

Pandey, Aviral

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Inequality in Bihar: A District-Level Analysis

Abstract

Bihar was one of the moderate developing states in India before 2005. However, after 2005 Bihar emerged as one of the fastest growing states, but it has emerged as a tertiary sector income based economy, saddled with negative growth in the agriculture sector and high out-migration. The state is also devoid of the industry. It is broadly acknowledged that after 2005, construction became a top priority of the government instead of addressing the agricultural crisis and think about developing appropriate health infrastructure facilities. Centralised growth of few districts is another lopsided aspect of the present government in the state. Given this background it is important to see emerging district-level disparities and hardships in Bihar.

Keywords: Agriculture, Bihar, District, Government, Inequality.

Author Detail:

Aviral Pandey
Assistant Professor
A N Sinha Institute of Social studies
Patna, Bihar
Email: aviral.ansiss@gmail.com
Mob: 8987100796

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Abstract

Bihar was one of the moderate developing states in India before 2005. However, after 2005 Bihar emerged as one of the fastest growing states, but it has emerged as a tertiary sector income based economy, saddled with negative growth in the agriculture sector and high out-migration. The state is also devoid of the industry. It is broadly acknowledged that after 2005, construction became a top priority of the government instead of addressing the agricultural crisis and think about developing appropriate health infrastructure facilities. Centralised growth of few districts is another lopsided aspect of the present government in the state. Given this background it is important to see emerging district-level disparities and hardships in Bihar.

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Introduction

Inequality is likely to be present in India as still a large percentage of the work force is employed in a sector (agriculture), where productivity is comparatively low. Agriculture provides jobs to around half of the total workforce, while this sector is contributing less than twenty per cent to the GDP of India. Also, after the introduction of the LPG-regime, labour movements (Labour Unions) are weakening day by day (Ambedkar & Prashad 2020) and this may be a possible responsible reason that the share of labour wages in total production or income is declining in India even there is positive and significant growth in national income (ILO 2019). Including other countries, India is also experiencing augmented privatisation in education and health sectors. It is expected that high privatisation in health and education may force households to spend more on these services. It can affect the wealth creative capacity of low income households and may further promote inequality between rich and poor in India (Mishra and Joe 2020). On the other hand, increase in tax benefits to corporate and rise in the amount of NPAs (Non Performing Assets) may also encourage inequality between haves and haves not if

saved tax amount and NPA are not used for employment creation (Golder and Gupta 2017). Here, it is important to see that “is this situation is similar in case of all states or situation is states of India”.

At the outset, one can see severe within inequality in both, rich and poor states of India. It is widely acknowledged that rising inequality in a state not only affects growth of the concerned state, but also overall growth of the country. Thus, it is essential that every sector (economics, etc.) and every state should perform well. Unfortunately, there are some states which are performing well in case of reduction in the level of regional inequality, but others are not performing well. This situation is more disastrous in a state like Bihar (Mishra and Joe 2020). It is also true that Bihar witnesses diverse types of natural disasters throughout the year and the major ones being flood and drought. Impacts of natural disasters get amplified due to high population density and widespread poverty in disaster-prone areas/districts. Natural disasters impose strong setbacks on the state economy, especially on livelihood generating sectors like agricultural and animal husbandry and, years having a major natural disaster drags the state domestic product down in that particular year.

It can be seen that Bihar’s income level, health situation (in terms of decline in infant mortality rate) and literacy level (As per Census’s definition) have improved after 2005, still the challenge lies in case of inequality across districts of Bihar. Fact remains that this state is among top states in terms of growth in income, but facing serious problems related to health facilities. Even after high growth only few districts have performed well and still most of districts are homes of poor people in the state. It is widely acknowledged that after 2005, building Road, over-bridges and buildings became top priority of the present government in the state instead of addressing the agriculture crisis and think of developing

proper health infrastructure facilities. It is being said that centralised growth of few districts is a specific nature of the present government in the state. Given this the present exercise intends to present the emerging dimensions of micro-level disparities and deprivations in Bihar. This study is mainly based on data published by the government of India, Government of Bihar, NSSO and Census.

Theoretical Framework

The seeds of debate on inequality can be seen in the work of Classical Economists Adam Smith, the purported founding father of laissez-faire capitalism. But, Smith was mainly concerned by poverty but not by the economic inequality itself. This was further carried out by the work of David Ricardo. He emphasised that in the steady state rate of profit will be zero and output will be shared between rents and wages. But, Pasinetti (1965) was in opinion that the distributive disagreement comes into view between wages and profit, before the economic system reaches the steady state. Marx clarified this conflict more clearly in his economic analysis via introducing the notion of surplus value. Thus, it can be seen that the classical economist addressed the problem of inequality mainly using the income distribution function (Bendix 1974).

In 1870, after the Marginalist revolution, the centre of analysis changed from production towards distribution of income (Wicksell 1893). The focus of analysis shifted from functional income distribution to personal income distribution. They advocated that income inequality is simply a result of the contribution of each productive factor (and productivity is not same) to the production of income. But they were not in the favour of any public policy because they believed that market forces will ensure that productive factors will be paid on the basis of their contribution. Thus, inequality

disappeared from the debate of mainstream economics. But, in the modern economic literature after the work of Simon Kuznets (1955) again inequality emerged as an agenda of discourse in modern world. Later studies on this issue advocated that it is not growth per se, which gives rise to economic inequality but it is the nature of economic growth (structure of output, the degree of economic dualism, the structure of employment, the distribution of land, the operation of capital markets and the overall level of human capital) which determines the rise of inequality (Fields 2001). On the other hand, economist like Stiglitz (2012) talks about the reverse of this relationship and advocates that economic inequality affects the pace and the nature of economic growth and, not the growth affects/creates inequality (as supported by Bourguignon 2004 and Ehrhart 2009). Thus, there is a wider consensus on the matter that inequality is not good for economic growth as it slow down the pace of economic growth.

