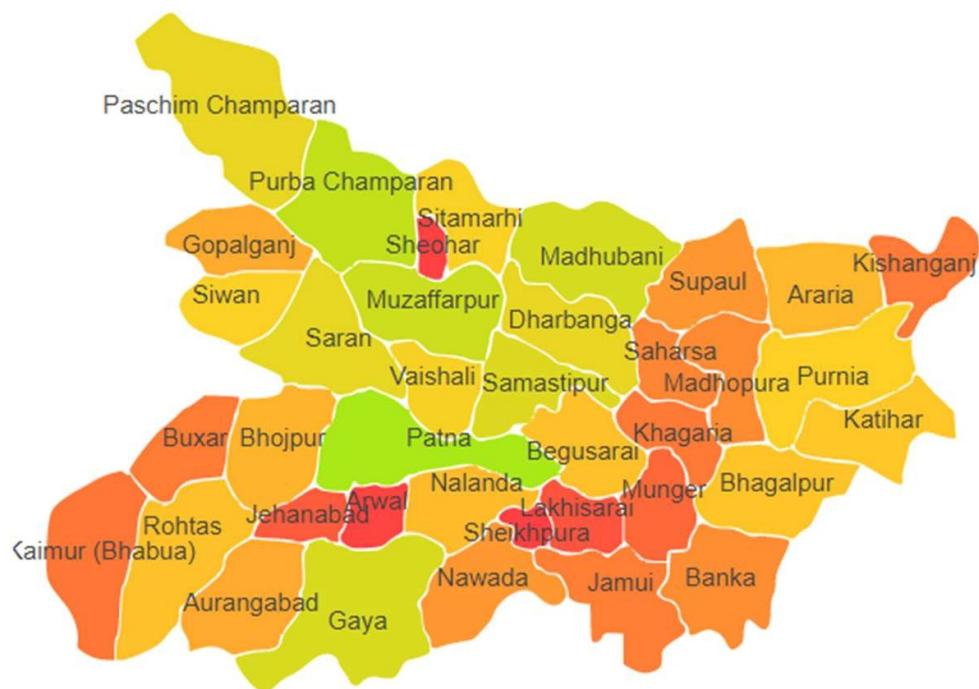
- BIHAR ECONOMIC SURVEY 2019-20
- BIHAR STATISTICAL HANDBOOK 2015-16

IMPORTANT POINTS-

- Red colour denotes low value.
- Yellow colour denotes middle value.
- Green colour denotes high value.

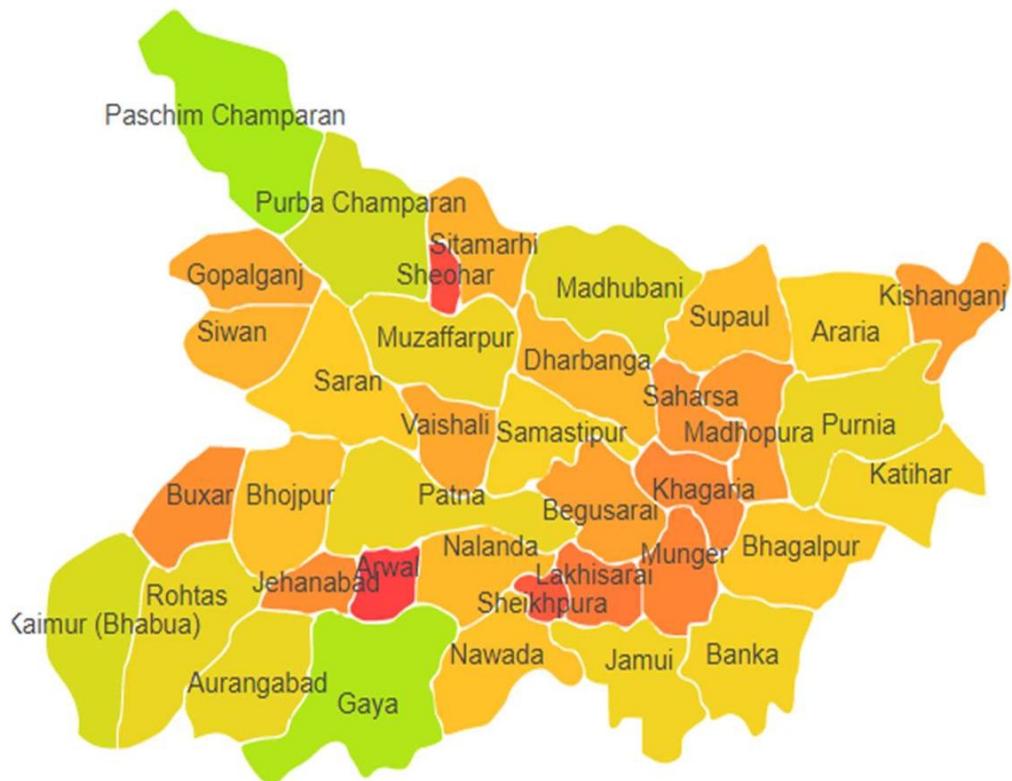


1. POPULATION OF BIHAR (IN 2011)



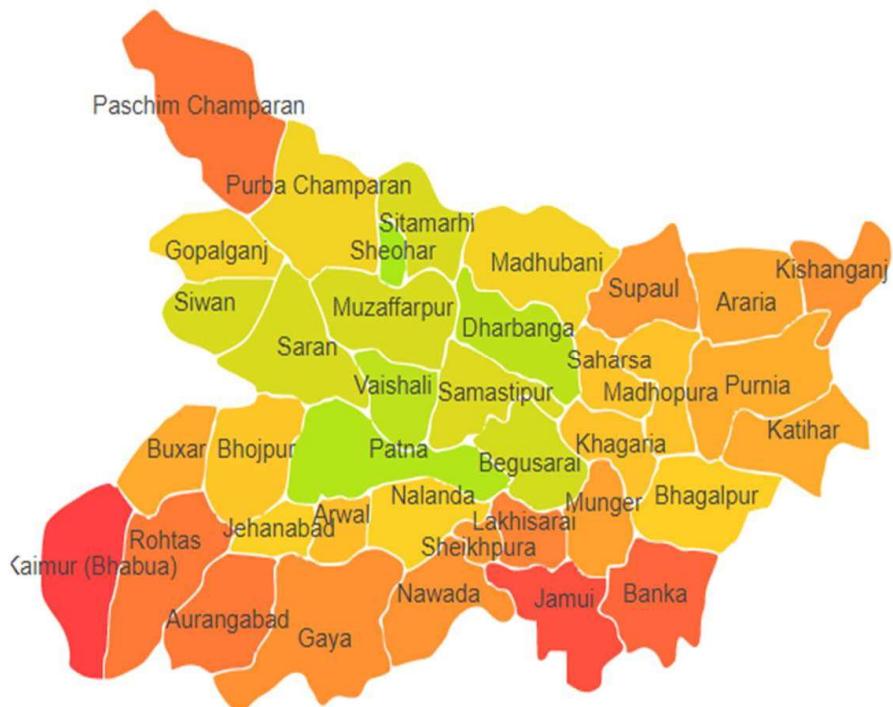
- Patna having high population in all districts of Bihar in 2011.
- Population of Patna in 2011 : **47.2 lakh**
- Population of overall Bihar in 2011 : **830 lakh**
- Explanations: As we know, Bihar is the one of the most populated state in India. With an average density of 1102, Bihar is the most densely populated state in India. Patna with a density of 1803 per sq. km is on the second place in the Bihar. Sheohar is on top of the districts according to population density of 1882 per sq. km. Patna geographical area is larger than Sheohar. So, Patna is the most populated districts in all districts of Bihar. And we can also say that Poverty is the one of the main cause for high population of Bihar. To increase own men power in agricultural activity for high production of crops, peoples are producing more children.

2. GEOGRAPHICAL AREA IN BIHAR



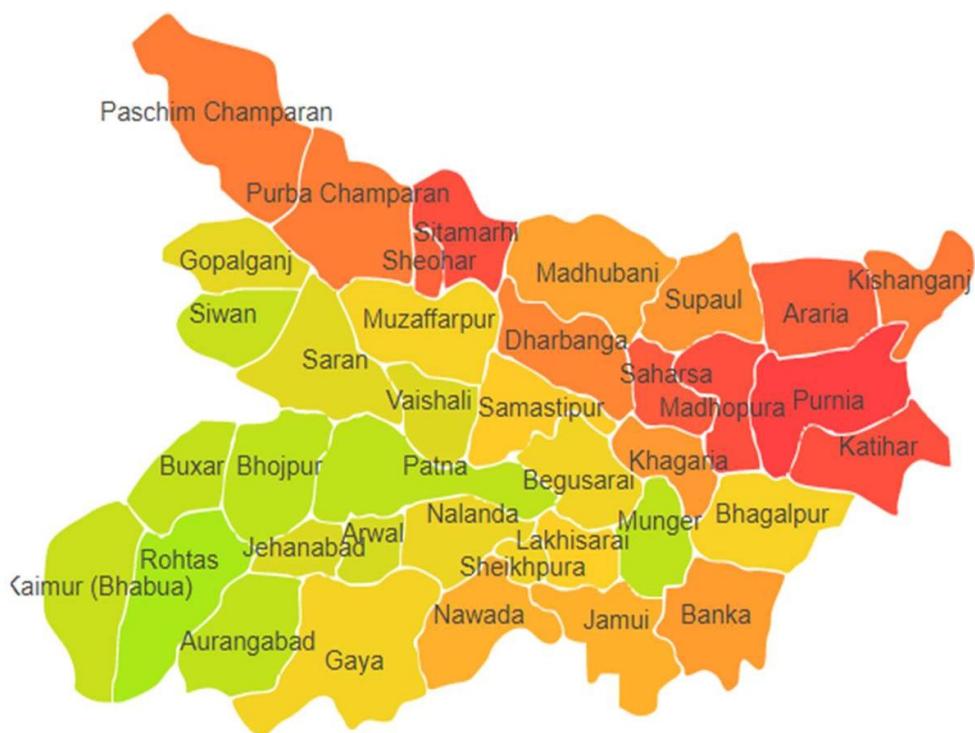
- Paschim Champaran (West Champaran) have large geographical area in all districts of Bihar.
- Geographical area of Paschim Champaran: **5228 sq. km**
- Explanations: Bihar is on 12th spot in the field of geographical area according to census 2011. Total geographical area of Bihar is **94163 sq. km**. Bihar is surrounded by Nepal in north side, West Bengal in south-east side, Uttar Pradesh in west side and Jharkhand in south side.

