

# AGRICULTURE AND THE ECONOMY OF BIHAR: AN ANALYSIS

Md. Abdus Salam\*, Md. Ejaz Anwer† and Md. Safdar Alam‡

**Abstract-** The state of Bihar was reorganised on November 15, 2000 with 38 districts, 9 divisions, 101 sub-divisions, 533 blocks and 45,098 villages (Census, 2001). Bihar is the third most populous state and 12<sup>th</sup> largest state in terms of geographical area of about 94.2 thousand square kilometres (Census, 2001). It is divided by river Ganges into two parts i.e., (I) North Bihar with an area of 53.3 thousand sq. kms and (II) South Bihar with an area of 40.9 thousand sq. kms. After the bifurcation of the state, agriculture has become more important because all the rich mineral resources have gone to the state of Jharkhand. The state is left with residual natural resource endowment such as; cultivable land, fertile soil and abundant water. Due to this the economy of Bihar is mainly based on agricultural and allied sectors. After the bifurcation of Bihar, the growth rate in terms of both GSDP and NSDP showed remarkable increase in almost all sub-sectors as compared to pre-bifurcation period. However, agriculture and allied sector has accounted miserable growth rate as compared to industrial and services sector. The share of agriculture and allied sector has declined from 46.70 percent to 26.51 percent during 1990-91 to 2008-09. Despite sharp decline of its share in NSDP, agriculture still plays a vital role in the development of Bihar. The urgent need of the hour is to increase Investments in rural infrastructure for water management/soil conservation/ construction of roads to link rural area with urban area etc. With appropriate technology, infrastructure and policy support, it is possible to reverse the declining trend in food grain production and check the migration of the people from Bihar to other states.

## Basic Features of the Economy of Bihar

The state of Bihar was reorganised on November 15, 2000 with 38 districts, 9 divisions, 101 sub-divisions, 533 blocks and 45,098 villages (Census, 2001)<sup>1</sup>. Bihar is the third most populous state and 12<sup>th</sup> largest state in terms of geographical area of about 94.2 thousand square kilometers (Census, 2001). It is divided by river Ganges into two parts i.e., (I) North Bihar with an area of 53.3 thousand sq. kms and (II) South Bihar with an area of 40.9 thousand sq. kms. After the bifurcation of the state, agriculture has become more important because all the rich mineral resources have gone to the state of Jharkhand. The state is left with residual natural resource endowment such as; cultivable land, fertile soil and abundant water. Due to this the economy of Bihar is mainly based on agricultural and allied sectors. Therefore, the proper economic development of the Bihar's economy is not possible without the growth of agriculture and allied sectors. The agriculture sector holds the key of the state's economy by contributing more than one-fourth (26.51 percent) to GDP (at 1999 constant price) in 2008-09 (CSO, 2009)<sup>2</sup> and providing employment to 81 percent of workforce in the state (GoI, 2008)<sup>3</sup>. It also assumes great importance because near about 90 percent of the population of the state living in rural areas are directly or indirectly depend on agriculture and allied activities for their livelihood. Bihar is the third largest producer of vegetables and 7<sup>th</sup> largest producer of fruits in the country (GoI, 2009)<sup>4</sup>. The gross cropped area (GCA) in Bihar is 79.57 lakh hectares. The net

\* Associate Professor, Deptt. of Economics, AMU, Aligarh, Salam9@gmail.com

† Research Associate, NCAP, New Delhi

‡ Research Scholar, Deptt of Economics, AMU, Aligarh

sown area comprises of 57.25 lakh hectares (GoI, 2008)<sup>5</sup>. The state has several rivers such as Ganga, Sone, Bagmati, Kosi, Budhi Gandak, Punpun, etc. Statistics reveal that about 41 percent of cultivated area is flood-prone and another forty percent is drought-prone.

As the state is endowed with appropriate climatic conditions for the cultivation of a wide range of crops and trees. Based on soil characteristics, rainfall, temperature and terrain, three main Agricultural Climatic Zone (Agro-Climatic Zones) in Bihar have been identified (GoB, 2009)<sup>6</sup>. These are:

*Zone-I: (North Alluvial Plain):* It includes the districts of West Champaran, East-Champaran, Gopalganj, Siwan, Saran, Sitamarhi, Muzaffarpur, Madhubani, Darbhanga, Samastipur, Sheohar, Begusarai and Vaishali. The Zone receives an annual rainfall of about 1040-1450 mm. The soil is mostly sandy loam and loam.

*Zone-II: (North-East Alluvial Plain):* It includes eight districts which are Saharsa, Purnea, Katihar, Supaul, Khagaria, Madhepura, Kishanganj, and Araria. The annual rainfall in this Zone ranges between 1200-1700 mm. The soil is mostly sandy loam and clay loam.

*Zone-III: (South Zone Alluvial Plain):* This covers the largest area comprising 17 districts. It is generally divided into two sub-Zones, which are the eastern and western parts. This Zone receives about 990-1240 mm of annual rainfall and has a variety of soils-sandy loam, clay loam, loam and clay.

*Zone-III (A): (East-South Alluvial Plain):* It comprises, Sheikhpura, Lakhisarai, Jamui, Munger, Bhagalpur and Banka.

*Zone-III (B): (West-South Alluvial Plain):* The districts like Patna, Nalanda, Gaya, Aurangabad, Nawadah, Jehanabad, Arwal, Bhojpur, Buxar, Rohtas and Bhabhua are included in this Zone.

From Table-1, it can be observed that each Zone has its unique agricultural characteristics due to differential climatic factor leading to wide range of socio-economic diversities. Agriculture is the main occupation of the state and because of this state is predominantly rural. Data shows that about 89.50 percent of the population is living in rural areas for their livelihood against 74.30 per cent for the country as a whole. The literate people in the state accounted for 47.53 percent of the total population, with 59.68 percent and 33.12 percent being the male and female respectively (Census, 2001; GoB, 2003<sup>7</sup>). The 61<sup>st</sup> NSSO round reveals that with regard to both total number of poor, Bihar stands the second in the country. About 41.4 per cent of the population is still living below poverty line in the state, as compared to only 27.5 percent at all-India level (GoI, 2009)<sup>8</sup>.

**Table-1: Important Features of Agro-Climatic Zones of Bihar**

Zones	Districts	Area in (M. Ha)			Soil	Ph	Initiation/ Cessation of rainfall	Total rainfall (mm)	Temperature (Degree Celsius)		Main Cropping Systems
		Total Area	NSA#	Irrigated					Max	Min	
<b>Zone-1</b>	West and East Champaran, Gopal ganj, Saran, Siwan, Sitamarhi, Muzaffarpur, Darbhanga, Vaishali, Samastipur, Sheohar, Madhubani, Begusarai	3.26	2.15 (65.95)*	0.86 (40.00)**	Sandy Loam, Loam	6.5 - 8.4	12 <sup>th</sup> June/30 <sup>th</sup> Sep to 10 <sup>th</sup> Oct	1040- 1450 (1245)	36.6	7.7	Rice-Wheat, Maize-Wheat, Maize- Arhar, Maize-Potato-Moong, Maize- Sweet Potato-Moong, Maize- Mustard-Moong, Rice-Potato-Maize, Rice-Sugarcane
<b>Zone-2</b>	Purnea, Katihar Madhepura, Saharsa Araria, Kishanganj Supaul, Khagaria,	2.08	1.21 (58.17)	0.24 (19.83)	Sandy Loam, Clay Loam	6.8 - 7.8	7 <sup>th</sup> June/30 <sup>th</sup> Sep to 10 <sup>th</sup> Oct	1200- 1700 (1450)	33.8	8.8	Jute-Rice, Jute-Wheat, Jute-Rice- Wheat, Jute-Rice-Wheat, Jute-Potato, Jute-Khalai-Wheat, Jute-Rice-Wheat, Jute-Potato, Jute-Khalai-Wheat, Jute-Mustard, Jute-Pea, Rice-Wheat- Moong
<b>Zone-3 (A)</b>	Banka, Munger, Jamui Lakhisarai, Shekhpura Bhagalpur	1.11	0.49 (44.14)	0.21 (42.86)	Sandy Loam, Clay Loam, Clay	6.8 - 8.0	15 <sup>th</sup> June/30 <sup>th</sup> Sep to 10 <sup>th</sup> Oct	990-1240 (1115)	37.1	7.8	Rice-Wheat, Rice-Wheat-Moong, Rice-Gram-Rice, Rice-Potato-Onion, Rice-Rai-Moong, Rice-Bar seem, Rice-Wheat-Moong, Rice-Wheat, Rice-Gram-Rice, Rice-Gram-Moong Rice-Gram-Moong, Rice-Wheat
<b>Zone-3 (B)</b>	Patna, Gaya, Jahanabad Nawada, Nalanda, Rohatas, Bhojpur, Aurangabad, Buxar, Kaimur, Arwal	2.92	1.68 (57.53)	1.37 (81.15)			10 <sup>th</sup> June/ 30 <sup>th</sup> Sep to 10 <sup>th</sup> Oct				
<b>Total</b>	Bihar	9.37	5.53 (59.02)	2.68 (48.46)							