Structural tradition of research on inequality believes that inequality exists and persists in the society, because different social groups have unequal access to socially relevant resources and power inequality exists and persists in the society. This unequal distribution persists because each generation passes on its resources to the next, so that power and resources “remain in the family” (Bendix 1974). Overall, as per structural tradition of researches inequality is a multidimensional phenomena (as Amratya Sen has also advocated). There are certain factors (economic, social, etc.) which play important role in raising inequality. A section of scholars have concentrated on the role of human capital in inequality (Becker 1964; Mincer 1974; Autor et al. 2007; Bravermann 1974; Mills 2008). They also believed that labour market institutions are also important as large parts of the population are part of labour class in the society. Range of labour contracts and laws, unionisation of the workforce and

the existence and degree of coverage of collective bargaining are crucial for the increase in inequality. Brunori et al. (2013) identified the role of birthplace, gender, race, education level of parents, and family background in explaining income inequality across countries. They found negative correlation between inequality index and intergenerational mobility. This shows that, if there is higher level of inequality in society, there is low possibility to improve the relative position in the social hierarchy. Following the theoretical framework studies have tried to explain inequality in states of India (Dutt 1940 ; Dreze and Sen 1995 ; Ravallion and Datt 2002 ; Himanshu 2018). But, limitation of the framework of analysis of the approaches used in these studies is that they sometimes fail to explain inequality in society like Bihar as the problem of inequality is path dependent in reality (historical structure).

Economy of Bihar: A Brief Overview

As a state Bihar has many achievements to cheers in areas of education, governance, society or religion. Bihar was one of the prosperous regions in Ancient India. In the past, the state had experienced remarkable economic engagements with other states of India and other countries. But, at present Bihar is at lowest ranks in many indicators in India (5th SFC 2016). Scholars like, “Romila Thapar” and “Rohrabacher” stated that the fall of Bihar took little more than a decade, beginning in the mid-1950s. Each successive decade only added another layer of misery. Comparison of growth of national income of states shows that situation of Kerala was also not good during 1960-1987 and growth in real NDP was less than one for both states, namely Bihar and Kerala. But, Kerala did very well during 1987 to 2004. On the contrary there has been long-term stagnancy in the growth rate of income in case of Bihar. Thus, Bihar (including Assam) continued to lose its ground and the divergence (in growth rate of income)

increased during the 1990s between Bihar and other states. The growth rate of economy in Bihar was only 2.7 per cent and it was 3.4 per cent lower than that of all India average during 1991-2001.

After Nitish Kumar takeover the charge of Chief Ministership of the state, things began to change. And, this could be achieved due to reduction (in case of income) on its dependency on agriculture after 2004 (Ghate and Wright 2012). As we know that economic growth is a major precondition for human resource development and poverty reduction. Thus, we see some significant positive changes in terms of rise in literacy rate and improvement in nutritional indicators in case of Bihar. Simultaneously, some remarkable impact of growth on poverty reduction has been observed in case of Bihar (second highest decline in poverty across states) during 2004-05 to 2011-12.

The economy of Bihar continues on a path of high growth which is assisting in the development transformation of the State. The real GDP growth rate remains impressive at 10.5 percent in 2018-19 with improved growth performance in trade, repair, hotels & restaurants, road & air, energy, gas, water supply, other utility services, and construction. There is a strong rebound in the services sector with double-digit growth continuously for two years since 2017-18. Growth of economy in Bihar was associated with lowest inflation (1.25 per cent) in India during October 2018 to October 2019. There are reasons to believe that the considerable decline in the incidence of poverty witnessed in the past decade is holding its ground and momentum in the wake of sustained efforts on the part of the State Government to address the distributional concerns in the society in terms of affirmative action and government interventions for increase in Job and Self Help Organisations (more than ten lakhs). Indeed, Bihar's economy is poised to take off and consolidate its recent gains with

strong leadership, to some extent informed evidence-based policymaking and implementation of public programmes.

Still, challenges lie in terms of governance and leakages in implementation of public programmes. A very high poverty ratio (in comparison to other states) and persistence of poverty with high outmigration characterize the state economy. According to the latest Planning Commission estimates the percentage of the population poverty line in Bihar was 33.7% (fifth across states in terms of poverty in India) as compared to 21.9% at the national level. It is also true that still the state is predominantly an agriculture-based economy, with around 50% of its total working population (PLFS, 2019) are involved in it. But, more than 50 percent of total workers employed in agriculture sector are employed as labourer (as per data given on the website of Census for year 2011). The percentage of agricultural labourers exceeds more than one-third of the total work force (Main) in Bihar. The percentage of agricultural labourers exceeds more than fifty percent in around one third of total districts. The agriculture of the state is characterized by low production with wide fluctuation in crop output. This situation is constantly hit the agriculture based community mainly due to uncertain weather conditions and a lack of assured irrigation facilities in one-third of total arable areas. The state is characterized by a less diversified economy with heavily dependent on uncertain agriculture. The economic backwardness of the state is reflected in several dimensions (as reported in government documents). These dimensions are broadly grouped into (a) output variables such as, low per-capita income, low agricultural yield and low per capita manufacturing outputs, (b) low use of agricultural inputs such as, chemical fertilizer consumption per hectare and electricity consumption per capita, (c) financial variables such as, low credit deposit ratio and low government tax revenue (direct tax

collection Per capita was the lowest (in Bihar) in 2016-17 with less than 6 percent of tax GDP ratio), (d) and poor management of resources, etc.

