

# STATE LEVEL INEQUALITIES IN AGRICULTURAL DEVELOPMENT: AN EMPIRICAL ANALYSIS OF INDIA

Prasant Kumar Behera

Assistant Professor of Economics, Central University of Orissa, Koraput

Brundaban Sahu

Lecturer in Economics, Model Degree College, Rayagada

Subhasmita Das

Student, Integrated B.Ed-M.Ed, FM University, Balasore

**ABSTRACT-** As agriculture is considered to be the vital cog in the wheel of Indian economy, economic prosperity of the country depends upon long term sustainable development of agriculture with minimisation of disparities among the states. The disparities in agriculture among the different regions of India are result of various factors connected with each other. The present paper analyses the objective of regional disparities in agricultural development in different states of India on a number of indicators like percentage of agricultural workers, percentage of net sown area, inputs use, percentage of net irrigated area, cropping intensity, total agricultural productions and productivity, percentage of agriculture contribution to state GDP etc. Keeping the objective in view, the data for analysing the study have been collected from various secondary sources like Reserve Bank of India, NSSO, Central Statistics Office, Ministry of Statistics and Programme Implementation, GoI, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI, Department of Agricultural Research and Education, GoI, Registrar General of India, Census of India, GoI, and Indian Economic Survey. The relative variations, ranks and percentage growth in various aspects of agricultural development of different states have been computed during the period under consideration. Finding of the study shows existence of high inter-state disparities in agricultural development in the country over the years. The disparities in agricultural development among the different states emanate from numerous factors including credit-availability, monsoon, technology, topographical features, historical, institutional, natural and socio-economic factors. The study suggests the policy makers to increase the government expenditure in agricultural infrastructure including irrigation, technology, crop varieties and credit facilities, and to focus on the underdeveloped regions for removing the disparities and achieving inclusive and sustainable agricultural development in the country.

**Key Words:** Agriculture, Regional Disparity, Productivity, Technology, Percentage Growth

## INTRODUCTION

Agriculture has a significant role in the socio-economic fabric of India as it is the source of livelihood for more than 58 percent of the population of India. Agriculture has shifted its meaning from ancient and traditional one to modern and scientific way of cultivation of crops to bring multiple effects on productivity with a given level of input use. In 21<sup>st</sup> century, diversification of agriculture is essential, and furthermore, crop rotation and multiple cropping are required to maintain the quality of the soil by altering its different uses. When Indian agriculture comes into picture, it is very much unpredictable because of its climatic pattern, marked with uneven and erratic monsoon. There is wide variation in average rainfall ranging from 1200 cm in places like Cherapunji and Mawsyanaram to the places situated in desert areas which are receiving less than 10cm of average rainfall. A regional variation in agriculture is bound to occur in a country like India where climatic conditions vary from one part to another. Advent of Green Revolution added to the disparities in a greater way by facilitating the use of modern and scientific techniques in the states. States like Punjab, Haryana, Uttar Pradesh etc easily imbibed this technology as inputs in agriculture where as the states which are situated in undulating topographical regions having small size of land holdings found it extremely difficult to manage and operate the scientific technology, HYVs seeds, fertiliser, pesticides, irrigation etc. In the states situated in north-eastern parts of the country, located in hilly areas, the impact of the Green Revolution was found to be very negligent. Although measures were taken during 1980's and 1990's to improve the productivity in north-eastern and eastern states, paving way for some positive sign, the disparities, as a matter of fact, continued to thrive. In hilly and sloppy areas, soil erosion was a major bottleneck to retain the soil fertility, as the top soil got washed away during heavy rain because of large scale deforestation, adding to the misery.

Govt. has undertaken numerous schemes and programmes launching all over India to stimulate the growth in agriculture to a great extent. Rashtrya Krishi Vikas Yojana (RKVY) was launched in 2007 during 11<sup>th</sup> five year plan by the then Prime Minister of India Manmohan Singh, which sought to provide the States and Territories of India with autonomy to draw up plans for increased public investment in agriculture by incorporating information in local requirements. The states like Chhattisgarh, Odisha, Maharashtra, Tripura, Bihar etc were able to increase total agricultural outlay to a great extent but some other states denied to implement the same. Intensive Agricultural Development Plan, which is considered to be the first major plan undertaken for agriculture after Independence of India to provide loans, seeds, fertilizer, tools to farmers, also failed due to unawareness of farmers and concerned authorities. Contribution of agriculture to Gross State Domestic Product is of prime importance, the share of agriculture to state and national GDP is decreasing, enabling a good trend but if the actual production and