3. DENSITY IN BIHAR (IN 2011)



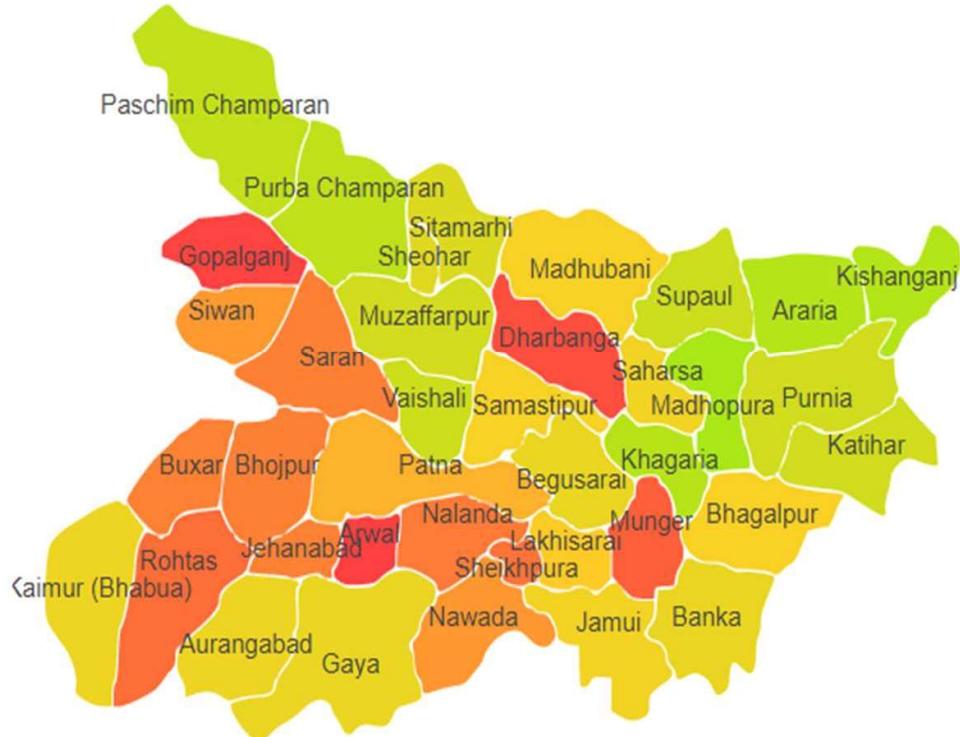
- Sheohar have high density in overall districts of Bihar in 2011.
- Population Density of Sheohar : **1882**
- Explanations: Bihar having an average increase of 211 more people inhabit per sq. km as compared to 2001, when density was 881. A sharp increase in density is a direct result of unabated population growth. It direct affects on infrastructure, natural resources, and quality of life of every individual. Density usually varies according to climatic condition, geo-physical characteristics and availability of resources. But, within any state it also depends upon urbanisation and migration. Bihar also having the advantage of Ganges. River helps nearby area by providing easy irrigation, fishing opportunities and making agricultural field more fertile. Due to ease of life, concentration of population increases.

4. LITERACY RATE IN BIHAR (IN 2011)



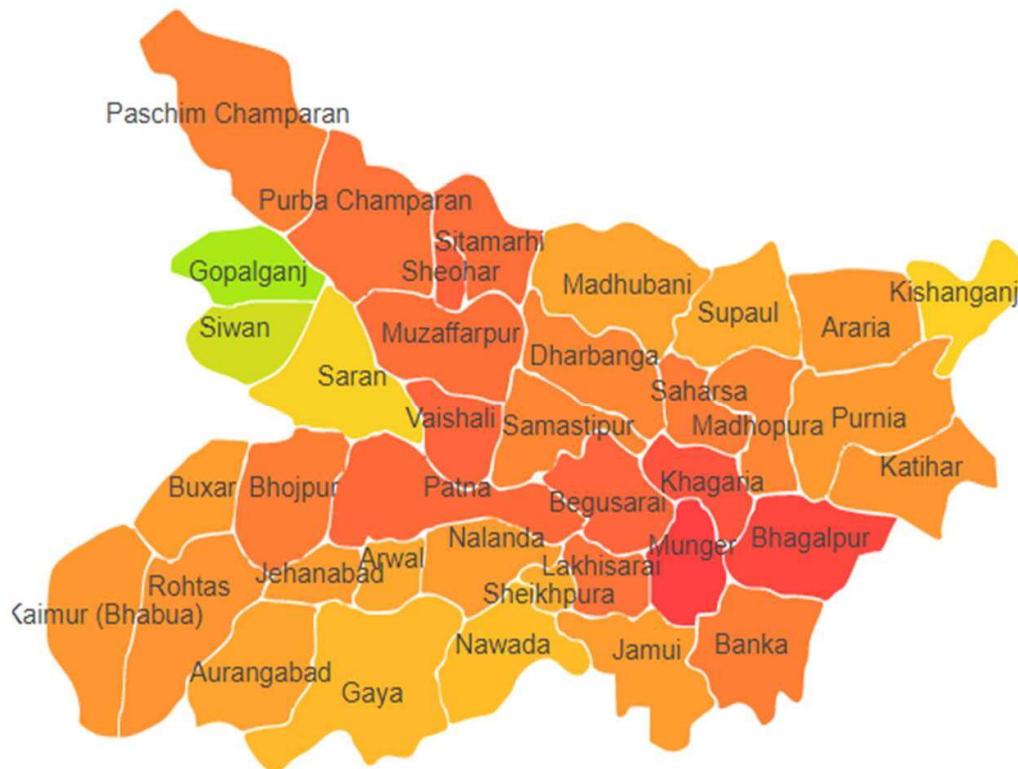
- **Rohtas** have high literacy rate in all districts of Bihar in 2011.
- Literacy rate of Rohtas: **73.37%**
- Literacy rate of Bihar: **54.0%**
- Explanations: Literacy rate of Bihar is lowest among all states of India. Why northern districts have low literacy as compared to southern and western side? Northern districts boundary is connected with Nepal which have low literacy rate and Nepal is also undeveloped country. In western and southern side of Bihar, neighbours are Varanasi (UP), and Jharkhand state respectively which have high literacy rate .Jharkhand having mining industries, Tata Company and many more industry. Varanasi is also so developed due to BHU college, IIT BHU, Kashi (tourist place) etc. So, according to the spatial model, neighbours behaviour matters. If the neighbours are developed, then it also impact positive on others.

5. % INCREASE IN LITERACY RATE IN BIHAR (2001-11)



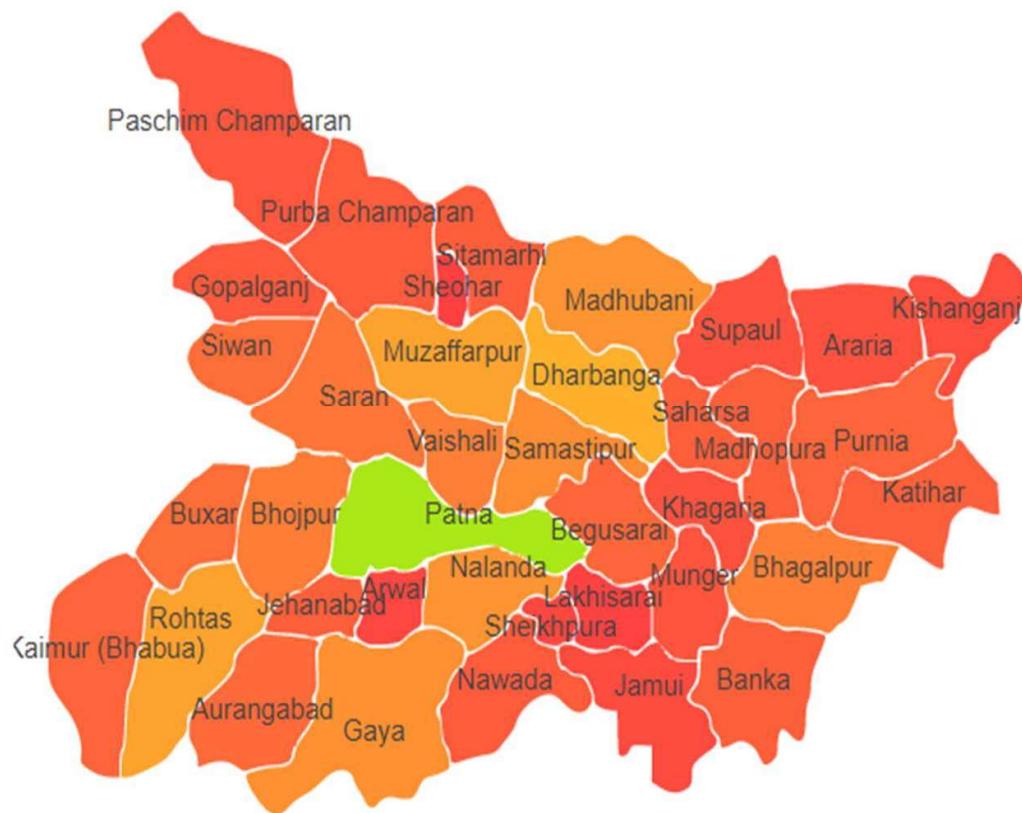
- **Madhepura** have highest % increase in the literacy rate in all districts of Bihar during 2001-11.
- % increase in literacy rate in Madhepura: **31.12%**
- Explanations: Bihar also had low literacy rate in 2001. Bihar literacy rate increased by 17% during 2001-11 which is highest increment in literacy rate in India. It may have many reasons but one of the causes is that the gap of literacy rate in Bihar was so high. So, increase in literacy rate is so high as compared to other ones. Others reasons for increase in high literacy rate:
 - Providing free education in primary level and mid-day meal which motivates poor children for education.
 - Government is spending a good part of GDP on the education and promoting everyone for education.
 - Govt. is providing free school dress and cycle to girls for promoting girls education in the society.

6. SEX RATIO IN BIHAR (IN 2011)



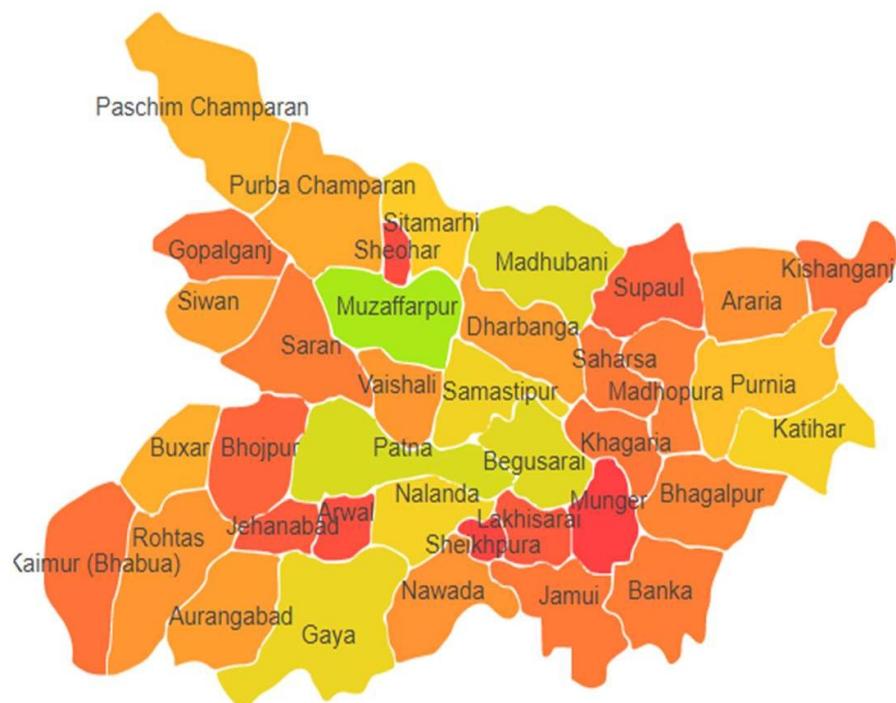
- Gopalganj have high sex ratio in all districts of Bihar in 2011.
- Sex ratio in Gopalganj: 1021
- Sex ratio is equal to the no. of female per 1000 male.
- Explanations: Bihar sex ratio is 918 according to census 2011 which is below than the national average of 940. Sex ratio depends on three factors- sex ratio at birth, differential mortality rates between sexes at different ages, and losses and gains through migration. Why the sex ratio is low in Bihar except Gopalganj?
 - According to old rituals, boys are superior to girls. It results into preference of the boys over girls.
 - Female infanticide and abortion which lead to low female population because of dowry at the time of marriage.
 - Increase the men power in the agricultural activity and others area.