Review of economic survey of different years of Bihar gives indication of the financial situation and expenditure details of the state (Tiwari and Surya 2019): Besides all, the size of government expenditure has increased since 2005. But, the expenditure on education and health as a ratio to aggregate expenditure has been almost constant between 2002 and 2019. Bihar is worst performer in case of per capita health expenditure across states of India and Bihar is second worst performer in case of health expenditure as a percentage of total state expenditure. The fiscal situation decides growth initiatives of the state government. Unfortunately, data shows that the state depends on central transfer for most of their revenue (around 76 percent during 2015-2020). During the 2015-2020 period own tax revenue of the state has witnessed lower growth (around 6-7 percent) than most of the states of India. Due to alcohol prohibition enforced on 1 April, 2016 revenue from excise duty came down to nearly zero in the following years. In 2019-2020 the share of stamp duty in state's own tax revenue was the highest in Bihar in comparison to other states. This may be because of increase in demand for land due to re-establishment of law and order under the Nitish Kumar led government. During the 2015-2020 period the share of committed expenditure (it mainly includes expenditure on payment of salaries, pensions, and interest payments) in the state is the second lowest (34 percent) across 29 states of India. During the years 2013 and 2018 Bihar (44%) saw a second highest growth in the guarantee given by the state (for the borrowings of State Public Sector Enterprises from financial institutions) in India. It indicates the deterioration in the situation of State Public Sector Enterprises in Bihar in accessing

loan from financial institutions in the state. On the other hand, the amount of outstanding liabilities (at the end of March) has reduced from 49.5 percent to 31 percent of GDP (Revised Estimate) between 2001 and 2019. Besides resources, quality of governance and law & order situation is also important for inclusive growth. The failure of land reforms is the crucial indicator of governance. After 2000 most of the chief ministers have been from nearest district/town of Patna. Thus, overemphasis on Patna and nearest town/district has led to regional disparity in development.

Sectoral Situation of Economy in Bihar

The improvement in the growth trajectory of the State over more than ten years can be attributed to several initiatives and improvement in structure of economy. At present service account for around 60 percent, secondary sector accounts for around 19 percent and agriculture sector accounts for about 21 percent of total GSVA (Gross State Value Added at 2011-12 Constant Prices in year 2017-18). The fact “that the share of industry in output is not very high and agriculture continues to account for an imposing around 50 percent of the total workforce in Bihar” are matter of serious concerns that needs to be addressed in the upcoming years. Since 2012-13 agriculture is not able to perform consistent growth in Bihar. This was largely on account of vagaries of decline in rainfall and lack of irrigation facility. Still, the principal crop rice constitutes around 45 percent (in 2017-18) of total food grain production, recorded productivity of 24 Qtl/Ha in 2017-18. Government’s interventions on agriculture through “three agriculture road maps” have led to some significant improvements such as, increase in intensive agriculture and crop yield in the state. But, the gloomy situation of industry is the one of the lopsided part of the growth story of Bihar. The share of the secondary sector in total GSVA at around 19 percent is not very significant and

the share of manufacturing GSVA in the total industrial sector is only 42 percent, which is lower than the corresponding national average. During 2017-18, the mining sector grew at -12 percent, while the manufacturing & construction sectors grew at 1.3 percent and 7.0 percent, respectively and electricity, gas, water supply & other utility services (EGWUS) grew at 12 percent. During 2017-18, secondary sector grew at only 4.7 percent rate. A disconcerting issue relates to the low share of the industry in the total GSDP. The industrialization process in Bihar led to setting up/functioning of 3461 factories with a total investment of 19976 Crore rupees and employment of 1.04 lakh persons as of 2017-18 (Table 1). However, Bihar has cheap labour but it could not make Bihar a favoured destination for investors. After bifurcation of the state, Bihar does not have large industries in significant number. But, food processing, dairy, and manufacturing are some of the growing areas in Bihar in recent years (as per Economic Survey of Bihar of year 2020).

Table 1: Estimate of Some Important Characteristics of Factories for the Year 2017-2018

All Industries (Value figures in Rs. Lakh, others in Number)	All India	Bihar
Characteristics		
1. Number Of Factories	2,37,684	3,461
2. Fixed Capital	32,85,88,927	19,97,672
3. Number of Workers	1,22,24,422	1,04,057
4. Total Persons Engaged	1,56,14,619	1,21,772
5. Value of Output	80,72,17,258	60,02,667
6. Net Value Added	12,29,67,418	6,40,408
7. Net Income	10,50,78,789	5,66,999
8. Net Fixed Capital Formation	75,39,180	2,03,401
9. Gross Fixed Capital Formation	3,12,68,805	3,23,458
10. Gross Capital Formation	4,14,61,837	3,87,656
11. Profits	5,76,24,246	3,83,588

Source: ASI.

In line with the all-India trends, the services sector comprises a growing component of economy of Bihar. It accounted for 59 percent of GSDP in 2017-18 and is estimated to be over 61 percent in 2018-19. (In 59 percent) Trade & repair service (16.9 percent), Road Transport (5.1 percent), financial service (4.2 percent), Public Administration (5.5

percent), Real estate, ownership of dwelling & professional services (9.5 percent) and Other Services like education & health (12.4 percent) are the main drivers of the services sector in the state. The growth of the services sector for the 2017-18 was 13.1 percent (at constant prices). Railway, air transport, public administration and other services grew robustly by 20.1 percent, 24.4 percent, 33.5 percent, and 20.3 percent respectively in 2017-18. Financial services sub-sector also performed notably with a growth rate of 13.8 percent in 2017-18. Bihar has made noteworthy progress in financial inclusion. But, still the credit-deposit ratio is maintained at only 32 percent during 2017-18 as against the ratio of 75.6 percent at all India level.

Poverty in Bihar

An analysis of poverty is important to identify the effect of growth on poverty. In the past, poverty alleviation and employment generating programmes have been implemented in Bihar. But results of such initiatives are not very satisfactory. The problem of poverty has not improved much even in the years of high economic growth in Bihar. Poverty figure also show that decline in poverty is lower in percentage and number of poor has increased in Bihar between 2005 and 2010. It was told that 2009-10 was not a normal year (Drought) so a new survey was done in 2011-12. Between 2009-10 and 2011-12 Bihar experienced significant decline in poverty (See Table 2). The decline was higher in rural areas than urban areas, it was told that urban areas can bear drought better than rural areas. Thus, it can be expected that decline in agriculture performance in recent years would have expanded the degree of distress in Bihar. Structural change or the reallocation of jobs from low productivity to high productivity sectors is important to reduce poverty. Unfortunately, Bihar is experiencing slow employment diversification in India.