Source: Data based on compiled from ministry of agriculture, Government of Bihar

Note: \* Figures in parenthesis are % to geographical area.\*\* Figures in parenthesis are % to net area sown. # NSA: Net sown Area

**Figure-1: Agro-Climatic Zone-wise Map of Bihar**

Source: www.krishi.bih.nic.in

The state is the poorest by all the means of socio-economic indicators (Table-2). A large group of landless labour from rural areas of the state migrates to other states like Punjab, Delhi, Mumbai and even in some parts of U. P in the sowing and harvesting seasons for their livelihood.

**Table-2: Basic Features of the Economy of Bihar**

Description	Bihar	India
Total Geographical Area, (Sq. Kms.) Census, 2001	94163	3287240
Population Density (2001)	880	324
Sex Ratio (Number of Female Per Thousand of Male) (2001)	921	933
Decadal Growth of Population (1991-2001)	28.4	21.3
Total Population in Millions (2001)	83.0	1028.7
Total Rural Population (in Millions) (2001)	74.3	742.5
Total Urban Population (in Millions) (2001)	8.7	286.1
Total Male Population (2001)	43.2	532.2
Total Female Population (2001)	39.8	496.5
Percentage of Urban Population (2001)	10.5	27.8
Percentage of Rural Population (2001)	89.5	72.2
Total Literacy Rate (2001)	47.5	64.8
Total Rural Literacy Rate (2001)	43.9	58.7
Total Urban Literacy Rate (2001)	71.9	79.9
Total Male Literacy Rate (2001)	33.1	53.7
Total Female Literacy Rate (2001)	33.1	53.7
Rural Female Literacy Rate (2001)	29.6	46.1
Total Poverty Ratio (NSSO-61 <sup>st</sup> Round, 2004-05)	41.4	27.5
Total Rural Poverty Ratio (2004-05)	42.1	28.3
Agriculture Worker as Percentage of Total (Main + Marginal Worker) (2001)	74.6	58.4
Agriculture Worker as Percentage of Total Rural Worker (2001)	81.3	73.3
Work Participation Rate (2001)	33.9	39.3

Source: Census of India, 1991 & 2001 and NSSO, Government of India, New Delhi.

The state is also frequently affected by the two sets of natural disasters like; flood and drought. Occurrence of the two consecutive natural disasters in form of tough drought and severe flood brought setback to agriculture. In 2007, the entire north Bihar was hit by the severe flood; consequently, the loss of cropped area was 16.63 lakh hectares in the state of Bihar (GoB, 2008)<sup>9</sup>. The state also suffers from very poor investment (public and private) in agriculture, as compared to the other states as well as major eastern states of the country. Consequently, the agriculture in Bihar has low productivity with lower cropping intensity among the major eastern states of India.

### **Growth and Pattern of Major Agriculture Crops**

In this Section of this paper an attempt has been made to analyze the growth and pattern in area, production and yield of food grains vis-à-vis non-food grain crops in Bihar over the period from 1990-91 to 2007-08 along with the agro-climatic Zones of Bihar for the period from 1999-00 to 2006. Cropping pattern is the reflection of the family needs and the market demands in an area with the viewpoint of wheat has been the most profitable in the past. The needs and opportunities changes over time with change in technology, market demand and degree of openness of the economy. Cropping pattern being practiced by farmers depends on the quality of land, irrigation facilities, and other agro-climatic and socio-economic conditions of the area. Expansion in cultivable area is the determinant of growth in the production of food grains. The gross and net sown area in the state is estimated at 79.57 and 57.25 lakh hectares respectively with the cropping intensity of 1.38 percent (GoI, 2008)<sup>10</sup>. Both the cultivable area and production of food grains show increasing trends during pre-bifurcation period i.e. 1990-91 to 1999-2000. In terms of annual growth rate, both in area and production of food grains declined significantly during post-bifurcation period. It is evident that there is no scope for further increase in the cultivable area under food grains. Thus, increasing the yield and cropping intensity are the best options for accelerating the growth of agricultural production in the state. It can be observed from the Table-3 that the CAGR of area under food grains has significantly decreased from 3.14 percent per annum in pre-bifurcation period to 2.70 percent per annum in post-bifurcation period. It is due to decrease in area under almost all cereals, coarse cereals and pulses. The area under non-food grains registered miserable growth; it increased from 1.03 percent per annum to 1.11 percent per annum during the pre and post-bifurcation period respectively. This is because of the decrease in the area under oilseeds, jute, mesta, fruits, sugarcane and jute. It is important to

highlight that the area under food grains still occupies more than 86 percent of total cropped area due to the traditional cropping pattern as well as traditional food habits. The crop-wise analysis of the data reveals that among the cereal crops, rice is one of the most widely cultivated crops in Bihar. However, the area under rice is constantly declining over the period but stood first in all the three comparative years at 3684 thousand hectares (Tha) in 1991-92, 3657 Tha and 3573 Tha in 2001 and 2007-08 respectively. The area under wheat shows ever-increasing trends and holds the second foremost growing crops in all the comparative years in Bihar. Thus, the area under wheat grew up by 1925 Tha to 2067 Tha and further to 2163 Tha. The area under coarse cereals, oilseeds and pulses demonstrate a declining trend in the year 2007-08 as compared to 2000-01.

**Table-3: CAGR (Based on Dummy Technique) of Area, Production and Yield of Major Crops of Bihar (1991-92 to 2007-08)**

Region	Crops	Year			CAGR		
		1991-92	2000-01	2007-08	Pre	Post	Over-all
Area (In '000 Hectare)	Food grains	7408 (84.5)	9883.2 (87.5)	9876 (86.3)	3.14**	2.70*	2.57*
	Non-Food grains	1359.5 (15.5)	1410 (12.5)	1570.8 (13.7)	1.03***	1.11*	1.13*
Production (In '000 MT)	Food grains	9192 (31.4)	12066 (38.9)	11770 (34.0)	6.46*	1.65***	0.27
	Non-Food grains	20107 (68.6)	18969 (61.1)	22797 (66.0)	-1.74	-0.53	-0.17
Yield (Kg/Hectare)	Food grains	1241 (7.7)	1221 (8.3)	1192 (7.6)	3.22**	-1.02	-2.24**
	Non-Food grains	14790 (92.3)	13453 (91.7)	14513 (92.4)	-2.74***	-1.62**	-1.28***

Source: Based on Data Compiled and Computed from Ministry of Agriculture, Govt. of Bihar, Indiatat.com, CMIE, Agriculture, various issues.