7. NO. OF COLLEGES IN BIHAR (2018-19)



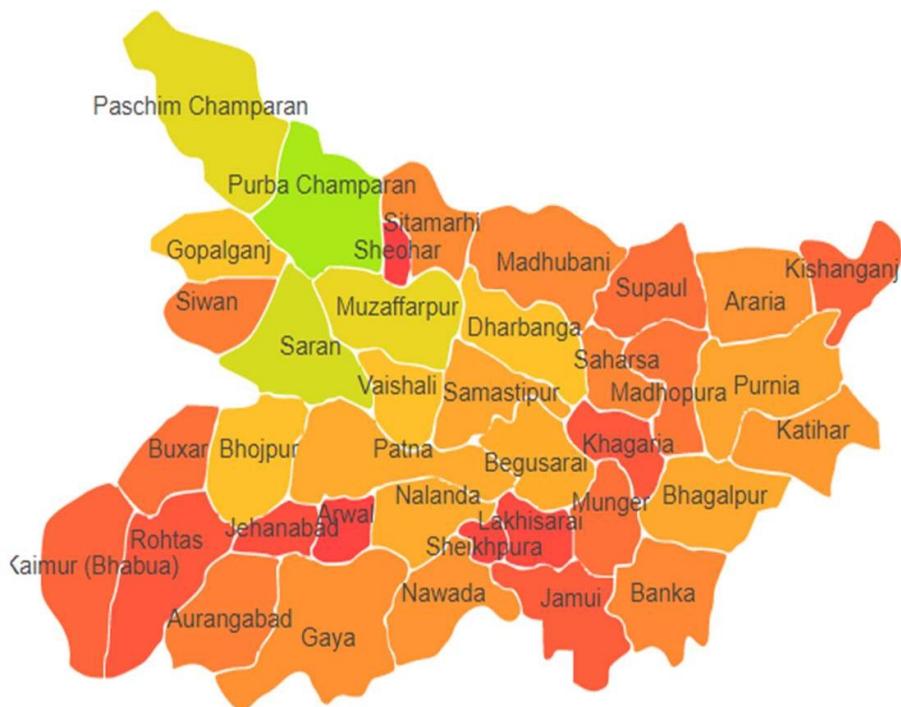
- **Patna** having high no. of colleges of different streams (like engineering, medical, arts, commerce etc.) in all districts of Bihar in 2018-19.
- Total no. of colleges in Patna: 129
- Explanations: Patna is the capital of Bihar. The economy of Patna is better than the all districts of Bihar. Patna is so developed than others because of that no. of colleges in Patna is the highest among all districts of Bihar. IIT and NIT are also present in Patna which is known for the one of the best engineering colleges in India. Every year many of the IAS & PCS selected from the Bihar which is showing positive effect for colleges.

8. TOTAL ENROLMENT IN PRIMARY LEVELS (2017-18)



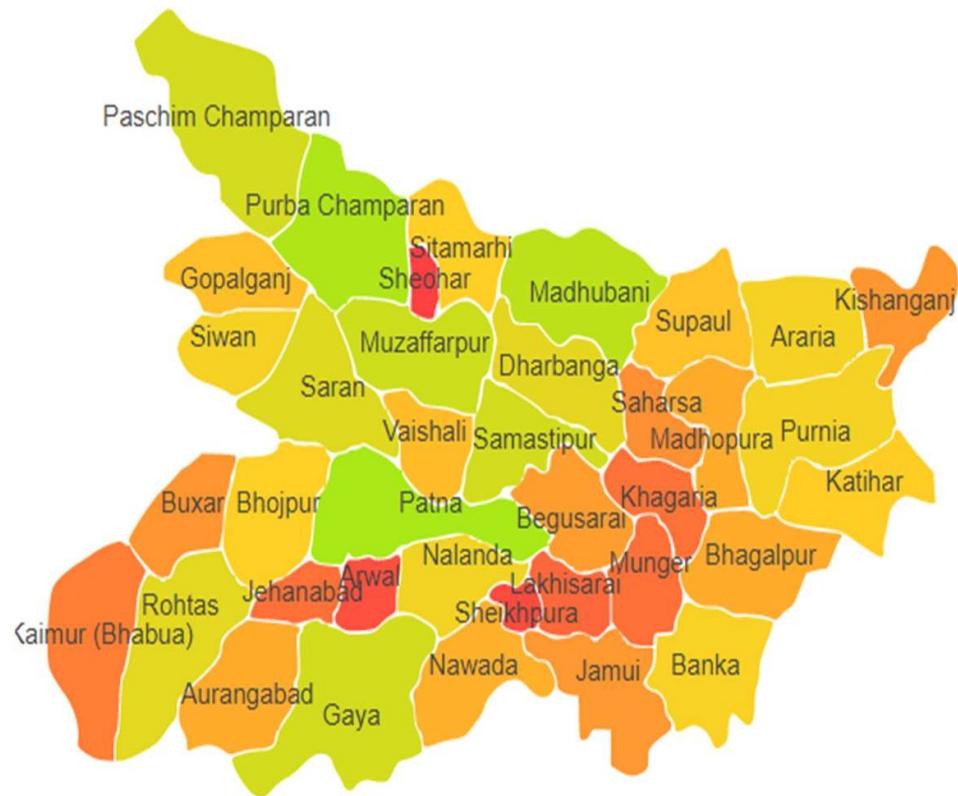
- Muzaffarpur have high no. of enrolment in primary level in all districts of Bihar in 2017-18.
- Total enrolment in primary levels in Muzaffarpur: **9.91 lakhs**
- Explanations: For any person, Education is started from the primary level. Central Government started the scheme of "Sb pde, Sb bde" which is so helpful for promoting education in poorer regions of India. Government is providing the free education, mid-day meal, free school dresses and free books etc. It results into the Poor people can send their children for education. In every state, no. of enrolment in primary levels increasing rapidly throughout the years.

9. TOTAL ENROLMENT IN UPPER PRIMARY LEVEL (2017-18)



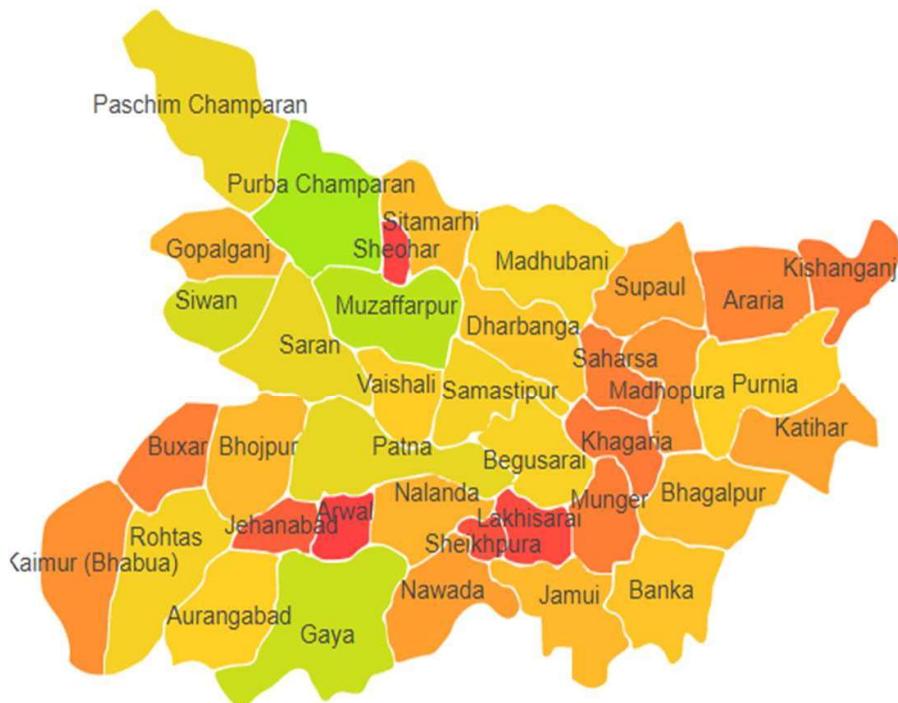
- Purba Champaran(East Champaran) having high no. of enrolment in upper primary level in all districts of Bihar in 2017-18.
- Total no. of enrolment in upper primary level in Purba Champaran (East Champaran): **7.64 lakhs**
- Explanations: In education, upper primary level comes after primary level. Central Government started the schemes like "Serv Sikhsa Abhiyan" & "Sb pde, Sb bde" which is so helpful for promoting education in poorer regions of India. Government is providing the free education, mid-day meal, free school dresses and free books etc. It results into the Poor people can send their children for education. In every state, no. of enrolment in upper primary levels increasing rapidly in upcoming years. In Bihar, East Champaran having highest no. of enrolment in upper primary levels.