Table 2: Poverty in Bihar and India (Tendulkar Methodology)

		In Percentage			In Number (in Million)		
		Rural	Urban	Total	Rural	Urban	Total
Bihar	2004-05	55.7	43.7	54.4	45.1	4.28	49.4
	2009-10	55.3	39.4	53.5	49.9	4.48	54.4
	2011-12	34.1	31.2	33.7	32.04	3.77	35.81
India	2004-05	42	25.5	37.2	325.81	81.41	407.22
	2009-10	33.8	20.9	29.8	278.21	76.47	354.68
	2011-12	25.7	13.7	21.9	216.66	53.12	269.78
Change between 2005-2012							
		In Percentage			In Number (in Million)		
		Rural	Urban	Total	Rural	Urban	Total
Bihar	2005-2010	-0.4	-4.3	-0.9	4.8	0.2	5
	2010-2012	-21.2	-8.2	-19.8	-17.86	-0.71	-18.59
	2005-2012	-21.6	-12.5	-20.7	-13.06	-0.51	-13.59
India	2005-2010	-8.2	-4.6	-7.4	-47.6	-4.94	-52.54
	2010-2012	-8.1	-7.2	-7.9	-61.55	-23.35	-84.9
	2005-2012	-16.3	-11.8	-15.3	-109.15	-28.29	-137.44

Source: Author's Compilation using Government of India Press Note on Poverty.

Income Inequality and Demographical Change in Bihar

Here, an analysis is done to see that has the differences in income across districts reduced or widened in Bihar. As data for per capita district domestic product (income) is available only till 2011-12, so analysis could be done for period of 2000 to 2012 to compare Pre 2005 and Post 2005 situation. Pre 2005 and post 2005 period wise analysis gives detail of effect of two governments (RJD led and JDU Led) on inequality in Bihar. An overall analysis has also been done to see the behavior of different districts between 1999 and 2012 in Bihar. Table 3 shows change in per capita income across districts of Bihar during 2000 and 2012.

Table 3: District Wise Distribution of Per Capita District Domestic Product (DDP) in Bihar

Division / District	Per Capita GDDP (1999-00 Prices) (in Rs.)															
	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	C.V. (1999-05)	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	C.V. (2005-12)	C.V. (2000-12)
Arariya	4290	4684	4224	4499	4353	4578	0.04	4782	5245	6635	7251	7376	8534	8776	0.22	0.29
Arwal	4382	4626	4451	4466	4962	4726	0.05	4911	5590	6475	7028	7283	8133	9125	0.21	0.27
Aurangabad	5161	5390	5419	5576	5499	5287	0.03	5364	6656	7575	7922	8189	9293	11012	0.23	0.27
Banka	4383	4516	4312	4698	4805	5316	0.08	5215	6302	6882	7596	7724	7756	9269	0.18	0.27
Begusarai	7738	8375	7951	9099	7573	9312	0.09	8956	10409	12419	15001	14235	18433	17587	0.25	0.34
Bhagalpur	6672	7048	7156	7580	7899	8268	0.08	8788	10205	12097	13351	14253	15870	17324	0.23	0.35
Bhojpur	5777	6916	6538	6055	5968	5786	0.07	6470	7604	8775	10146	10134	11537	12459	0.22	0.29
Buxar	5641	6135	5343	5592	5385	5303	0.06	6091	6940	8368	8992	8812	9732	11289	0.20	0.28
Darbhanga	4807	6546	5339	5381	5126	5574	0.11	5636	6473	7614	8516	9036	10798	10932	0.24	0.3
East Champaran	4664	5861	4422	6236	4989	5423	0.13	4936	6236	6223	8457	7571	8790	10735	0.26	0.29
Gaya	5607	5868	5738	6055	6175	6023	0.04	6289	7510	8660	9135	9519	10504	11897	0.20	0.28
Gopalganj	4916	5277	4978	4846	4992	5107	0.03	5447	6788	7646	8059	8543	10386	12129	0.26	0.35
Jamui	4640	4772	4490	4677	4693	4913	0.03	4665	5516	7584	8028	8186	8944	10166	0.25	0.32
Jehanabad	5024	5355	5172	5262	5465	5267	0.03	5586	6607	7490	8588	8478	9322	11182	0.22	0.29
Kaimur	5516	7057	5648	5829	5931	5452	0.10	5826	6568	7564	8441	7785	9539	10412	0.20	0.23
Katihar	5201	6656	5831	6583	6019	6779	0.10	6134	6902	8267	9060	9594	10721	11278	0.21	0.26
Khagaria	5137	5506	5148	5560	5628	6194	0.07	6749	7385	8517	9111	9642	10603	11515	0.19	0.3
Kishanganj	4892	5576	4968	5146	5104	5461	0.05	5543	6364	7312	8120	8085	9126	9928	0.20	0.26
Lakhisarai	5249	5619	5483	6147	5994	6188	0.07	6557	8087	9549	10209	10950	11870	13073	0.22	0.34
Madhepura	4652	5774	4751	5198	5008	5417	0.08	5095	5603	6920	6602	6979	8096	8609	0.18	0.21
Madhubani	4519	7158	5242	8440	4414	6851	0.27	4887	6416	6216	7643	7455	10607	9241	0.26	0.27
Munger	8778	8912	9244	9129	9711	10087	0.05	10637	12370	15791	17034	18554	21011	22051	0.25	0.37
Muzaffarpur	6697	6876	6759	7198	6824	7611	0.05	7465	8803	9814	11602	12159	14082	15402	0.25	0.32
Nalanda	5443	5867	5506	5831	5849	5727	0.03	6287	7102	8219	9152	9787	10971	12561	0.24	0.31
Nawada	4645	4799	4647	4974	4918	4657	0.03	4915	5856	6739	7409	7602	8437	9560	0.22	0.28
Patna	23063	24796	24606	27857	27605	31441	0.11	31302	37737	43448	48719	53428	57823	63063	0.23	0.36
Purnia	5070	6100	5359	5500	5490	5600	0.06	5598	6213	7419	8228	8743	9357	10099	0.21	0.25
Rohtash	6347	7090	6810	6921	6932	7138	0.04	7568	8611	9544	10950	10908	12265	13909	0.21	0.28
Saharsa	5732	6864	5872	6294	6082	6521	0.07	6324	7051	8164	8744	9591	11268	12197	0.24	0.27
Samastipur	5090	6739	5645	5474	4967	5783	0.11	5646	7871	7559	8729	8843	10705	10762	0.21	0.28
Saran	4640	5115	4744	5289	5057	5312	0.06	5583	6177	7522	7938	8559	9576	10615	0.22	0.3
Sekhpura	4903	5035	4583	5115	5109	4806	0.04	5430	6107	7209	8105	7775	8377	9687	0.19	0.27
Sheohar	3427	4470	3842	3874	4101	3636	0.09	3518	4398	5541	6128	5438	6208	7092	0.22	0.25
Sitamarhi	4353	4629	4633	4889	4260	4352	0.05	4490	5688	6180	7301	7456	8274	9538	0.24	0.3
Siwan	4654	4664	4652	4906	4846	5019	0.03	5338	8013	7377	8864	8042	9192	10685	0.20	0.32
Supaul	4761	4852	4849	5602	4692	5572	0.08	5197	6004	6382	6790	7043	8193	8492	0.17	0.21
Vaishali	5291	5479	4878	6171	4933	6018	0.10	5982	7333	7728	9604	9937	11591	12490	0.25	0.35
West Champaran	5664	6776	5943	6086	5930	6113	0.06	6241	8202	8476	9484	9706	10577	9971	0.16	0.24
C.V.	0.53	0.51	0.56	0.59	0.61	0.66		0.65	0.66	0.67	0.68	0.73	0.7	0.69		