productivity is declining then it is pulling us towards a prosperous yet hungry world tomorrow. As population is rapidly growing by leaps and bounds, the land-man ratio is deteriorating, giving birth to synchronisation of agricultural land; keeping this in focus, there is huge requirement boost of per hectare productivity. The factors which are mainly responsible for disparities includes govt. subsidies, farmers knowledge on cultivation, social environment, application and adaptation of technology, monsoon, topography, uneconomic land holding patterns, natural factors, central govt. biasedness, lack of input knowledge, outmoded agricultural technology, inadequate irrigation facilities, population pressure on land, lack of credit etc. These factors created wide gap in the production and productivity of crops across the nation, leading to variation in agricultural development in different parts of the country.

It is of great importance to study the regional difference in agricultural development to bring in the actual scenario into picture. As agricultural sector needs more attention in populated countries like India to feed its vast population with limited availability of agricultural land, the present paper endeavours to find out the root cause of disparities in agricultural development in the different states. It focuses upon multidimensional areas where the disparities are prominently visible. Here, I have tried to deal with the indicators that are badly affecting the disparities in agriculture like percentage of agricultural workers, net shown area, input use, net irrigated area, cropping intensity, total agricultural production and productivity, percentage of agriculture contribution to states' GDP, etc.

### REVIEW OF LITERATURE

Raman, R. & Kumari, R. (2012) have worked upon district-wise regional disparities in agricultural development in Uttar Pradesh. They viewed that population pressure and lack of specific regional policies adversely affected the regional agricultural development. Singh, K. (2011) has specifically focused on the impact of banking sector reforms upon rural agricultural finance. She found that banks in general preferred to lend to economically better sections than the lower sections of the society, leading to backwash effect. Kumar, S. & Gupta, S. (2015) revealed that the cropping pattern at state level transitioned from food grains to high value crops but the transformation was not uniform across the states. They have suggested that the investment in new and modern technology in the rural agricultural lands must be encouraged so as to reduce the disparities. Satyasai, K. J. S. (2012) empirically examined the relative access of different categories of farm household to formal credit and its impact on fertilizer use. His finding clearly indicated that inequalities in distribution of number of loans gave rise to regional disparities in agricultural credit vis-a-vis rural finance. Das, A., Senapati, M. and John, J. (2009) have illustrated that there are wide regional disparities in the disbursement in agricultural credit by scheduled commercial banks. At the same time, the share of agricultural GDP in total GDP was falling. Chand, R., Garg, S. and Panday, L. (2009) emphasised that there was a vast variation in productivity of crop sectors across districts in the country and in most of the states. This clearly called for a regionally differentiated strategy for future growth and development of agriculture sector in the country. In general, very low and low productivity districts were characterised by low rainfall, low irrigated area and lesser amount of fertilizer use. Jain, V. and Singh, S. (2014) suggested that the financial institutions should be developed for rapid financial inclusion of marginal, small, dalit and tribal farmers. So far, the banking system has catered to the financial needs of the medium and large farmers. Once the marginal farmers have adequate access to credit, the performance of agriculture is bound to improve. Using Principal Component Analysis technique and constructing district-wise agricultural development indices, Patra, R. (2014) has analysed the spatio-temporal variations in agricultural development in Odisha from 2001-02 to 2011-12. His findings illustrated that the high and yawning disparities were due to the differences in location, topography, natural endowments, technology adoption, irrigation spread, crop diversification and commercialization in agriculture. For moderating spatial inequalities and achieving a less imbalanced regional development in agriculture, he has suggested to increase public investment in agricultural infrastructure including irrigation, establishing appropriate farming systems, developing suitable and affordable technology and crop varieties, augmenting credit delivery and designing region and crop-specific plans and strategies.

### OBJECTIVE, DATA SOURCES AND METHODOLOGY

The main objective of this paper is to find out the disparities in agricultural development in different states of India. Keeping the objective in view the data for analysing the study have been collected from various secondary sources like Reserve Bank of India, NSSO, Central Statistics Office, Ministry of Statistics and Programme Implementation, GoI, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI, Department of Agricultural Research and Education, GoI, Registrar General of India, Census of India, GoI, and Indian Economic Survey. Statistical tables have been represented through ranks and percentage of growth to analyse and explain the various issues related with the regional/state-wise disparities in agricultural development in India.