10. TOTAL NO. OF PRIMARY SCHOOL IN BIHAR (2017-18)



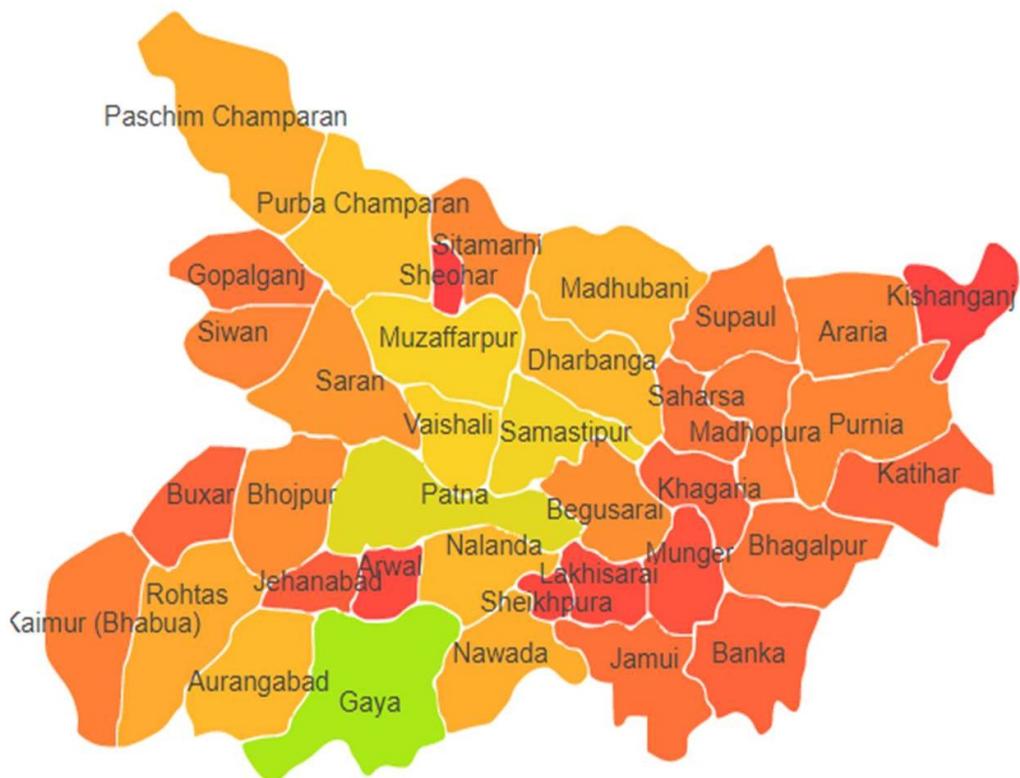
- **Patna** having high no. of primary schools in all districts of Bihar in 2017-18.
- Total no. of Primary schools in Patna: **2190**
- Explanations: Higher no. of Primary schools indicates the Government is providing full support for promoting the education in the district. In present time, Government is spending a lot of money for providing free education to those children who are not able to pay high fees of private schools. Poorer districts like Madhubani also have higher no. of primary schools. It also means poorer districts are also attracting towards education. With the help of education, poorer districts will catch up with the rich districts in upcoming years. Patna having higher no. of colleges than any other districts. So, Patna having high no. of primary schools in all districts of Bihar.

11. TOTAL NO. OF UPPER PRIMARY SCHOOLS IN BIHAR



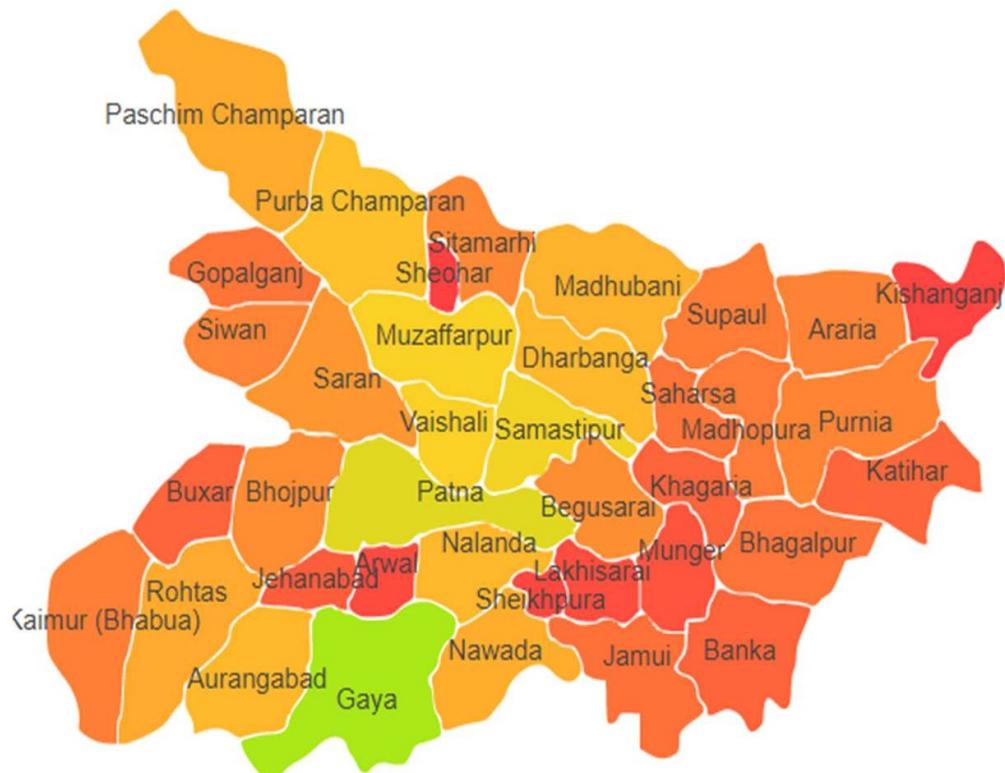
- Purba Champaran (East Champaran) having high no. of Upper primary schools in all districts of Bihar in 2017-18.
- Total no. of Upper primary schools in Purba Champaran: 1730
- Explanations: Higher no. of Upper primary schools also indicates the Government is providing full support for promoting the education in the district. Government is also spending a lot of money for providing free education to those children who are not able to pay high fees of private schools. Poorer districts like Gaya also have higher no. of primary schools. It also means poorer districts are also attracting towards education. With the help of education, poorer districts will catch up with the rich districts in upcoming years. Purba Champaran also having more no. primary schools. So, Purba Champaran having high no. of Upper primary schools in all districts of Bihar.

12. PROJECTED FERTILITY RATE IN BIHAR (2019)



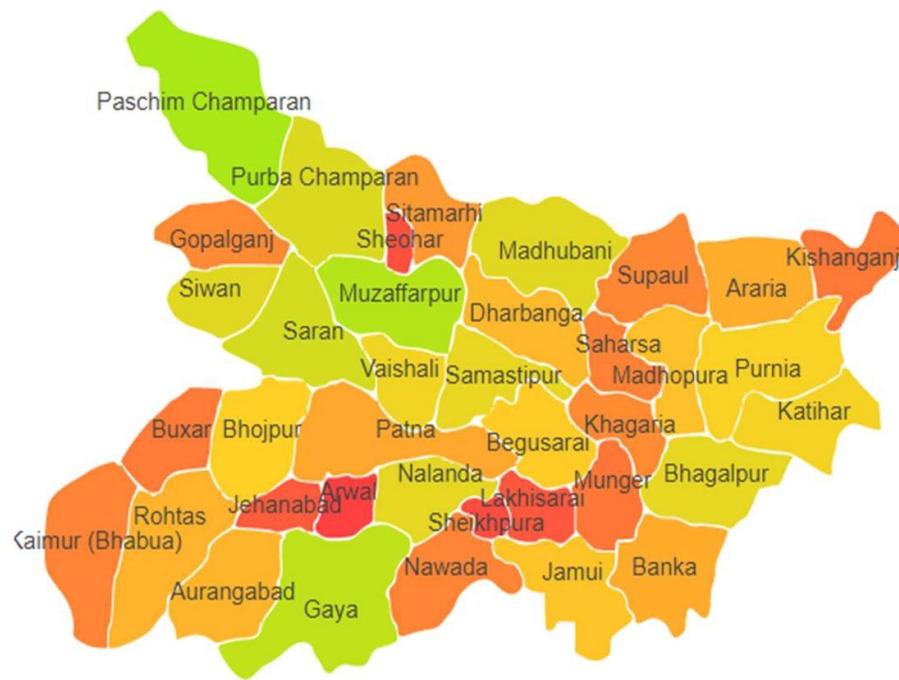
- **Gaya** having high projected fertility rate in all districts of Bihar.
- Projected fertility rate in Gaya: **2.39**
- Fertility rate defines as average no. of children per women.
- Explanations: Higher fertility rate results into the higher population of that area. Fertility rate measures as no. of average no. of children per women. Poverty is the main cause for the higher fertility rate. Gaya district is one of the poorer districts of Bihar. Poor people cannot afford contraceptive products like condoms etc. and there have no other source of enjoyment. It may also have others reasons like ambition of the son's child.

13. NO. OF BPL FAMILY IN BIHAR (2015-16)



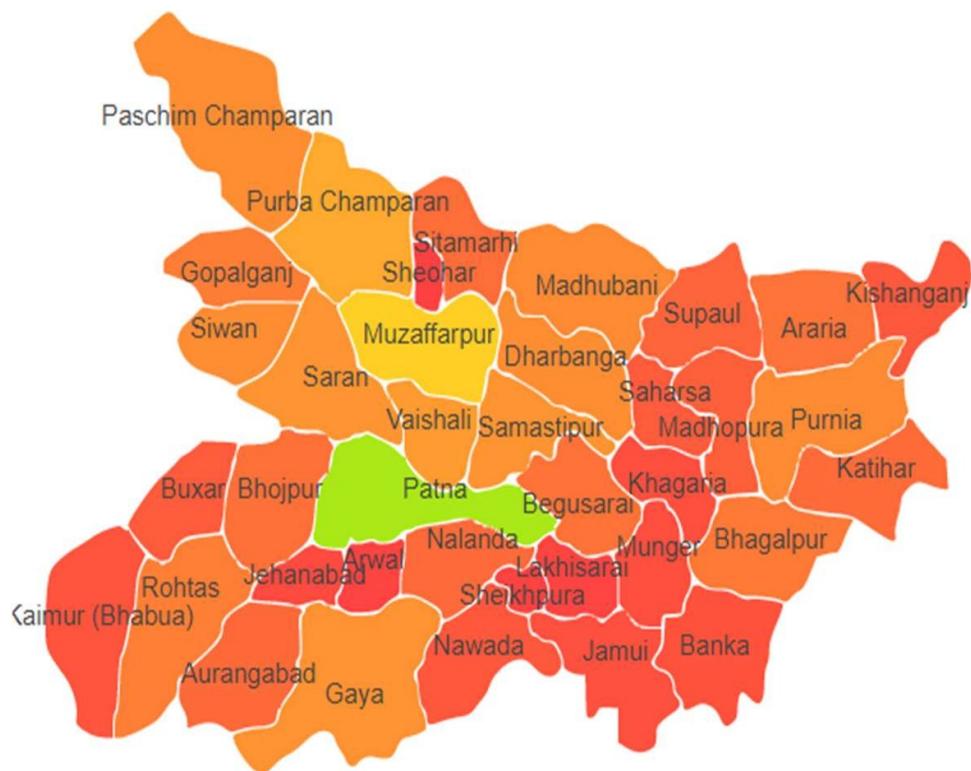
- Gaya having high no. of BPL families in all districts of Bihar in 2015-16.
- Total no. of BPL families in Gaya: 1334351
- BPL means Below Poverty Line which is used as benchmark by the government of India to indicate economic disadvantage and to identify individuals and households in need of government assistance and aid. It is determined using various parameters which vary from state to state as well as within the states.
- Explanations: Gaya is one of the poorer districts in Bihar. And Gaya also having higher no. of villages in all districts of Bihar. Generally, Poor people lives in the rural areas (i.e. village), they cannot afford a good life with all necessary facilities. For BPL family, Government is providing ration at very low prices as compared to the market. Generally, Patwatoli is a village in the Gaya district. Most of the people are involved in weavers and agricultural activity.