Figure in parenthesis is percentages share of total area, production and yield of food grains and non-food grains

Note: For Calculation, See Appendix-2 (A, B and C).

Where: \*, \*\* and \*\*\* are the 1 percent, 5 percent and 10 percent level of significance respectively.

# CAGR percent: Pre-Bifurcation period from 1991-92 to 1999-00 and Post-Bifurcation period: 2000-01 to 2007-08.

Note: Figure in parenthesis are the percentages share of area, production and Yield of food grains and non-food grains to the total agriculture (selected major crops), Food grains include: total cereals, total coarse cereals and pulses, and Non-food grains comprises rapeseeds and mustard, linseeds, groundnuts, jute, measta, sugarcane, fruits and vegetables. While, area in thousand hectares (Tha), Production in thousands metric tonnes (TMT) and Yield TMT/Tha.

Missing data of area and Production has been interpolated and extrapolated as per the nature of the data for crops like: Small Millets for the year, 1991-92, sesamum by  $Y = a+bt$  formula, while; Area and Production of vegetables has been interpolated for the year 1993-94 and 1994-95 and computed by  $Y = a+bt+ct^2$  formula, and further more small millets for the year 1993-94, 1995-96, 1997-98 and 2000-01 and gram for 1999-2000, Measta for 1992-93, 1993-94 has been interpolated by  $Y_t = Y_o(1+r)^t$ .



The area under vegetables increased drastically from 577 Tha in 1991-92 to 708 Tha in 2000-01 and further to 824 Tha in 2007-08. While the area under fruits shows a miserable increasing trend. The area under fruits grew from 267 Tha to 268 Tha and further to 286 Tha during the same period. Similarly area under total commercial crops namely; groundnuts and sugarcane has shown remarkable increase during 2007-08 as against the earlier period 2000-01. Finally, it can be observed from the data that Bihar has, to some extent, diversified in favour of horticulture and commercial crops during the over-all period. The change in cropping pattern in the state between pre and post-bifurcation period indicates significant shift from food grains to non-food grains like fruits and vegetables, fibers, etc., especially from coarse cereals (jowar, barley, ragi and small millets) and pulses to groundnuts, sugarcane, fibers and vegetables. Therefore, it can be said that Bihar has diversified in favour of horticulture and commercial crops, but it registered a growth rate of 1.11 per cent per annum which is significance at 1 percent level of significance in the post-bifurcation period in Bihar (Table-3). The SID value also supports that, the diversification in favour of horticulture crops in Bihar has increased from 0.788 in 1990-91 to 0.820 in 2005-06. Thus, the hypothesis that cultivation area has not shifted from traditional crops to horticultural and commercial crops in Bihar is rejected.

### **Area, Production and Yield of Food grains (Rice and Wheat)**

Table-4 reveals that during 1999-00, highest area of 12.13 lakh hectares (Lha) has been accounted under aghani rice in Zone-3(B) while lowest area of 1.91 Lha under same crop has been recorded in Zone-3(A). In case of summer rice highest area of 1.02 Lha has been recorded in Zone-2, only 0.01 Lha area in both Zone-3(A) and Zone-3(B). Highest area of 4.06 Lha under bhadaï rice has been accounted in Zone-1 while only 0.01 Lha in Zone-3(A). Highest (9.15 Lha) and lowest (1.58 Lha) area under wheat cultivation has been recorded in Zone-1 and Zone-3(A) respectively. Area under the aghani rice in Zone-3(B) remains continuously highest till 2005-06 in Bihar, whereas Zone-3(A) has recorded continuously lowest in each year till 2005-06. The area under bhadaï (autumn) rice recorded highest in Zone-1 and lowest area in

Zone-3(A) in each year. Like bhadaï rice, area under wheat cultivation recorded highest and lowest in Zone-1 and Zone-3(A) respectively in each year. Like area, production of aghani rice has recorded highest and lowest in Zone-3(B) and Zone-3(A) respectively in each year. Again the highest production of summer rice has been recorded in Zone-2 throughout the entire study time. Zone-1 has recorded the highest production of bhadaï rice in each year. It is observed that the Zone-1 has recorded highest production of wheat till 2002-2003 while during 2003-2004 highest production of 14.83 lakh metric tonnes (LMT) has been recorded in Zone-3(B) but in 2004-05 and 2005-06 Zone-1 has produced highest amount of wheat. Again, in case of yield of aghani rice Zone-3(B) has recorded highest in each year except in 2004-05 when highest yield of 1.02 metric tonnes per hectare (MT/Ha) has been recorded in Zone-3(A). The yield of summer rice has been recorded highest 1.75 MT/Ha in Zone-2 in each year except in 2002-03. Highest yield of bhadaï rice has been found in different Zones in different years, i.e., 1.41 MT/Ha, 1.34 MT/Ha and 1.27 MT/Ha in Zone-1 during 1999-00, 2001-02 and 2003-04 respectively; 1.35 MT/Ha, 1.01 MT/Ha and 1.01 MT/Ha in Zone-2 during 2000-01, 2004-05 and 2005-06 respectively; while 1.17 MT/Ha in Zone-3(B) during 2002-03. A noticeable Figure is observed that the highest Figure of the total production and yield of wheat have been observed in different Zones in each year. During 1999-00 to 2002-03 and 2005-06 highest yield has been recorded in Zone-3(B).



**Table-4: Agro-Climatic Zone-wise Area, Production and Yield of Different Food Crops Since 1999-00 to 2005-06 in Bihar**

Crops	Agro Climatic Zones	Area in lakh Hectares (Lha)							Production (in lakh Metric Tonnes (LMT))							Yield (Production lakh MT/Area lakh Hectares)						
		1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Aghani Rice	Zone-1	8.93	9.12	8.89	9.06	9.03	8.72	8.77	12.36	12.08	14.38	10.1	10.5	5.19	6.76	1.38	1.32	1.62	1.11	1.16	0.6	0.77
	Zone-2	6.34	5.57	5.63	5.54	5.56	5.29	5.26	7.58	6.29	5.37	6.05	7.71	4.1	5.07	1.2	1.13	0.95	1.09	1.39	0.78	0.96
	Zone-3 (A)	1.91	3.01	2.53	2.88	2.83	2.47	2.61	2.52	3.64	3.22	3.99	3.85	2.53	2.83	1.32	1.21	1.27	1.38	1.36	1.02	1.09
	Zone-3 (B)	12.13	11.71	11.58	11.33	11.65	9.11	9.42	23.56	22.37	23.53	21.91	23.83	5.25	15.57	1.94	1.91	2.03	1.93	2.04	0.58	1.65
	All Bihar	29.3	29.4	28.64	28.81	29.07	25.6	26.05	46.02	44.38	46.49	42.05	45.9	17.07	30.23	1.57	1.51	1.62	1.46	1.58	0.67	1.16
Summer Rice	Zone-1	0.22	0.2	0.19	0.22	0.2	0.2	0.19	0.31	0.34	0.36	0.38	0.24	0.21	0.18	1.39	1.71	1.88	1.72	1.23	1.06	0.96
	Zone-2	1.02	1.04	0.95	0.99	0.96	0.93	0.94	2.14	1.76	1.84	1.59	1.44	1.38	1.64	2.11	1.7	1.94	1.61	1.5	1.49	1.75
	Zone-3 (A)	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0	0.01	0	0.01	1.86	1.63	1.84	0.26	1.4	1.34	1.36
	Zone-3 (B)	0.01	0.01	0.01	0.01	0	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1.83	1.56	1.91	1.52	1.41	1.23	1.47
	All Bihar	1.25	1.25	1.15	1.21	1.17	1.14	1.13	2.47	2.13	2.22	1.97	1.7	1.62	1.83	1.98	1.7	1.93	1.62	1.45	1.42	1.61
Bhadai (Autumn) Rice	Zone-1	4.06	4.33	4.49	4.41	4.14	4.21	3.97	5.72	5.72	6.02	4.8	5.28	3.72	3.59	1.41	1.32	1.34	1.09	1.27	0.88	0.9
	Zone-2	1.31	1.55	1.39	1.19	1.35	1.3	1.37	1.22	2.1	1.3	1.19	1.55	1.31	1.38	0.93	1.35	0.93	1	1.14	1.01	1.01
	Zone-3 (A)	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	1.15	1.27	1.24	1.08	1.23	0.91	0.91
	Zone-3 (B)	0.03	0.02	0.07	0.02	0.03	0.02	0.04	0.03	0.03	0.08	0.02	0.04	0.02	0.04	1.16	1.3	1.23	1.17	1.24	0.91	1
	All Bihar	5.41	5.92	5.97	5.63	5.54	5.53	5.39	6.98	7.87	7.42	6.03	6.88	5.06	5.02	1.29	1.33	1.24	1.07	1.24	0.91	0.93
Wheat	Zone-1	9.15	9.04	9.27	9.19	8.92	9.07	9.13	20.07	19.78	18.5	16.51	14.72	16	12.02	2.19	2.19	2	1.8	1.65	1.76	1.32
	Zone-2	3.47	3.62	3.9	3.82	3.67	3.52	3.42	7.14	7.43	6.76	6.11	4.6	4.82	2.82	2.06	2.05	1.73	1.6	1.25	1.37	0.83
	Zone-3 (A)	1.58	1.65	1.5	1.48	1.57	1.49	1.35	2.66	2.86	2.49	2.31	2.73	2.03	1.82	1.68	1.73	1.66	1.56	1.74	1.37	1.35
	Zone-3 (B)	6.61	6.36	6.6	6.82	6.61	6.2	6.12	15.96	14.1	16.19	15.42	14.83	9.78	11.12	2.41	2.22	2.45	2.26	2.25	1.58	1.82
	All Bihar	20.81	20.67	21.26	21.3	20.77	20.28	20.02	45.84	44.17	43.93	40.36	36.89	32.63	27.78	2.2	2.14	2.07	1.89	1.78	1.61	1.39