Source: Author's Compilation using data collected from Economic Survey of Bihar and Bihar Planning Commission data on DDP.

Table 4: Ranking of Districts as Per Capita DDP (1999-00 Prices) (in Rs.)

1999-2000	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Change in ranking between 2000 and 2012	Average Ranking	C.V.
Arariya	37	33	37	36	36	36	35	37	32	34	34	30	35	-2	35	0.06
Arwal	35	36	34	37	28	34	33	35	33	35	35	35	34	-1	34	0.06
Aurangabad	17	25	16	20	16	28	26	20	20	29	23	25	18	1	22	0.2
Banka	34	37	36	34	32	25	28	26	30	31	29	37	32	-2	32	0.12
Begusarai	3	3	3	3	4	3	3	3	3	3	4	3	3	0	3	0.11
Bhagalpur	5	7	4	5	3	4	4	4	4	4	3	4	4	-1	4	0.23
Bhojpur	7	8	7	14	11	15	9	11	8	8	8	9	10	3	10	0.25
Buxar	10	15	18	19	19	27	15	17	12	15	18	20	15	5	17	0.24
Darbhanga	25	14	19	24	20	19	19	23	18	20	16	12	19	-6	19	0.19
East Champaran	27	19	35	10	26	23	31	27	35	21	31	29	21	-6	26	0.26
Gaya	11	17	11	15	7	13	11	12	9	12	15	18	13	2	13	0.23
Gopalganj	22	27	23	33	25	30	24	19	17	26	21	19	12	-10	23	0.23
Jamui	31	32	33	35	33	32	36	36	19	27	24	28	25	-6	30	0.16
Jehanabad	21	26	21	26	18	29	21	21	24	19	22	24	17	-4	22	0.15
Kaimur	12	6	12	17	12	22	17	22	21	22	27	22	24	12	18	0.32
Katihar	16	13	10	8	9	8	14	18	13	14	13	13	16	0	13	0.24
Khagaria	18	23	22	21	15	10	7	13	10	13	12	16	14	-4	15	0.32
Kishanganj	24	22	24	28	22	21	23	25	27	24	25	27	28	4	25	0.09
Lakhisarai	15	21	15	12	10	11	8	8	6	7	6	7	7	-8	10	0.42
Madhepura	29	20	27	27	24	24	30	34	29	37	37	36	36	7	30	0.18
Madhubani	33	4	20	4	35	7	34	24	36	30	33	15	33	0	24	0.5
Munger	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2	0
Muzaffarpur	4	9	6	6	6	5	6	5	5	5	5	5	5	1	6	0.21
Nalanda	13	18	14	16	14	17	12	15	14	11	10	11	8	-5	13	0.21
Nawada	30	31	30	30	30	35	32	32	31	32	30	31	30	0	31	0.04
Patna	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0
Purnia	20	16	17	22	17	18	20	28	25	23	19	23	26	6	21	0.17
Rohtash	6	5	5	7	5	6	5	6	7	6	7	6	6	0	6	0.12
Saharsa	8	10	9	9	8	9	10	16	15	17	14	10	11	3	11	0.27
Samastipur	19	12	13	23	27	16	18	10	22	18	17	14	20	1	18	0.26
Saran	32	28	28	25	23	26	22	29	23	28	20	21	23	-9	25	0.14
Sekhpura	23	29	32	29	21	33	25	30	28	25	28	32	29	6	28	0.12
Sheohar	38	38	38	38	38	38	38	38	38	38	38	38	38	0	38	0
Sitamarhi	36	35	31	32	37	37	37	33	37	33	32	33	31	-5	34	0.07
Siwan	28	34	29	31	31	31	27	9	26	16	26	26	22	-6	26	0.25
Supaul	26	30	26	18	34	20	29	31	34	36	36	34	37	11	30	0.19
Vaishali	14	24	25	11	29	14	16	14	16	9	9	8	9	-5	15	0.43
West Champaran	9	11	8	13	13	12	13	7	11	10	11	17	27	18	12	0.39

Source: Author's Compilation using data collected from Economic Survey of Bihar and Bihar Planning Commission data on DDP.

Table 5: Districts as per Change in their ranks between years 2000 and 2012

Categories of Districts	Districts
Good Performer Districts (improvement in ranks)	Gopalganj, Saran, Lakhisarai, Darbhanga, East Champaran, Jamui, Siwan, Nalanda, Sitamarhi, Vaishali, Jehanabad, Khagaria, Araria, Banka, Bhagalpur, Arwal,
Neutral (no change in ranks)	Begusarai, Katihar, Madhubani, Munger, Nawada, Patna, Rohtas, Sheohar
Bad Performer District (deterioration in ranks)	Aurangabad, Muzaffarpur, Samastipur, Gaya, Bhojpur, Saharsa, Kishanganj, Buxar, Purnia, Sekhpura, Madhepura, Supaul, Kaimur, West Champaran.