14. NO. OF HEALTH SUB CENTRES IN BIHAR (UPTO SEPT. 2019)



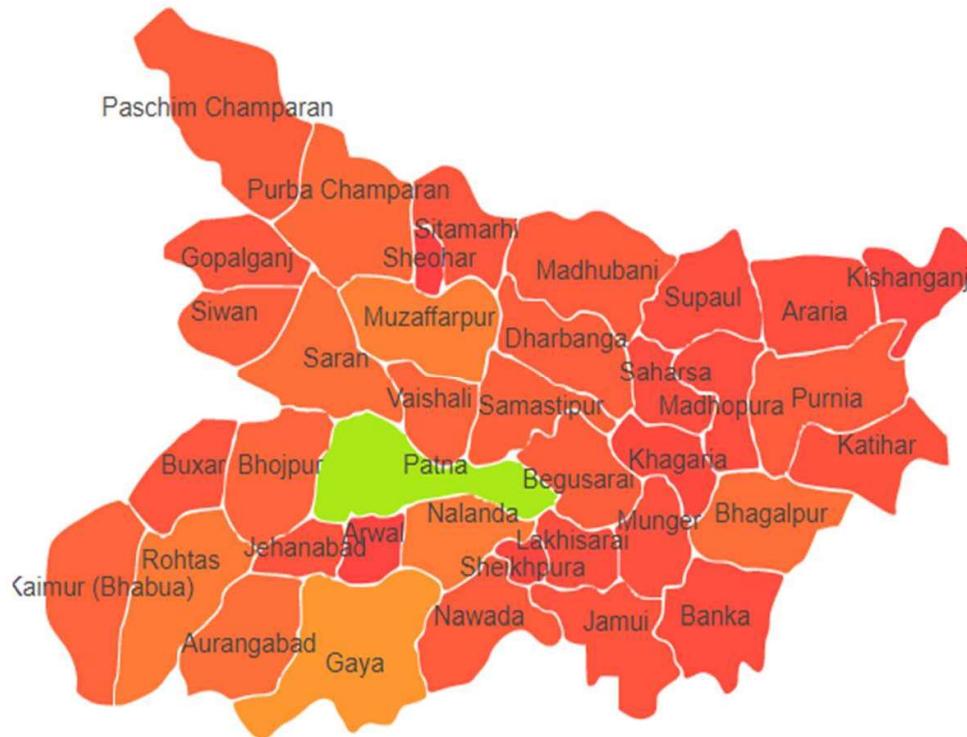
- **Paschim Champaran (West Champaran)** having high no. of health sub centres in all districts of Bihar up to Sept. 2019.
- No. of Health sub centres in Paschim Champaran: **149**
- Health sub centre is the most peripheral and first contact point between the primary health care system and the community.
- Explanations: Health sub centre is one of the most necessary infrastructure facilities in any locality. Health sub centre is very important for the rural area. Because poor people cannot afford good medical facility in private hospitals. As per the above map, Paschim Champaran, Gaya, Muzaffarpur have high no. health sub centres because they have more no villages than others districts.

15. PETROL CONSUMPTION IN BIHAR (2018-19)



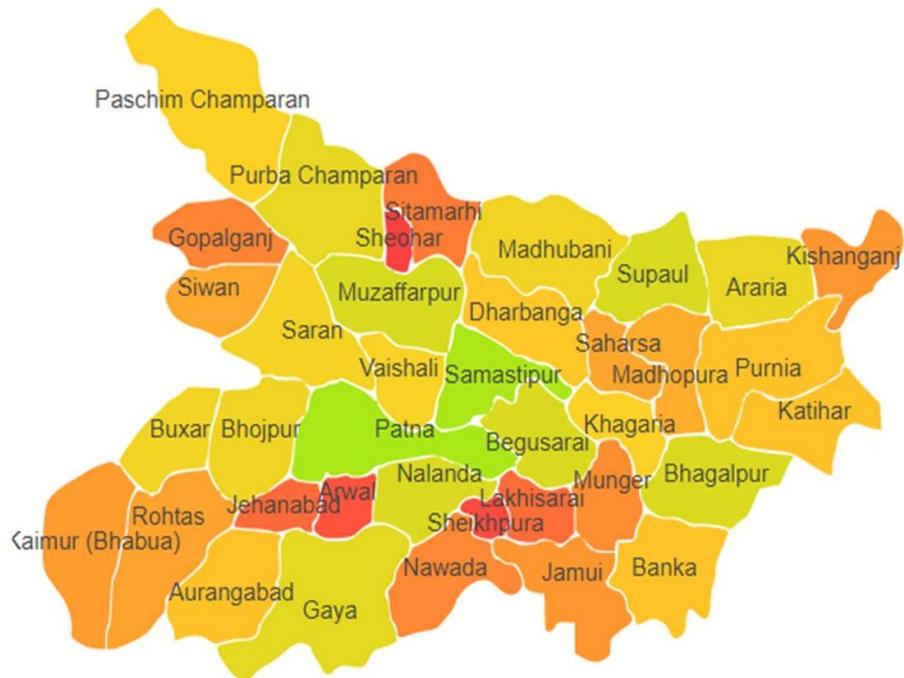
- **Patna** having high consumption of petrol in all districts in Bihar during 2018-19.
- Petrol consumption in Patna: **99.8 TMT**
- Explanations: Why Patna having high consumption of petrol than others? Patna is the richest district in the Bihar. Large no. of colleges, other institutions, Industries and other things are present in Bihar. And Patna having more no. of two wheelers, four wheelers and other vehicles than others districts of Bihar. So, the consumption of petrol is so high in Patna, more than other districts of Bihar.

16. POWER CONSUMPTION IN BIHAR (2018-19)



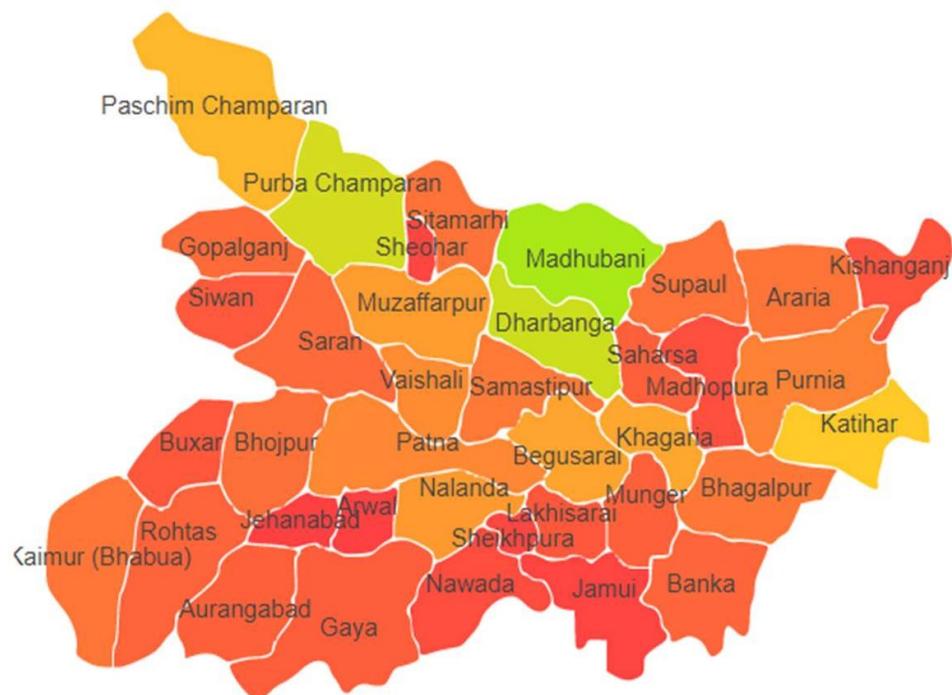
- Patna having high power consumption in all districts of Bihar during 2018-19.
- Power Consumption in Patna in 2018-19: **5236 MU**
- Explanations: Electricity is one of the most essential facilities of Infrastructure. Electricity is required for operating any institution, colleges, industries, hospitals and households etc. Patna is more developed than other districts. Generally, electricity provided in urban areas is more than rural areas. Patna is on top in the criteria of urbanisation. So, Power consumption in Patna is highest among other districts of Bihar.

17. MILK PRODUCTION IN BIHAR (2018-19)



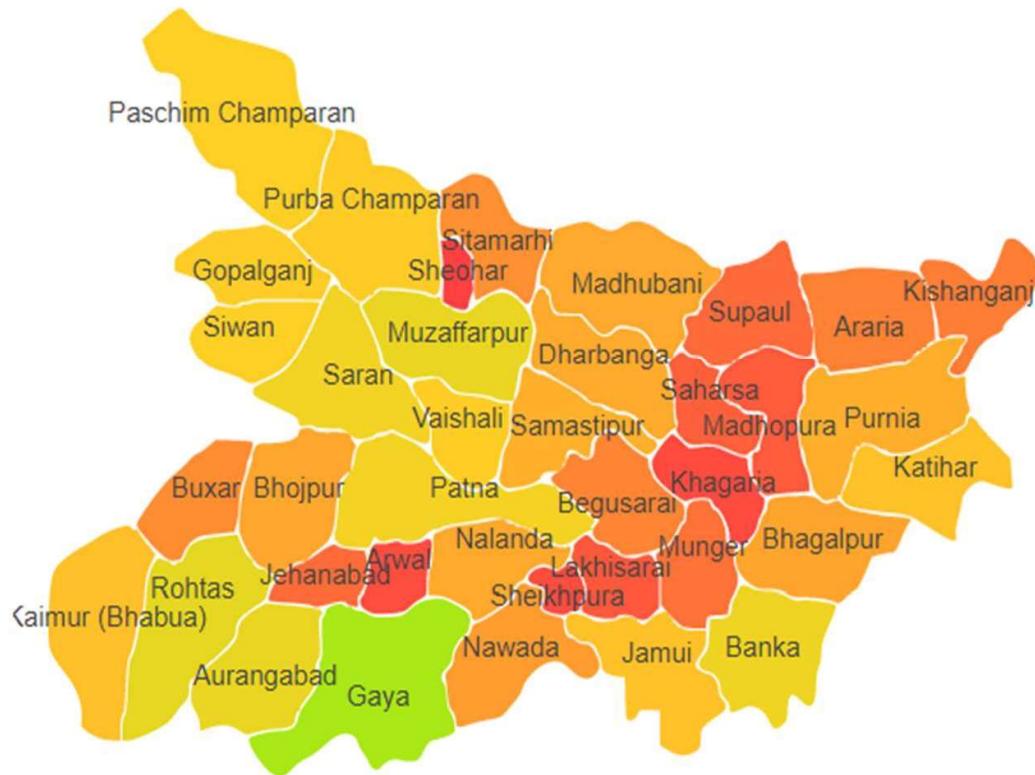
- Patna having high milk production in all districts of Bihar in 2018-19.
- Milk production in Patna in 2018-19: **501.73 ('000 tonnes)**
- Explanations: Milk is so healthy for human being. Milk is produced by cow, buffalo, goat, and other animals. Milk production is directly proportional to the no. of livestock present in the district. Patna having more livestock than others. Samastipur district is neighbour of Patna which also have good milk production in 2018-19. That's why Patna have higher production of milk.