Source: <http://krishi.bih.nic.in>

Note: Where all districts of Bihar are under these agricultural Zones, which are as follows;

Zone-1: W. Champaran, East Champaran, Gopalganj, Siwan, Saran, Sitamarhi, Muzaffarpur, Madhubani, Darbhanga, Samastipur, Sheohar, Begusarai, Vaishali

Zone-2: Saharsha, Purina, Katihar, Supaul, Khagaria, Madhepura, Kishanganj, Araria

Zone-3 (a): Bhagalpur, Sheikhpura, Lakhisarai, Jamui, Munger, Banka

Zone-3 (b): Bhabua, Rohtas, Aurangabad, Buxar, Jahanabad (Arval is included in this dist.), Gaya, Nalanda, Nawada, Patna

**Table-4: Agro-Climatic Zone-wise Area, Production and Yield of Different Food Crops Since 1999-00 to 2005-06 in Bihar**

Crops	Agro Climatic Zones	Area in lakh Hectares (Lha)							Production (in lakh Metric Tonnes (LMT))							Yield (Production lakh MT/Area lakh Hectares)						
		1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Aghani Rice	Zone-1	8.93	9.12	8.89	9.06	9.03	8.72	8.77	12.36	12.08	14.38	10.1	10.5	5.19	6.76	1.38	1.32	1.62	1.11	1.16	0.6	0.77
	Zone-2	6.34	5.57	5.63	5.54	5.56	5.29	5.26	7.58	6.29	5.37	6.05	7.71	4.1	5.07	1.2	1.13	0.95	1.09	1.39	0.78	0.96
	Zone-3 (A)	1.91	3.01	2.53	2.88	2.83	2.47	2.61	2.52	3.64	3.22	3.99	3.85	2.53	2.83	1.32	1.21	1.27	1.38	1.36	1.02	1.09
	Zone-3 (B)	12.13	11.71	11.58	11.33	11.65	9.11	9.42	23.56	22.37	23.53	21.91	23.83	5.25	15.57	1.94	1.91	2.03	1.93	2.04	0.58	1.65
	All Bihar	29.3	29.4	28.64	28.81	29.07	25.6	26.05	46.02	44.38	46.49	42.05	45.9	17.07	30.23	1.57	1.51	1.62	1.46	1.58	0.67	1.16
Summer Rice	Zone-1	0.22	0.2	0.19	0.22	0.2	0.2	0.19	0.31	0.34	0.36	0.38	0.24	0.21	0.18	1.39	1.71	1.88	1.72	1.23	1.06	0.96
	Zone-2	1.02	1.04	0.95	0.99	0.96	0.93	0.94	2.14	1.76	1.84	1.59	1.44	1.38	1.64	2.11	1.7	1.94	1.61	1.5	1.49	1.75
	Zone-3 (A)	0.01	0.01	0.01	0	0	0	0	0.01	0.01	0.01	0	0.01	0	0.01	1.86	1.63	1.84	0.26	1.4	1.34	1.36
	Zone-3 (B)	0.01	0.01	0.01	0.01	0	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1.83	1.56	1.91	1.52	1.41	1.23	1.47
	All Bihar	1.25	1.25	1.15	1.21	1.17	1.14	1.13	2.47	2.13	2.22	1.97	1.7	1.62	1.83	1.98	1.7	1.93	1.62	1.45	1.42	1.61
Bhadai (Autumn) Rice	Zone-1	4.06	4.33	4.49	4.41	4.14	4.21	3.97	5.72	5.72	6.02	4.8	5.28	3.72	3.59	1.41	1.32	1.34	1.09	1.27	0.88	0.9
	Zone-2	1.31	1.55	1.39	1.19	1.35	1.3	1.37	1.22	2.1	1.3	1.19	1.55	1.31	1.38	0.93	1.35	0.93	1	1.14	1.01	1.01
	Zone-3 (A)	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	1.15	1.27	1.24	1.08	1.23	0.91	0.91
	Zone-3 (B)	0.03	0.02	0.07	0.02	0.03	0.02	0.04	0.03	0.03	0.08	0.02	0.04	0.02	0.04	1.16	1.3	1.23	1.17	1.24	0.91	1
	All Bihar	5.41	5.92	5.97	5.63	5.54	5.53	5.39	6.98	7.87	7.42	6.03	6.88	5.06	5.02	1.29	1.33	1.24	1.07	1.24	0.91	0.93
Wheat	Zone-1	9.15	9.04	9.27	9.19	8.92	9.07	9.13	20.07	19.78	18.5	16.51	14.72	16	12.02	2.19	2.19	2	1.8	1.65	1.76	1.32
	Zone-2	3.47	3.62	3.9	3.82	3.67	3.52	3.42	7.14	7.43	6.76	6.11	4.6	4.82	2.82	2.06	2.05	1.73	1.6	1.25	1.37	0.83
	Zone-3 (A)	1.58	1.65	1.5	1.48	1.57	1.49	1.35	2.66	2.86	2.49	2.31	2.73	2.03	1.82	1.68	1.73	1.66	1.56	1.74	1.37	1.35
	Zone-3 (B)	6.61	6.36	6.6	6.82	6.61	6.2	6.12	15.96	14.1	16.19	15.42	14.83	9.78	11.12	2.41	2.22	2.45	2.26	2.25	1.58	1.82
	All Bihar	20.81	20.67	21.26	21.3	20.77	20.28	20.02	45.84	44.17	43.93	40.36	36.89	32.63	27.78	2.2	2.14	2.07	1.89	1.78	1.61	1.39

Source: <http://krishi.bih.nic.in>

Note: Where all districts of Bihar are under these agricultural Zones, which are as follows;