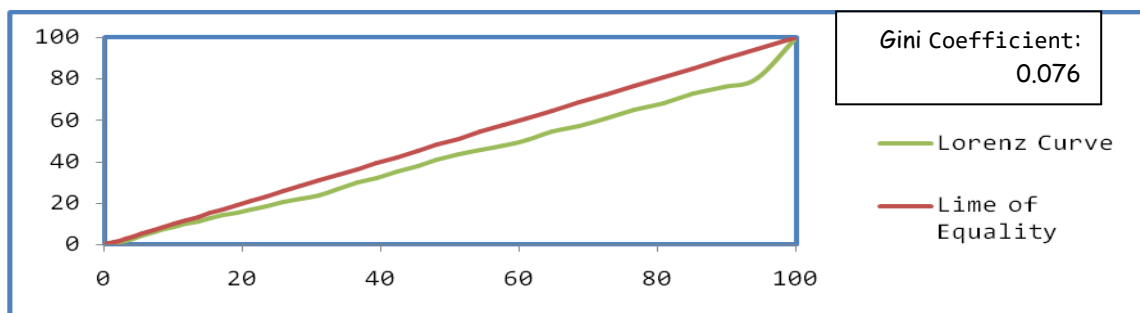
Source: Authors' Compilation using data given in table 4.

Overall, following conclusions can be drawn on the basis of table 3:

i) Comparison of pre 2005 and post 2005 shows that coefficient of variation of per capita income across districts has been on higher side (high volatile) in post 2005 period than the pre 2005 period in Bihar. ii) But, significant change in income of all districts in post 2005 years is the positive side of the post 2005 growth in Bihar. Munger, Gopalganj, Jamui, Siwan, Muzaffarpur, Jehanabad, Patna, Sitamarhi, Vaishali, are better performer districts as growth in these districts income was more volatile and per capita income becomes doubled in post 2005 period. We do not see such changes in case of any districts of Bihar during pre 2005 period (1999 to 2005). Table 4 and table 5 gives detail on rankings of districts on the basis of per capita DDP during 1999-00 to 2011-12. Overall, following conclusions can be drawn on the basis of analysis done in table 4 and table 5: i) Respected ranks of three districts, namely Patna (first), Munger (second) and Sheohar (last) have not changed between 2000 and 2012. ,ii) We see improvement in ranks between 2000 and 2012 (at least one rank improvement) (lower side to higher side) in cases of Gopalganj, Saran, Lakhisarai, Darbhanga, East Champaran, Siwan, Jamui, Nalanda, Vaishali, Sitamarhi, Khagaria, Jehanabad, Banka, Arariya, Bhagalpur, Arwal, Patna. ,iii) We see significant change between 2000 and 2012 (more than 5 ranks improvement) in the ranks of Gopalganj, Saran, Lakhisarai, Darbhanga, East Champaran, Siwan, Jamui., iv) Overall,

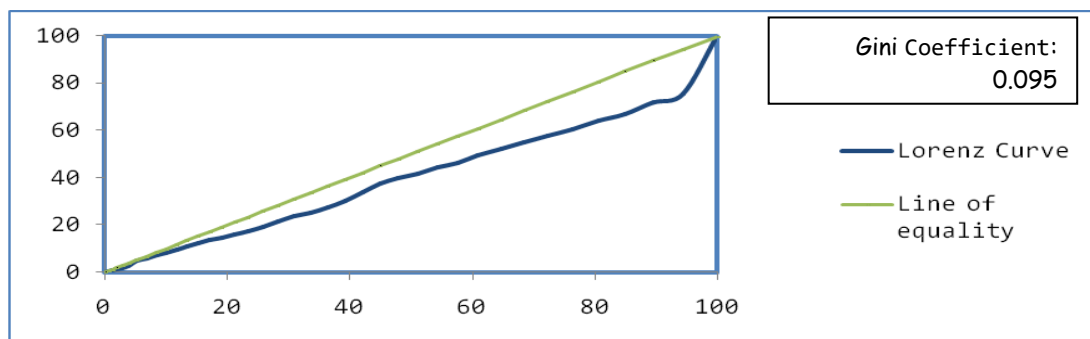
Gopalganj is the best performer across districts of Bihar in terms of improvements of ranks between 2000 and 2012., v) We see decline in ranks between 2000 and 2012 (at least one rank decline) (higher side to lower side) in case of West Champaran, Kaimur, Supaul, Madhepura, Purnia, Sekhpura, Buxar, Kishanganj, Bhojpur, Saharsa, Gaya, Muzaffarpur, Samastipur, Aurangabad. ,v) Overall, West Champaran is the worst performer across districts of Bihar in terms of reduction in value of ranks between 2000 and 2012.

Graph 1: Lorenz Curve for Income Distribution across Districts with reference to their size of Population for the year 2001



Source: Authors' Calculation Based on Data collected from ESB (2006-07) and Census 2001. Note: Y axis shows Cumulative percentage of income and x axis shows cumulative percentage of corresponding population of the concerned district.

Graph 2: Lorenz Curve for Income Distribution across Districts with reference to their size of Population for the year 2012



Source: Authors' Calculation Based on Data collected from ESB (2012-13) and Census 2011. Note: Y axis shows Cumulative percentage of income and x axis shows cumulative percentage of corresponding population of the concerned district.

To analyse the effect of growth across districts on inequality, Lorenz curve has also been drawn and Gini Coefficients have been estimated for two years (2000-01 and 2011-12). This analysis is also important to identify that which period is more inclusive in terms of growth across districts of Bihar. The value of Gini Coefficient for two years (2001 and 2012) is given in Graph 1 and Graph 2. The comparison of value of Gini Coefficient for both the years shows that inequality has increased across districts of Bihar in 2012 than 2001. This shows that growth in income is higher in some districts than other districts of Bihar.