18. FISH PRODUCTION IN BIHAR (2018-19)



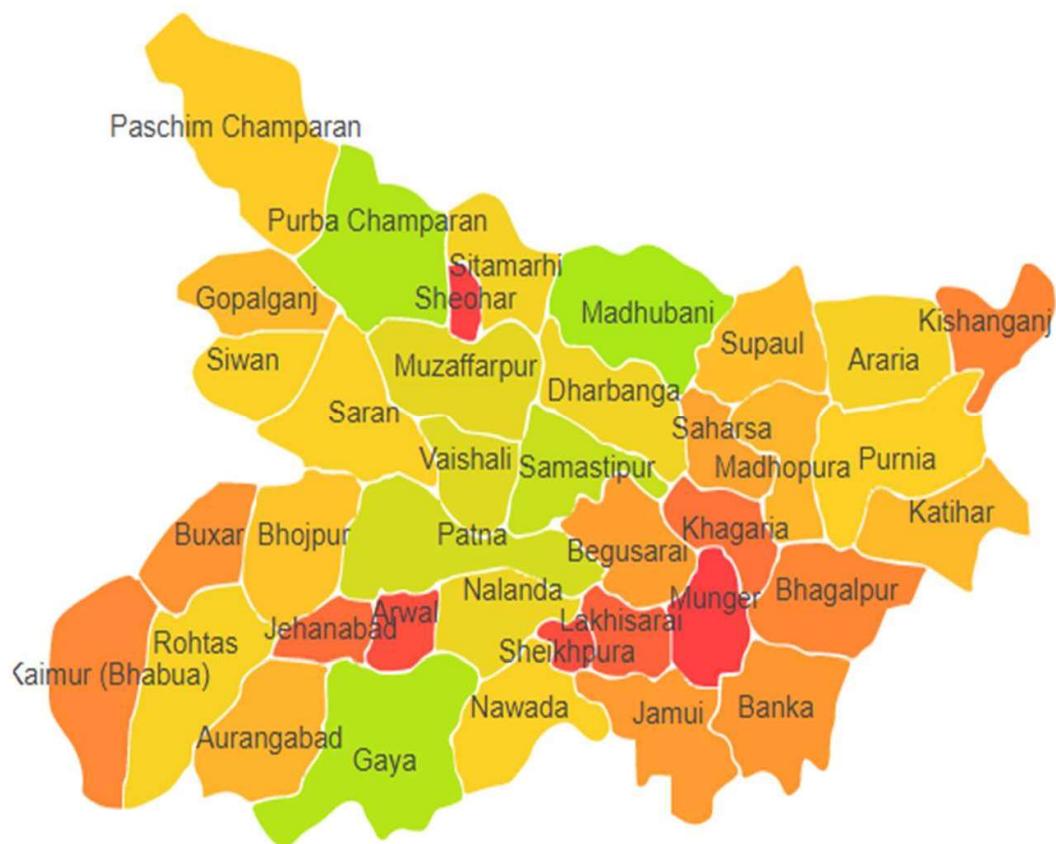
- **Madhubani** having high production of fish in all districts of Bihar in 2018-19.
- Fish production in Madhubani: **68.70 ('000 tonnes)**
- Explanations: Madhubani is the poorest district among all the districts in Bihar. Madhubani is famous for art and painting. Generally, their painting is motivated by the village culture. There are many main rivers like Kamla, Kareh, Gehuan, Koshi, Trishula etc. Fishing is the one of the most useful profession for the peoples of Madhubani. It is the main source of income for the most of the peoples.

19. NO. OF VILLAGES IN BIHAR (IN 2011)



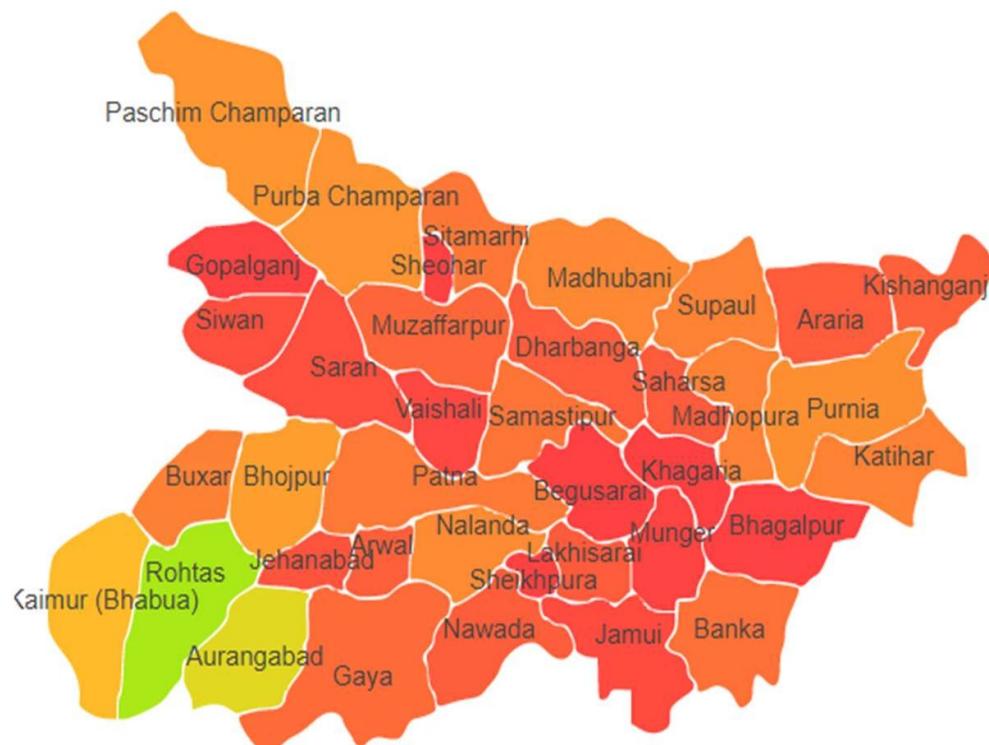
- **Gaya** having high no. of villages in all districts of Bihar according to census 2011.
- Total no. of Villages in Gaya: **2865**
- Explanations: Gaya is one of the poorest districts in Bihar. Most of the geographical area in Gaya comes under rural area. It is on the second place in the rural area but total geographical area of Gaya is larger than that (1st place district). Rural area is directly proportional to no. of villages. So, no. of villages in Gaya is highest among all the districts of Bihar.

20. NO. OF MAIN CULTIVATORS IN BIHAR (IN 2011)



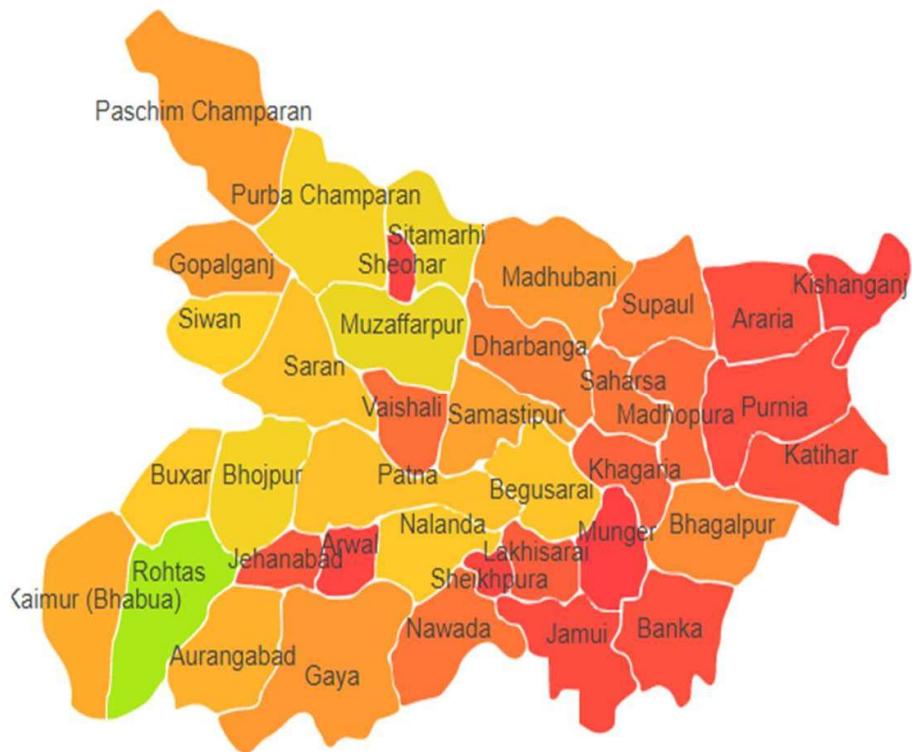
- **Madhubani** have high no. of main cultivators in all districts of Bihar.
- No. of main cultivators in Madhubani: **289095**
- Explanations: Main Cultivators are generally lives in the rural area. So, the higher no. of main cultivators is in that district which have large rural area. As per the above map, Madhubani, Gaya, Purba Champaran having high no. of main cultivators than others. Madhubani is poorest among all districts that conclude, GDP per capita of that district is low. It also means that is most of the people are the farmers. So, Madhubani having high no. of main cultivators in all districts of Bihar.