Zone-1: W. Champaran, East Champaran, Gopalganj, Siwan, Saran, Sitamarhi, Muzaffarpur, Madhubani, Darbhanga, Samastipur, Sheohar, Begusarai, Vaishali

Zone-2: Saharsha, Purina, Katihar, Supaul, Khagaria, Madhepura, Kishanganj, Araria

Zone-3 (a): Bhagalpur, Sheikhpura, Lakhisarai, Jamui, Munger, Banka

Zone-3 (b): Bhabua, Rohtas, Aurangabad, Buxar, Jahanabad (Arval is included in this dist.), Gaya, Nalanda, Nawada, Patna

### **Share of Area, Production and Yield of Food grains**

Table-5 shows that the share of area and production of food crops in different agro-climatic Zones in the state. During 1999-2000, Zone-3(B) has recorded as highest as 41.4 percent area under aghani rice and its highest share with fluctuated Figure continued till 2005-06. Zone-3(A) has recorded lowest share of area under aghani rice, i.e. 6.5 percent in 1999-00, 10.2 percent in 2000-01, 8.8 percent in 2001-02, 10.0 percent in 2002-03, 9.7 percent in both 2003-04 and 2004-05 and 10 percent in 2005-06. It can also be observed that summer rice is cultivated mainly in Zone-2 which accounts highest share in each year till 2005-06 in Bihar. While Zone-3(A) and Zone 3(B) are placed at bottom in the share of area under summer rice. In the state, highest share of area under bhadaï rice has been registered in Zone-1: i.e., 75.1 percent, 73.2 percent, 75.2 percent, 78.3 percent, 74.8 percent, 76.0 percent and 73.6 percent in 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 respectively. In case of area under wheat cultivation, highest share has been recorded in Zone-1 followed by Zone-3(B) in each year. While Zone-3(A) shows lowest percentage share of area under wheat in each year, i.e. 7.4 percent, 8.0 percent, 7.9 percent, 7.6 percent, 8.2 percent, 8.3 percent, and 7.5 percent in 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, and 2005-06 respectively. Likewise the highest percentage share of production of aghani rice, summer rice and bhadaï rice has been recorded in Zone-3(B), Zone-2 and Zone-1 respectively. The percentage share of production of aghani rice in Zone-3(B) has been accounted for 51.2 percent, 50.4 percent, 50.6 percent, 52.1 percent, 51.9 percent, 30.7 percent, and 51.5 percent in 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 respectively. Highest percentage share of production of summer rice in Zone-2 is 86.8 percent, 82.75, 82.9 percent, 80.4 percent, 84.9 percent, 85.6 percent and 89.6 percent, while lowest Figure in Zone-3(A) is 0.4 per cent, 0.6 per cent, 0.4 per cent, 0.1 per cent, 0.3 per cent, 0.3 per cent and 0.3 per cent during 1999-00, 2000-01, 2001,02, 2002-03, 2003-04, 2004-05 and 2005-06 respectively. Zone-1 has recorded highest percentage share in production of wheat accounting 43.8 per cent, 44.8 per cent, 42.1 per cent, 40.9 per cent, 39.9 per cent, 49.0 per cent and 43.3 per cent in 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 respectively. Zone-3(A) recorded lowest percentage of 6.2 per cent, 6.9 per cent, 6.2 per cent, 6.1 per cent, 7.9 per cent, 7.6 per cent and 7.8 per cent in 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05 and 2005-06 respectively.

**Table-5: Agro-Climatic Zone-wise Percentage Share of Area, Production of Food grains Since 1999-00 to 2005-06 in Bihar**

Crops	Agro Climatic Zones	Percentage Share in Area							Percentage Share in Productions						
		1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Aghani Rice	Zone-1	30.5	31	31	31.4	31.1	34.1	33.7	26.9	27.2	30.9	24	22.9	30.4	22.4
	Zone-2	21.6	18.9	19.7	19.2	19.1	20.7	20.2	16.5	14.2	11.5	14.4	16.8	24	16.8
	Zone-3 (A)	6.5	10.2	8.8	10	9.7	9.7	10	5.5	8.2	6.9	9.5	8.4	14.8	9.4
	Zone-3 (B)	41.4	39.8	40.5	39.3	40.1	35.6	36.1	51.2	50.4	50.6	52.1	51.9	30.7	51.5
	All Bihar	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Summer Rice	Zone-1	17.6	16.1	16.5	18	17	17.7	16.5	12.4	16.2	16.1	19.1	14.4	13.3	9.8
	Zone-2	81.4	82.7	82.4	81.2	82.3	81	82.9	86.8	82.7	82.9	80.4	84.9	85.6	89.6
	Zone-3 (A)	0.4	0.6	0.5	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.1	0.3	0.3	0.3
	Zone-3 (B)	0.5	0.6	0.6	0.5	0.4	1	0.3	0.5	0.6	0.6	0.4	0.4	0.8	0.3
	All Bihar	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bhadai (Autumn) Rice	Zone-1	75.1	73.2	75.2	78.3	74.8	76	73.6	81.9	72.7	81.1	79.7	76.7	73.5	71.5
	Zone-2	24.2	26.3	23.3	21.1	24.4	23.4	25.4	17.4	26.7	17.5	19.8	22.5	25.9	27.5
	Zone-3 (A)	0.2	0.2	0.4	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.2	0.2	0.3	0.2
	Zone-3 (B)	0.5	0.4	1.1	0.3	0.6	0.3	0.7	0.4	0.4	1.1	0.3	0.6	0.3	0.7
	All Bihar	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Wheat*	Zone-1	44	43.7	43.6	43.1	43	44.7	45.6	43.8	44.8	42.1	40.9	39.9	49	43.3
	Zone-2	16.7	17.5	18.3	17.9	17.7	17.4	17.1	15.6	16.8	15.4	15.1	12.5	14.8	10.1
	Zone-3 (A)	7.4	8.0	7.9	7.6	8.2	8.3	7.5	6.2	6.9	6.2	6.1	7.9	7.6	7.8
	Zone-3 (B)	31.8	30.8	31.1	32.0	31.8	30.6	30.6	34.8	31.9	36.9	38.2	40.2	30.0	40.0
	All Bihar	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Same as Table-4

## **Annual Growth Rate of Area, Production and Yield of Food grains**

Table-6 reveals the percentage change in area of production and yield of rice and wheat in different agro-climatic Zones in Bihar. The Table shows high degree of fluctuations in aghani rice. The highest annual growth of area which is 57.5 percent in Zone-3(A) during 1999-00 to 2000-01, and has recorded highest average annual growth rate of 7.8 percent during the period from 2000-01 to 2005-06. While Zone-3(B) has recorded highest negative average growth rate of -3.7 percent per annum over the same period. This is because of the decline in area under aghani rice by -21.8 percent during 2003-04 to 2004-05. In the cultivation of summer rice, Zone-3(B) registered highest average growth rate of 9.5 percent per annum, while Zone-3(A) registered negative growth rate of -2.8 percent per annum. The total area under the cultivation of bhadaï rice in Bihar has increased by 45.8 percent in Zone-3(B). A noticeable Figure is observed in the growth pattern of area under wheat. Zone-3(A) has registered highest negative average rate of -2.4 percent per annum over the period; because area under wheat has declined by -9.5 percent and -8.9 percent during 2001-02 and 2005-06 in the same Zone. The area under wheat cultivation has declined by -0.6 per cent per annum in Bihar as a whole. A wide fluctuations in the growth rate of yield of aghani rice has been observed. In the year 2000-01, all the Zones of Bihar has recorded negative growth rate, while highest positive growth of 187.3 percent yield in 2005-06 has been recorded in Zone-3(B). Thus, Zone-3(B) registered highest average rate of growth by 20.2 percent per annum among all the Zones of Bihar over the period while Zone-1 has registered lowest as well negative average growth rate of -4.7 percent per annum during the same period.