Table 6: Change in Demography and Income Profiles of Districts of Bihar

Districts	Population (lakh and Share in total population of State)				Change in Population	Share in Total Increase in Population of state	Share in Total Change in Per Capita Income
	2001		2011				
Araria	21.6	2.6	28.1	2.7	6.5	3.1	1.7
Arwal	5.9	0.7	7.0	0.7	1.1	0.5	1.9
Aurangabad	20.1	2.4	25.4	2.4	5.3	2.5	2.3
Banka	16.1	1.9	20.3	2.0	4.2	2.0	2.0
Begusarai	23.5	2.8	29.7	2.9	6.2	2.9	3.8
Bhagalpur	24.2	2.9	30.4	2.9	6.2	2.9	4.2
Bhojpur	22.4	2.7	27.3	2.6	4.9	2.3	2.3
Buxar	14.0	1.7	17.1	1.6	3.1	1.5	2.1
Darbhanga	33.0	4.0	39.4	3.8	6.4	3.0	1.8
E. Champaran	39.4	4.7	51.0	4.9	11.6	5.5	2.0
Gaya	34.7	4.2	43.9	4.2	9.2	4.4	2.5
Gopalganj	21.5	2.6	25.6	2.5	4.1	1.9	2.8
Jamui	14.0	1.7	17.6	1.7	3.6	1.7	2.2
Jehanabad	9.2	1.1	11.3	1.1	2.1	1.0	2.4
Kaimur	12.9	1.6	16.3	1.6	3.4	1.6	1.4
Katihar	23.9	2.9	30.7	2.9	6.8	3.2	1.9
Khagaria	12.8	1.5	16.7	1.6	3.9	1.8	2.5
Kishanganj	13.0	1.6	16.9	1.6	3.9	1.8	1.8
Lakhisarai	8.0	1.0	10.0	1.0	2.0	0.9	3.1
Madhepura	15.3	1.8	20.0	1.9	4.7	2.2	1.2
Madhubani	35.8	4.3	44.9	4.3	9.1	4.3	0.9
Munger	11.4	1.4	13.7	1.3	2.3	1.1	5.4
Muzaffarpur	37.5	4.5	48.0	4.6	10.5	5.0	3.5
Nalanda	23.7	2.9	28.8	2.8	5.1	2.4	2.8
Nawada	18.1	2.2	22.2	2.1	4.1	1.9	2.0
Patna	47.2	5.7	58.4	5.6	11.2	5.3	15.8
Purnea	25.4	3.1	32.6	3.1	7.2	3.4	1.7
Rohtas	25	3.0	29.6	2.8	5.1	2.4	2.8
Saharsa	15.1	1.8	19.0	1.8	3.9	1.8	2.2
Samastipur	33.9	4.1	42.6	4.1	8.7	4.1	1.7
Saran	32.5	3.9	39.5	3.8	7.0	3.3	2.3
Sheikhpura	5.3	0.6	6	0.6	1.1	0.5	1.9
Sheohar	5.2	0.6	6.6	0.6	1.4	0.7	1.1
Sitamarhi	26.8	3.2	34	3.3	7.4	3.5	2.0
Siwan	27.1	3.3	33.3	3.2	6.2	2.9	2.5
Supaul	17	2.1	22.3	2.1	5.0	2.4	1.5
Vaishali	27.2	3.3	35.0	3.4	7.8	3.7	2.9
W. Champaran	30.4	3.7	39.4	3.8	9.0	4.3	1.3

Source: Authors' Compilation using Table 3, Census 2001, and Census 2011.

Bihar is the second most populated states of India. Here, an analysis is also essential to see the relationship between change in population and change in income in Bihar, that whether highly populated districts (district with high population growth) are experiencing high income growth or not. Positive and significant (at .1 level of significance) correlation between share in total increase in population of districts and share in total change in per capita income shows that, per capita income and population have grown in similar direction between 2001 and 2011 across districts of Bihar. But, the value of correlation coefficient is not very high. It reveals that the pace of change in income and change in population are not similar in all districts of Bihar. In districts such as, Munger, Sheikhpura, Arwal, Lakhisarai, Patna, Jehanabad, Sheohar, Gopalganj, Buxar, Bhagalpur, Khagaria, Jamui, Begusarai, Saharsa, Rohtas, Nalanda, Nawada per capita income have grown higher than population growth in Bihar (see Table 6).

Labour force participation in Bihar: A District-Level Analysis

The analysis is done to see “how, growth is affecting employment in different districts of Bihar”. Here, an analysis at district level is done to identify that what are main correlates of workforce participation (WPR) at district level (as given in Table 7) in Bihar. An important change that is taking place in Bihar can be seen in terms of improvement in access to road, urbanization. In what ways road development and urbanisation affect livelihood is an important issue. Due to increasing government expenditure on road construction access to quality road has improved in Bihar. Similarly, in absence of opportunity in rural areas people are shifting towards urban areas in Bihar. After construction of road a new kind of agglomeration can be seen in different districts of Bihar and a number of rural towns have been increasing in Bihar. Such changes have impacts on workforce

participation in the state. “How do road construction and urbanisation impact both rural and urban labour force participation” is become an important issue of discussion. Further, in a male-dominated society (can be seen in NFHS Data in terms of higher preference for male child and comparatively higher mortality in female infants than male infants in Bihar) where women are not treated as the principal earning holders, it becomes essential to identify the determinants of female labour force participation rate. Most of the variables included in this analysis are for the year 2011 and are taken from population census, Economic survey of Bihar and NSS.

The variables considered in the factor analysis include the following: HHS: household size; CHWOM: the proportion of children to women; WFPR: main workforce participation rate; LIT: literacy; SC: percentage of scheduled caste population; OTW: percentage of workers engaged in non-household manufacturing and services; CUL: percentage of the workforce engaged as cultivators; AGLB: percentage of the workforce engaged as agricultural labourers; HHW: percentage of workers in household industries; FMR: female-male ratio in the population; MDPI: Multidimensional poverty situation. In addition to the rural specific variables, we have considered URBN which is the percentage of the population in the urban areas in the district.

Table 8 shows findings of factor analysis. Literacy is has strongest association to the underlying latent variables in Factor 1, with a factor loading of 0.89. Multidimensional poverty situation, household size, children per women population, percentage of agriculture workers in total workers, and percentage of Scheduled Castes households in total households are also associated with factor 1. Findings of factor analysis go mostly against the view that urbanization would raise the work participation rate (factor 1 from Table 8).