21. RICE PRODUCTION IN BIHAR (IN 2018-19)



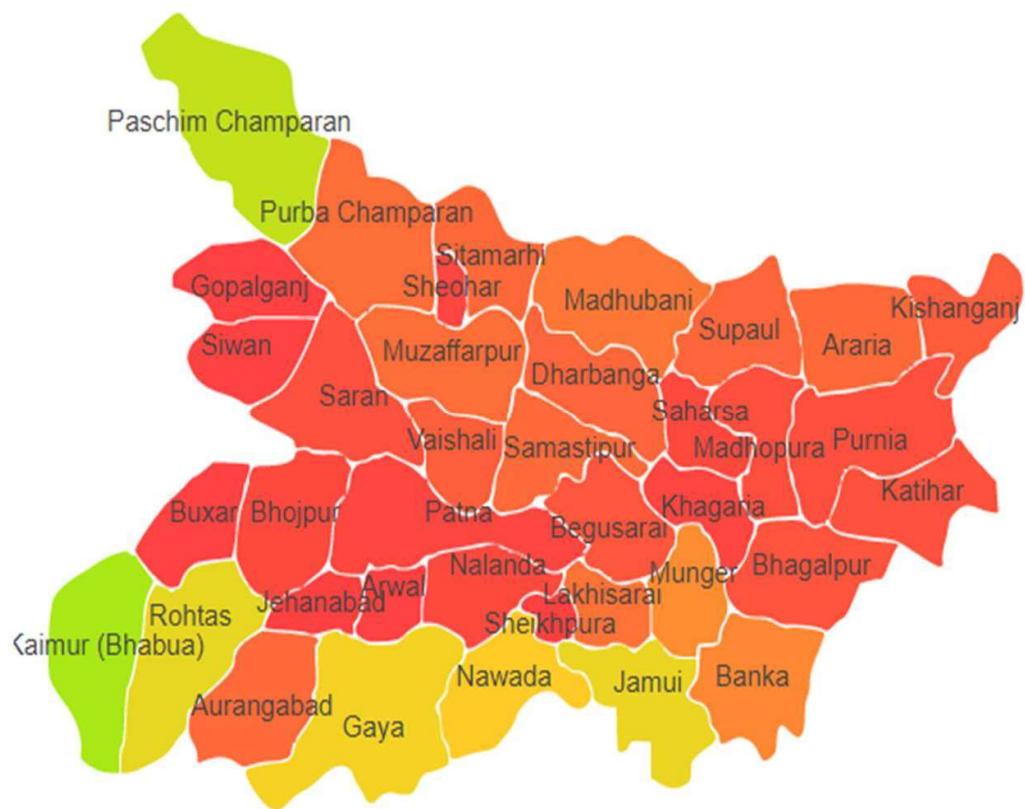
- **Rohtas** having high production of rice in all districts of Bihar in 2018-19.
- Rice production in Rohtas in 2018-19: **792.14 ('000 tonnes)**
- Explanations: The river Ganga passing through the Rohtas which makes agricultural field more productive that results into high productivity of different crops. The river Ganga is also useful for many purposes like irrigation etc. The 5 top producer districts of rice are Rohtas, Kaimur (Bhabua), Paschim Champaran, Gopalganj, and Supaul. Literacy rate of Rohtas is highest among all the districts. So, literate farmer uses different and suitable techniques for increasing agricultural productivity. So, Rohtas is the biggest producer of rice in Bihar.

22. WHEAT PRODUCTION IN BIHAR (IN 2018-19)



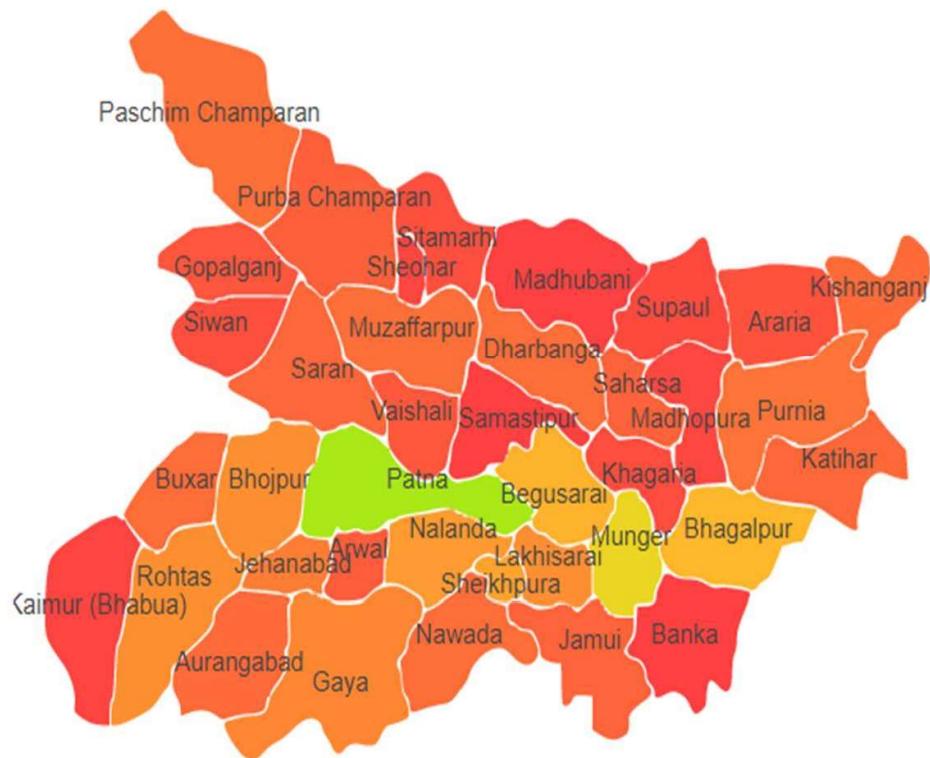
- **Rohtas** having high production of wheat in all districts of Bihar in 2018-19.
- Wheat production in Rohtas in 2018-19: **517.85 ('000 tonnes)**
- Explanations: Ganga river passing through the Rohtas which makes agricultural field more productive that results into high productivity of different crops. Ganga river is also useful for many purpose like irrigation etc. Literacy rate of Rohtas is highest among all the districts. So, literate farmers will use different and suitable techniques for increasing agricultural productivity. So, Rohtas is the biggest producer of wheat.

23. FOREST AREA IN BIHAR (IN 2019)



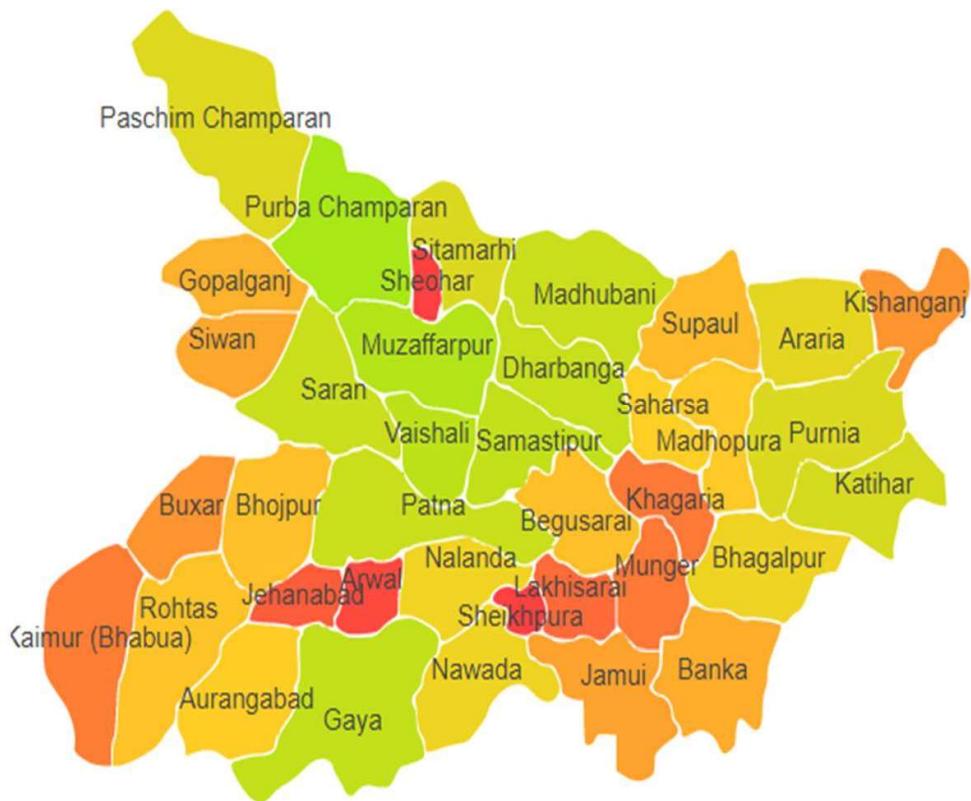
- Kaimur (Bhabua) having largest forest area among all the districts of Bihar in 2018-19.
- Total Forest area in Kaimur (Bhabua): **1056.4 sq. km**
- Explanations: Kaimur (Bhabua) district has a large forest area, about 106300 hectare which contains the Kaimur Wildlife Sanctuary, home for tigers, leopards and chinkaras. Purba Champaran having also large forest cover. Forest is good for the animals as well as human being. Forest is the home for wild animals like tigers, leopards. Elephant etc.

24. URBANISATION % IN BIHAR (IN 2011)



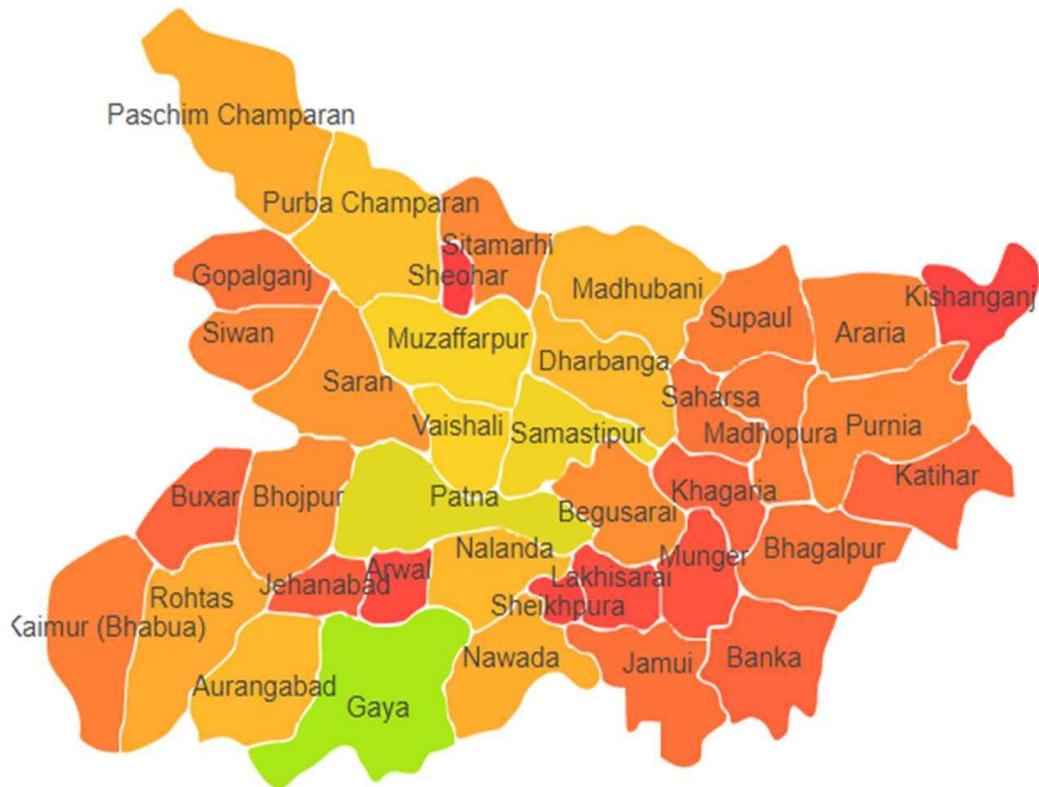
- Patna having high percentage of urbanisation in all districts of Bihar.
- Urbanisation of Patna in 2011: **43.1%**
- Urbanisation refers to the population shift from rural areas to urban areas, the decrease in the proportion of people living in the rural areas, and the ways in which each society adopts to this change.
- Explanations: As everyone knows, Patna is the most economical district in Bihar. Maximum of the area of the Patna districts comes in the category of urban area. This time people from the rural area want to shift in urban area because of the infrastructure facilities. In urban area, education or medical facilities is the highly better than rural area. So, Patna is on the top in the ranking of urbanisation.