**Table-6:Zone-wise Annual and Average Annual Growth Rate of Area, Production and Yield of Food Crops in Bihar from 2000-01 to 2005-06**

Crops	Agro Climatic Zones	Growth Rates in Area							Growth Rate in Productions							Growth Rates of Yield						
		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	AAGR	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	AAGR	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	AAGR
Aghani Rice	Zone-1	2.1	-2.5	1.9	-0.4	-3.4	0.6	-0.3	-2.3	19	-29.8	4	-50.6	30.2	-4.92	-4.3	22.1	-31.1	4.4	-48.8	29.5	-4.70
	Zone-2	-12.1	1.1	-1.7	0.4	-4.9	-0.7	-3.0	-17	-14.8	12.8	27.4	-46.8	23.6	-2.47	-5.6	-15.7	14.7	26.8	-44.1	24.4	0.08
	Zone-3 (A)	57.5	-15.8	14	-2	-12.4	5.3	7.8	44.8	-11.7	23.9	-3.3	-34.3	11.8	5.20	-8	4.9	8.7	-1.4	-25	6.1	-2.45
	Zone-3 (B)	-3.5	-1	-2.2	2.9	-21.8	3.3	-3.7	-5	5.2	-6.9	8.7	-78	196.8	20.13	-1.6	6.3	-4.8	5.7	-71.9	187.3	20.17
	<b>All Bihar</b>	<b>0.3</b>	<b>-2.6</b>	<b>0.6</b>	<b>0.9</b>	<b>-12</b>	<b>1.8</b>	<b>-1.8</b>	<b>-3.6</b>	<b>4.7</b>	<b>-9.5</b>	<b>9.1</b>	<b>-62.8</b>	<b>77.1</b>	<b>2.50</b>	<b>-3.9</b>	<b>7.5</b>	<b>-10.1</b>	<b>8.2</b>	<b>-57.8</b>	<b>74</b>	<b>2.98</b>
Summer Rice	Zone-1	-8.3	-5.9	14.8	-9.1	2	-7.8	-2.4	12.7	3.7	5.2	-34.9	-12.3	-16.2	-6.97	22.9	10.2	-8.4	-28.4	-14	-9.1	-4.47
	Zone-2	1.9	-8.7	4.1	-2.4	-3.7	1.4	-1.2	-17.7	4.3	-13.8	-9	-4	18.3	-3.65	-19.2	14.2	-17.2	-6.8	-0.3	16.7	-2.10
	Zone-3 (A)	40.3	-28.3	-24.3	3.6	-14	5.7	-2.8	22.7	-18.8	-89.3	456.9	-17.3	7.2	60.23	-12.5	13.3	-85.9	437.7	-3.8	1.4	58.37
	Zone-3 (B)	22.8	-10.4	-16.3	-25.1	153.4	-67.5	9.5	4.5	9.7	-33.6	-30.4	122.1	-61.4	1.82	-14.9	22.5	-20.7	-7.1	-12.3	18.7	-2.30
	<b>All Bihar</b>	<b>0.4</b>	<b>-8.4</b>	<b>5.7</b>	<b>-3.7</b>	<b>-2.2</b>	<b>-0.9</b>	<b>-1.5</b>	<b>-13.6</b>	<b>4.1</b>	<b>-11.2</b>	<b>-13.8</b>	<b>-4.8</b>	<b>13</b>	<b>-4.38</b>	<b>-14</b>	<b>13.6</b>	<b>-15.9</b>	<b>-10.5</b>	<b>-2.7</b>	<b>14.1</b>	<b>-2.57</b>
Bhadai (Autumn) Rice	Zone-1	6.6	3.7	-1.7	-6.1	1.5	-5.6	-0.3	0	5.2	-20.2	9.9	-29.6	-3.5	-6.37	-6.2	1.4	-18.8	17.1	-30.6	2.2	-5.82
	Zone-2	19	-10.6	-14.3	13.7	-4.3	5.9	1.6	72.7	-38.4	-7.9	29.7	-15.5	5.7	7.72	45.1	-31.1	7.5	14.1	-11.7	-0.2	3.95
	Zone-3 (A)	-2.2	100.9	-42.6	-16.2	41.3	-15.2	11.0	7.8	96.5	-50	-4.5	4.9	-15.3	6.57	10.3	-2.2	-13	13.9	-25.8	-0.1	-2.82
	Zone-3 (B)	-15.7	195.6	-76	102.4	-46.5	114.9	45.8	-5.7	179.6	-77.2	114.4	-60.6	134.5	47.50	11.9	-5.4	-5	6	-26.4	9.1	-1.63
	<b>All Bihar</b>	<b>9.5</b>	<b>0.9</b>	<b>-5.6</b>	<b>-1.6</b>	<b>-0.1</b>	<b>-2.5</b>	<b>0.1</b>	<b>12.7</b>	<b>-5.7</b>	<b>-18.8</b>	<b>14.1</b>	<b>-26.5</b>	<b>-0.7</b>	<b>-4.15</b>	<b>2.9</b>	<b>-6.5</b>	<b>-13.9</b>	<b>16</b>	<b>-26.4</b>	<b>1.8</b>	<b>-4.35</b>
Wheat	Zone-1	-1.3	2.6	-0.9	-2.9	1.7	0.7	0.0	-1.5	-6.5	-10.7	-10.9	8.7	-24.9	-7.63	-0.2	-8.8	-9.9	-8.2	6.9	-25.4	-7.60
	Zone-2	4.5	7.6	-1.9	-3.9	-4.2	-3	-0.2	4.1	-9.1	-9.6	-24.6	4.8	-41.6	-12.67	-0.4	-15.5	-7.9	-21.6	9.3	-39.8	-12.65
	Zone-3 (A)	4.4	-9.5	-1.4	6.1	-5.2	-8.9	-2.4	7.4	-13.2	-7.1	18.2	-25.5	-10.4	-5.10	2.9	-4.1	-5.8	11.4	-21.4	-1.6	-3.10
	Zone-3 (B)	-3.7	3.8	3.3	-3.1	-6.2	-1.3	-1.2	-11.6	14.8	-4.7	-3.8	-34.1	13.7	-4.28	-8.2	10.7	-7.8	-0.7	-29.7	15.2	-3.42
	<b>All Bihar</b>	<b>-0.7</b>	<b>2.9</b>	<b>0.2</b>	<b>-2.5</b>	<b>-2.4</b>	<b>-1.3</b>	<b>-0.6</b>	<b>-3.6</b>	<b>-0.6</b>	<b>-8.1</b>	<b>-8.6</b>	<b>-11.5</b>	<b>-14.9</b>	<b>-7.88</b>	<b>-3</b>	<b>-3.3</b>	<b>-8.3</b>	<b>-6.2</b>	<b>-9.4</b>	<b>-13.8</b>	<b>-7.33</b>

Source: Same as Table-4

Note: AAGR: Average Annual Growth Rate



The state shows poor performance in the yield of summer rice. It registered a growth rate of -14.0 percent in 2000-01, -15.9 percent in 2002-03, -10.5 percent in 2003-04 and -2.7 percent in 2004-05, however it increased by 13.6 percent in 2001-02 and 14.11 percent in 2005-06. In 2004-05, all the Zones have recorded negative growth in yield of summer rice, but a highest growth, i.e., 434.7 percent has been recorded in 2003-04 in Zone-3(A). The state shows a positive growth in yield of bhadai rice of 2.9 percent in 2000-01, 16.0 percent in 2003-04 and 1.8 percent in 2005-06, but a negative growth of -6.5 percent in 2001-02, -13.9 percent in 2002-03 and -26.4 percent in 2004-05. The important point is that all the Zones of Bihar have recorded a positive growth in yield of bhadai rice in 2000-01 except negative growth of -6.2 percent in Zone-1. Among all Zones, Zone-2 has registered highest average rate of growth of yield of 3.95 percent under bhadai rice crops over the period. Positive growth of yield of wheat is observed in Zone-1 in 2004-05 (6.9 percent), in Zone-2 in 2004-05 (9.3 percent), in Zone-3(A) in 2000-01 (2.9 percent) and in 2003-04 (11.4 percent) and in Zone-3(B) in 2001-02 (10.7 percent) and in 2005-06 (15.2 percent).