Table 7: Workers Population Ratio (Main Workers) 2011

Name	WPR	WPR(Male)	WPR(Female)	WPR Gap(Male-Female)
Nalanda	25.75	36.47	14.13	22.34
Jamui	25.30	33.65	16.24	17.42
Araria	24.77	36.71	11.81	24.89
Madhubani	23.94	35.19	11.79	23.40
Purnia	23.78	35.35	11.22	24.13
Patna	23.49	36.43	9.05	27.37
Sheikhpura	23.26	33.33	12.43	20.90
Arwal	23.01	34.87	10.23	24.64
Gaya	22.93	32.40	12.83	19.58
Nawada	22.91	32.84	12.34	20.51
Kishanganj	22.74	38.58	6.06	32.52
Jehanabad	22.37	34.30	9.41	24.89
Purba Champaran	22.21	34.44	8.66	25.79
Madhepura	22.16	31.98	11.37	20.62
Sitamarhi	22.01	35.79	6.68	29.12
Katihar	21.74	34.72	7.61	27.10
Samastipur	21.29	34.60	6.69	27.91
Supaul	21.20	30.84	10.84	20.00
Sheohar	21.00	33.51	6.99	26.52
Vaishali	20.49	33.77	5.64	28.13
Pashchim Champaran	20.27	30.43	9.09	21.35
Lakhisarai	20.17	31.00	8.15	22.85
Begusarai	19.92	31.32	7.18	24.14
Buxar	19.25	31.37	6.11	25.26
Saharsa	19.12	29.78	7.35	22.43
Muzaffarpur	18.96	30.00	6.69	23.30
Aurangabad	18.91	28.99	8.02	20.97
Bhojpur	18.77	30.39	5.96	24.43
Darbhanga	18.57	30.06	5.97	24.09
Banka	18.39	27.68	8.14	19.54
Khagaria	18.37	28.53	6.91	21.62
Rohtas	18.33	30.16	5.43	24.74
Bhagalpur	17.58	27.95	5.80	22.15
Kaimur (Bhabua)	17.50	27.77	6.34	21.43
Munger	17.06	27.29	5.39	21.90
Gopalganj	14.17	23.69	4.85	18.84
Siwan	13.88	23.98	3.65	20.32
Saran	13.80	23.55	3.58	19.97

Source: Author's compilation using Census, 2011.

Table 8: Results from Factor Analysis (District)

Variable/Factor	Factor 1	Factor 2	Factor 3
WPR	-0.21	0.02	0.92
WPRMALE	-0.19	0.05	0.97
WPRFEMALE	-0.16	-0.06	0.61
HHS	0.80	0.04	-0.10
CHWOM	-0.80	-0.26	0.22
SC	0.49	-0.14	0.19
CUL	0.26	-0.47	-0.21
AGLB	-0.60	-0.41	0.48
HHW	0.21	0.08	-0.01
OTW	0.44	0.70	-0.39
LIT	0.89	0.23	-0.21
FMR	0.16	-0.19	-0.13
URBAN	0.27	0.90	0.09
MDPI	-0.82	-0.45	0.29
PCI	0.20	0.86	0.09
Eigen Value	6.18	3.10	2.36
Explained Variation	0.44	0.22	0.17

Note: No. of Observation - 38

R represents rural areas, HHSZ: household size; CHILD-WOM: proportion of children to women; WFPR: main workforce participation rate; LIT: literacy; SC: percentage of scheduled caste population; OTHERACT: percentage of workers engaged in non-household manufacturing and services; CUL: percentage of workforce engaged as cultivators; AGLAB: percentage of work force engaged as agricultural labourers; MFGHH: percentage of workers in household manufacturing; F/M: female-male ratio in the population, BPL: percentage of households below the poverty line; URBAN: percentage of population in the urban areas; AVMPCE: average monthly per capita consumption expenditure; INEQ: inequality in terms of the difference between the minimum and maximum value of the consumption expenditure. The variables are for 2011 or 2011-12 or 2010-11.

Source: Author's calculations.

It was expected that the male work participation rate should be positively related to urbanization but, it is not present in case of Bihar. The situation of Bihar is also different from others states as it has lowest urbanisation in comparison to other states of India. Thus, negative relationship between urbanisation and work

participation rates is a serious phenomenon. The analysis also present emerging phenomena of Bihar that the factor loading of the male work participation rate is higher than female work participation in factor 1.

However, in factor 2 and factor 3 there it has a negative association with the level of urbanization. The male and female participation rates indicate a negative association in both factor 1 and factor 2, which is a reflection on the substitutability between the male and the female workers. Female workers seem to be employed only when male workers are not available. On the other hand, the presence of male workers tends to reduce the absorption of female workers.

Multidimensional poverty and worker participation (total, male, female) in the labour market are positively associated while growth reduces poverty and female work participation, both. Again, cultivation raises women's work participation while other non-farm activities reduce it. This tends to suggest that in agriculture-dependent households there is a need for women and men, both to contribute in terms of their labour while the rural non-farm activities are not productive enough to attract workers sizeably or these activities are not geared to absorbing workers on a large scale. Rise in rural female-male ratio is not reducing women's work participation rate which is in fact quite as per the accepted views. On the other hand, a higher child-woman ratio raises the work participation implying that women and men from households with more children are rather forced to join the labour market in order to meet the minimum consumption requirements. These contrasting findings emerging from factor 1 and factor 3 can be rationalized on the ground that what factor 1 reveals is a much stronger and largely noticed the phenomenon. But at the same time, the findings from factor 3 reveal

that certain new features at par with theoretical underpinnings are emerging simultaneously though not so prevalently.

Imperatives

Analysis done in this study shows that overall development of state is more in favour of male workers than their counterpart. Second, state has achieved double digit growth rate after 2005, but more majority of districts are lagging behind the Patna, District (Capital of the state). Thus, it can be concluded that vertical and horizontal inequality between districts has increased, especially in terms of income after 2005 in Bihar.

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