25. NO. OF HOUSEHOLDS ISSUED MGNREGS JOB CARDS (2018-19)



- Purba Champaran (East Champaran) have high no. of households issued MGNREGS job cards in all districts of Bihar during 2018-19.
- Total no. of households issued MGNREGS job cards in Purba Champaran: 7.1 lakh
- Explanations: Mahatma Gandhi Employment Guarantee Act is the way by which the people belonging to the rural areas of India given an employment opportunity up to 100 days in the financial year for their families. The nature of the work under this scheme is unskilled Labour work. MGNREGS Job card is the primary document which identifies an individual who is registered with the local Gram Panchayat under this scheme. The payments given to the entire worker are now distributed through their Jan Dhan bank account. Centre districts of Bihar having higher no. of Household issued MGNREGS Job card.

26. SCHEDULE CASTE POPULATION IN BIHAR (IN 2011)



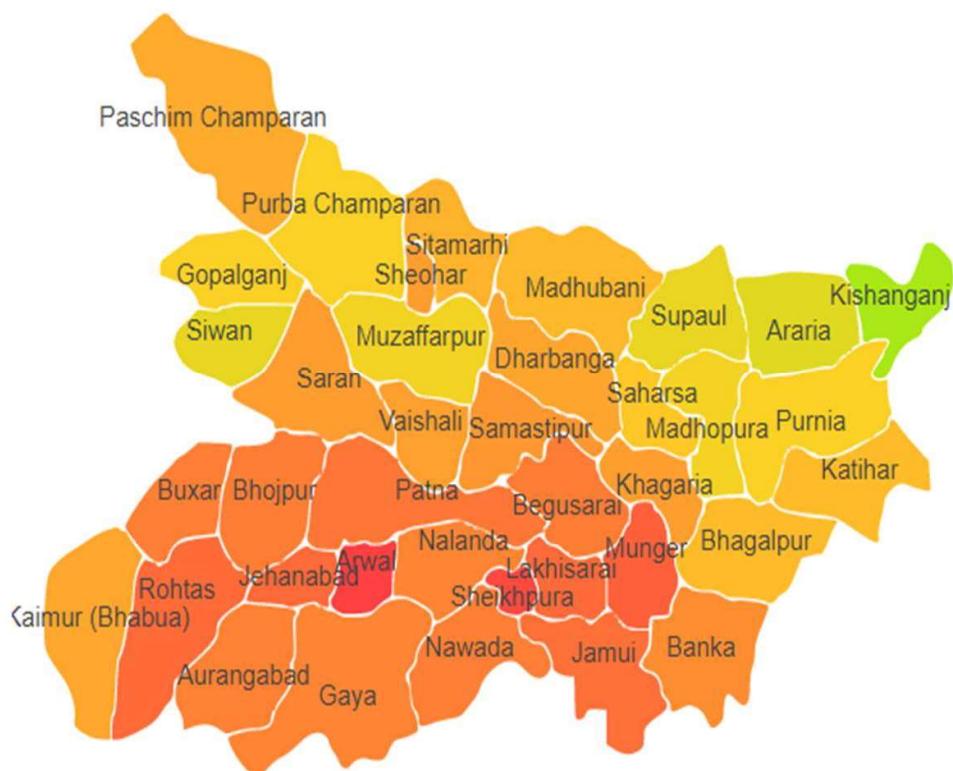
- **Gaya** having high population of schedule caste in all districts of Bihar in 2011.
- Total SC population in Gaya in 2011: **1334351**
- Explanations: Which caste comes under SC in Bihar? There are main six caste comes under the category of SC are following- Musahar, Pasi, Dhobi, Bhuiya, Chamar and Dusadh. Schedule Caste (SC) constitutes 30.4% of total population of Gaya district. Gaya is on the second spot in overall population. So, Gaya having high SC population in all districts.

27. SCHEDULE TRIBE POPULATION IN BIHAR (2011)



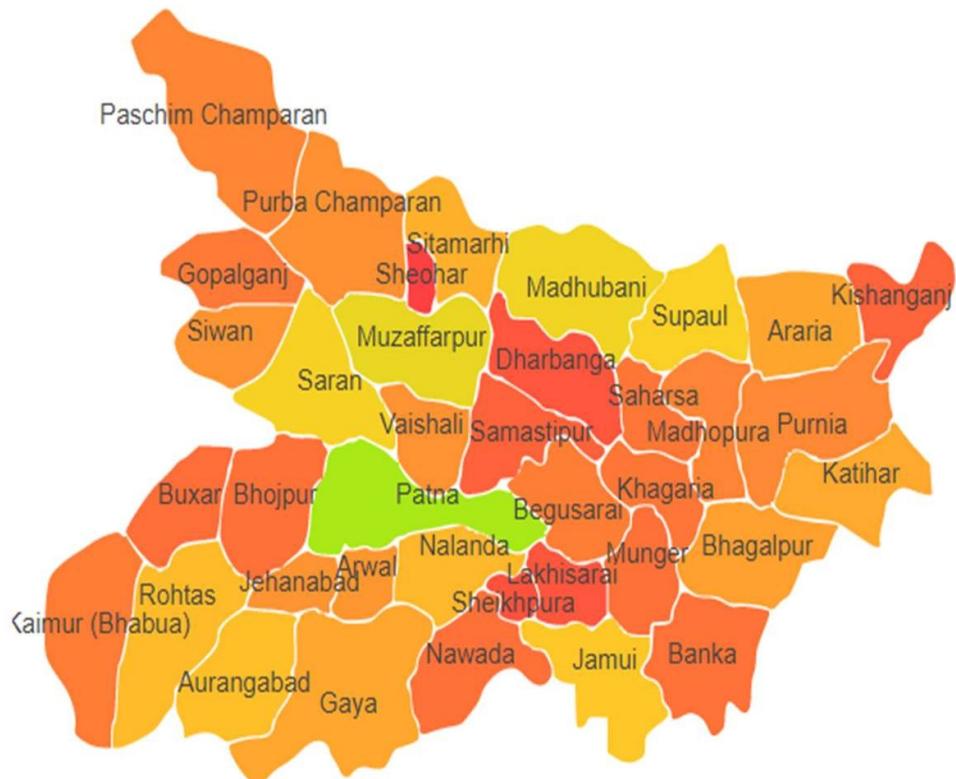
- **Paschim Champaran** (West Champaran) having high population of schedule tribes in all districts of Bihar in 2011.
- Total ST population in Purba Champaran: **250046**
- Explanations: Which caste comes under ST in Bihar? Lohara, Gond, Kharwar, Asur, Banjara and many more caste comes under the ST category. Schedule Tribe (ST) constitutes 6.4% of total population of Paschim Champaran district. So, Paschim Champaran having high ST population in all districts.

28. ANNUAL RAINFALL IN BIHAR (UPTO SEPT. 2019)



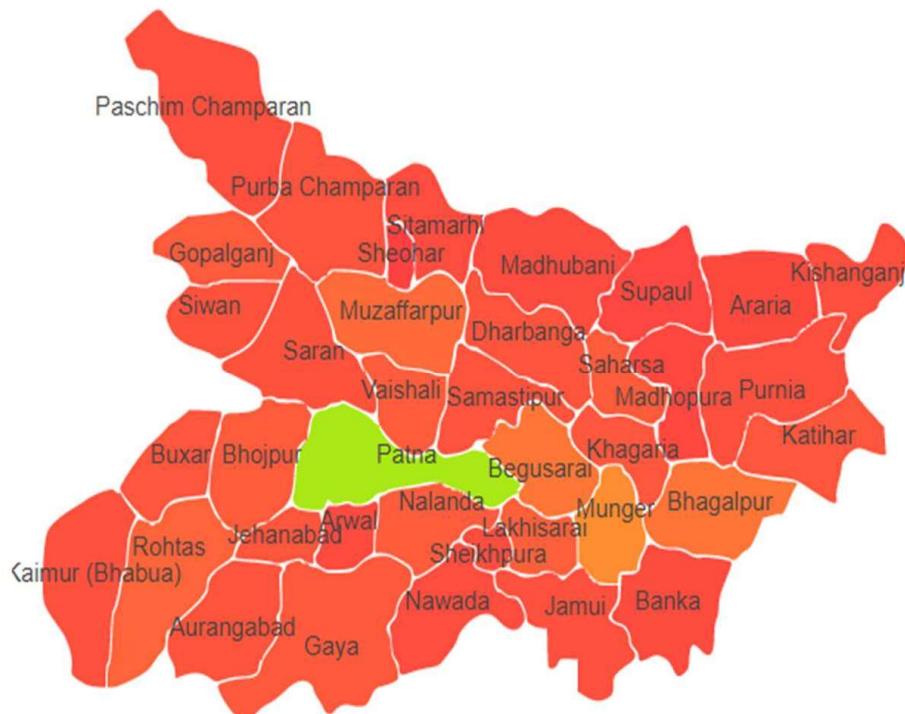
- Kishanganj have high value of annual rainfall in all districts of Bihar up to Sept. 2019.
- Annual Rainfall in Kishanganj: **1951.8 mm**
- Explanations: Rainfall in Kishanganj is high during summer season (in the month of June, July and August). The 3 main factors that affect rainfall are prevailing winds, the presence of mountains, and seasonal winds.

29. NATIONAL HIGHWAY NETWORK IN BIHAR (UPTO SEPT. 2019)



- Patna having high value of national highway network in all districts of Bihar.
- National highway network in Patna: 395 km
- Explanations: National highways in India are a network of trunk roads that is owned by the Ministry of Road Transport and Highways. Generally, National highway network facilities available in the urban areas. As we know, Patna having high value of urbanisation. So, Patna is on the top of national highway network.

30. PER CAPITA GDDP (2004-05) PRICE (2011-12)



- Patna having high value of GDDP per capita (base year 2004-05) at constant price (2011-12) in all districts of Bihar.
- GDDP per capita (base year 2004-05) at constant price (2011-12) of Patna: **63063 Rs.**
- GDDP per capita is a measure of a district's economic output that accounts for its number of people. It divides the district's gross domestic product by its total population. That makes it a good measurement of a country's standard of living.
- Explanations: Patna is highly developed as compared to other districts of Bihar. Patna having high no. of colleges, higher power consumption, higher petrol consumption, and higher % of urbanisation and others. These all factors indicate that Patna is richest district in Bihar. It means, Patna have higher GDDP per capita than other districts of Bihar.