**The growth rates of Gross State Domestic Product (GSDP) of the states during pre and post bifurcation periods**

Bihar and Jharkhand have improved dramatically with massive jumps in per capita income and overall economic growth. From Table 7 we can observe that average growth rates for the period before the formation of the states (over 1994-95 and 2001-02) Jharkhand was growing at 3.6 per cent while Bihar grew at 4.9 per cent. The mother state Bihar was growing at faster rate over that period (Fig.2).

**Table 7- Growth before 2000: (Figures are in %)**

<b>YEARS</b>	<b>JHARKHAND</b>	<b>BIHAR</b>
1994-95	4.2	10.9
1995-96	2.6	-13.9
1996-97	-4.1	23.7
1997-98	26.3	-3.8
1998-99	5.7	7.5
1999-00	-2.7	3.6
2000-01	-9.8	16.0
Average Growth over 1994-95 and 2001-02	3.6	4.9

**Source: Planning Commission Data**

*Note: Even though the states did not exist before 2000, Planning Commission has data for the areas which formed the new states.*

From Table 8 it can be observed that Jharkhand has failed to match Bihar’s performance since 2000(Fig.3).

Data revealed that Bihar’s growth was mostly powered by a steady agricultural growth rate of 8.1 per cent over 2004-09, while the corresponding figure for Jharkhand was 1.4 per cent. This could be one of the reasons behind Jharkhand lagging Bihar in post 2000 periods. In respect of the average industrial growth rate over 2004-2009, Bihar registered 5.8 per cent whereas Jharkhand recorded much higher at 11.5 per cent.

Fig.2

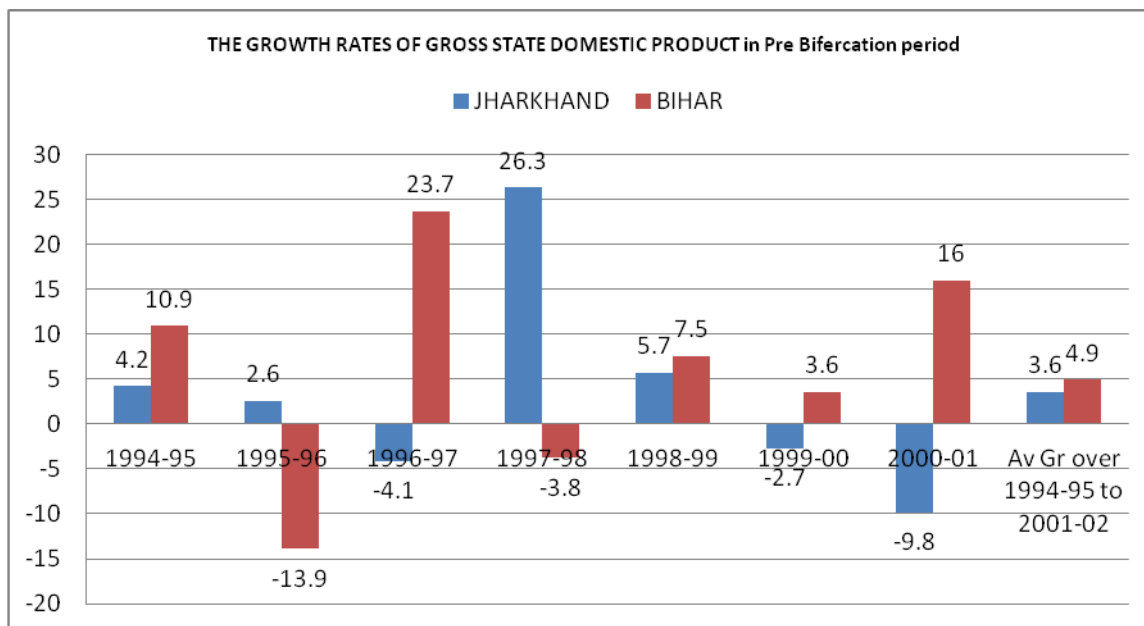


Table 8: Growth after 2000: (Figures are in %)

YEARS	JHARKHAND	BIHAR
2001-02	6.7	-4.7
2002-03	2.5	11.8
2003-04	8.0	-5.1
2004-05	15.2	12.1
2005-06	-3.2	0.9
2006-07	2.3	17.7
2007-08	20.5	7.6
2008-09	-1.7	14.5
2009-10	4.9	10.4
2010-11	6.0	14.7
2011-12	6.5	13.1
Average since 2004-05	6.3	11.4

Source: Planning Commission Data

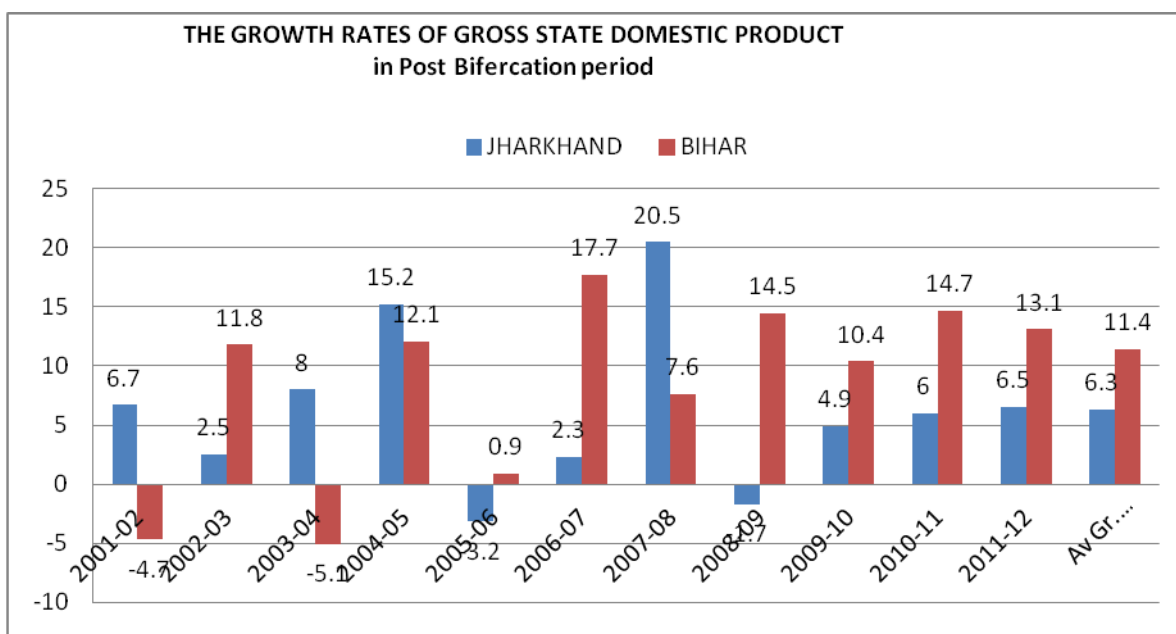


Fig.3

After the bifurcation in respect of per-capita income of the states Bihar and

Jharkhand have doubled the per-person income over the last decade (Table9).

**Table 9: Per-Capita Income of the states**

State	Per-Capita Income 2000-01 (Rs.)	Per-Capita Income 2010-11 (Rs.)	Per-Capita Income of 2010-11 as a multiple of 2000-01
1. Bihar	6,554	13,632	2.0
2. Jharkhand	9,980	21,734	2.1

Source: Planning Commission Data

Over 2004-09, Jharkhand has done a better job in reduction of poverty than Bihar. Jharkhand has reduced it by 6.2 per cent while Bihar has managed only by 0.9 per cent (Table10). If we take absolute number of poor people into account Bihar did the worst with an increase of 5 million (49 million to 54 million) over 2004-09. Jharkhand reduced the number of poor people by 1 million (12 million to 11 million).

**Table 10: Number of people below poverty line**

States	Poverty Rate 1993-94 (%)	Poverty Rate 2004-05 (%)	Poverty Rate 2009-10 (%)	% Reduction in poverty since 2004-05
1. Bihar	60.5	54.4	53.5	0.9
2. Jharkhand	NA	45.3	39.1	6.2

Note- Poverty Rate- Number of people below poverty line as a % of total population

Source: Planning Commission Data

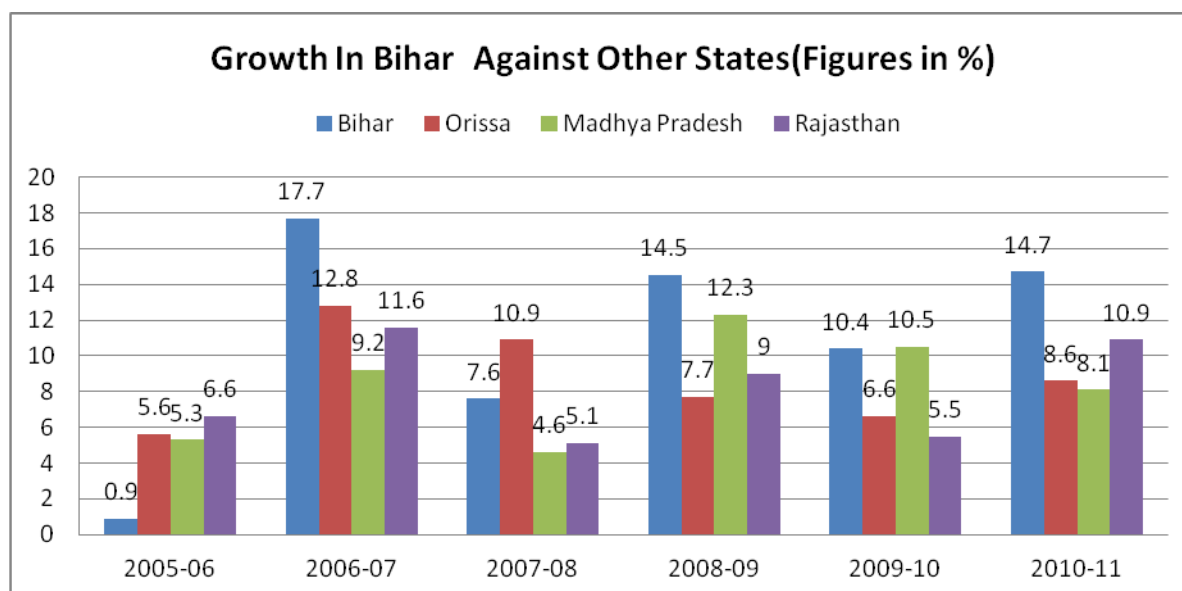
If we look at Bihar's year-wise growth rates performance against 'similar' states like Orissa, Madhya Pradesh, and Rajasthan we can conclude that Bihar had actually done better than almost all states (Table11 and Fig.4).

**Table 11: Growth In Bihar Against Other States (Figures in %)**

Year	Bihar	Orissa	Madhya Pradesh	Rajasthan
2005-06	0.9	5.6	5.3	6.6
2006-07	17.7	12.8	9.2	11.6
2007-08	7.6	10.9	4.6	5.1
2008-09	14.5	7.7	12.3	9.0
2009-10	10.4	6.6	10.5	5.5
2010-11	14.7	8.6	8.1	10.9
2011-12	13.1	7.1	N.A	N.A
Average Growth over 2005-12	11.3	8.5	8.3	8.1
Average Growth over 1994-02	4.9	3.9	4.7	7.3
Change in % growth over the 2 periods	6.3	4.6	3.6	0.8

Source: Planning Commission Data

Fig.4



## Conclusion

The study shows that the Bihar has diversified agriculture production in favour of horticulture and commercial crops at very slower rate during the post-bifurcation period. But, it is important to highlight that the area under food grains still occupies more than 86 percent of total cropped area due to the traditional cropping pattern as well as traditional food habits. Therefore, area, production and yield of non-food grain crops are more stable as compared to food grain crops. Among the agro-climatic Zones in Bihar, highest share in area and production of aghani rice, linseeds, sesamum, pea, gram and lentil has been found in Zone-3(B), while bhadaï rice, wheat, rapeseeds and mustard, and arhar has been found in Zone-1. Similarly, highest share of area and production of summer rice and sunflower has been found in Zone-2. Whereas, the highest share of area under moong cultivation has been found in Zone-2, but its production has not been maintained. As a result, share of production of moong has been recorded highest in Zone-1. Amongst the agro-climatic Zones of Bihar, the per capita income is highest in Zone-3(B) which is higher than the state average followed by Zone-3(A), Zone-1 and Zone-2. The most prosperous Zone in Bihar is Zone-3(B) and within it, Patna appears at the top. While, in Zone-3(A) and Zone-1, Munger and Begusarai appears most prosperous districts enjoying highest per capita net district domestic product (PCNDDP). Zone-2 is dominated by agriculture and allied sector and it is the least prosperous Zone in the state. In this Zone, Katihar appear to be the highest prosperous district, while Araria at the bottom is having lowest per capita income.

After the bifurcation of Bihar, the growth rate in terms of both GSDP and NSDP showed remarkable increase in almost all sub-sectors as compared to pre-bifurcation period. However, agriculture and allied sector has accounted miserable growth rate as compared to industrial and services sector. The share of agriculture and allied sector has declined from 46.70 percent to 26.51 percent during 1990-91 to 2008-09. Despite sharp decline of its share in NSDP, agriculture still plays a vital role in the development of Bihar.

The urgent need of the hour is to increase Investments in rural infrastructure for water management/soil conservation/ construction of roads to link rural area with urban area etc. With appropriate technology, infrastructure and policy support, it is possible to reverse the declining trend in food grain production and check the migration of the people from Bihar to other states.

## References

- 1 Census (2001), Government of India, <http://www.censusindia.net>
- 2 Central Statistical Organization (CSO) (2009), Ministry of Statistics and Programme Implementation, Government of India, New Delhi, (Data Compiled and Computed from <http://mospi.nic.in>)
- 3 Government of India (2008), *Bihar's Agricultural Development: Opportunities and Challenges*”, A Report of the Special Task Force on Bihar, New Delhi, April, p. 1.
- 4 Government of India (2009), Indian Horticulture Database, *Ministry of Agriculture*, pp. 11-13, <http://nhb.gov.in>
- 5 Government of India (2008), *Bihar's Agricultural Development: Opportunities and Challenges*”, A Report of the Special Task Force on Bihar, New Delhi, April, p. 16.
- 6 Government of Bihar (2009), Classification of Agro Climatic Zones, March, [www.krishi.bih.nic.in](http://www.krishi.bih.nic.in)
- 7 Government of Bihar (2003), *Bihar through Figure*, Department of Statistics and Evaluation, Patna
- 8 Government of India (2009), *Percentage of Population below Poverty Line*, Planning Commission of India, <http://planningcommission.gov.in>, 20<sup>th</sup> October, 61<sup>st</sup> NSSO Round. p. 18.
- 9 Government of Bihar (2008), *Bihar Economic Survey-2008-09*, Ministry of Finance, Patna, March, p. 23.
- 10 Government of India (2008), *Bihar's Agricultural Development: Opportunities and Challenges*”, A Report of the Special Task Force on Bihar, New Delhi, April, p. 16.