### REGIONAL INEQUALITIES IN AGRICULTURAL DEVELOPMENT IN INDIA

India as a land of agriculture is preoccupied with better climatic conditions; still it is unevenly distributed in terms of agricultural production and productivity. When we divert our focus towards the nature and types of soil availability, which is considered as the main determinant of the types of food crops to be produced, it is seen that the soil widely varies from one region to the other. In this study, the state-wise disparities in terms of production, yield and productivity, employment creation, contributions to state GDP, cropping intensity, inputs used in agricultural production i.e. fertilisers, pesticides, value of output, agricultural labour have been analysed and discussed.

#### Factors Affecting Regional Disparity in Agricultural Development

Variability in agricultural growth and development between states and regions underwent various changes due to advancement in technology, irrigation facilities, HYV seeds, pesticides, chemical fertilizers etc. But there are some factors which

very difficult to be avoided in the present circumstances. The factors which are greatly responsible for differences in agricultural disparities include;

- Climate and Topography*: In India, physical features are quite unevenly distributed, giving rise to difference in temperature as evidenced from the fact that longitudinal extend of India is from 8°4' N to 37°6' N latitudes. Because of this vast extent of land mass, temperature decreases with increasing distance from equator. Indian sub-continent consists of various types of land forms such as plains, plateaus, mountains, coastal areas, desert lands etc that will off course lead to difference in productivity.
- Lacunae in Land Reform Measures*: The land reform measures which were introduced in 1950's and 1960's were of mere applicability. The measures like abolition of zamindari system, fixation of ceiling, consolidation of holding etc are not properly implemented, small land holding forbids the farmers to utilise modern technology thereby reducing the per hectare productivity.
- Unavailability of Agricultural Credits and Markets*: This has been a very serious problem faced by the Indian farmers that loans are not being sanctioned to them due to either lack of collateral or farmers inability to repay back due to crop failure. As natural factors sometimes betray the farmers, it leads to loss of crops and, rather unfortunately, farmers' suicides.
- Soil Erosion*: Mass erosion of top most layer of the soil takes place specifically in mountainous areas; the regions which are located in these areas have to suffer from loss of fertility of the soil hence giving rise to less production and productivity.
- Difference in Monsoon*: Indian monsoon is very peculiar in character, some areas receives very scanty rainfall, where some other areas receive plentiful rainfall. Due to these variations, production of food crops varies not only in amount of crop production but also in types of crops produced.
- Cropping Patterns and Multiple Cropping*: The parts of the country where there are perennial flow of river and those regions which are well connected with canal irrigation are expected to grow crops more than once, but those areas which completely rely upon rain for cultivation can't go for the same.
- Agricultural Inputs and Green Revolution*: Green Revolution which came to India in mid 60's reflected a biased result favouring north-western part of the country basically where modern technology could be applied without hesitation but same was not possible to hilly and uneven areas of the country and to the small acres of land.

#### Area Under Agriculture

India's agricultural land is the culmination of arable land, and land under permanent crops and pastures. Around 35% of its agricultural irrigated land refers to the agricultural areas purposely provided with water, including land irrigated by controlled flooding. Lands are usually fertile near the river belts; northern alluvial belts are more fertile than any other regions in India. Different types of soil suits for different crops, for example black soil which is plentifully found in western parts of the country is most suitable for cotton and sugarcane production. Similarly hilly areas are favourable for coffee and tea production.

The availability of agricultural land for cultivation is decreasing day by day due to encroachment for building houses, institutions, industries etc. The per capita availability of agricultural land is going to decrease in a faster rate in near future showing the negative growth in the per capita availability of land-man ratio, there by agricultural land- man ratio.

**Table-1**  
**State-Wise Net Area Shown Between 2003-04 and 2012-13**  
**(Thousand Hectares)**

State	2003-04	2012-13	Percentage of Growth	Rank
Andhra Pradesh	10118	11117	9.87	5
Arunachal Pradesh	201	216	7.46	6
Assam	2753	2811	2.11	9
Bihar	5712	5402	-5.43	22
Chhattisgarh	4779	4671	-2.26	18
Goa	141	132	-6.38	23
Gujarat	9852	10302	4.57	7
Haryana	3534	3513	-0.59	15
Himachal Pradesh	541	543	0.37	11
Jammu & Kashmir	749	745	-0.53	13
Jharkhand	1565	1406	-10.16	27
Karnataka	9847	9793	-0.55	14
Kerala	2190	2048	-6.48	24
Madhya Pradesh	14945	15353	2.73	8
Maharashtra	17432	17344	-0.5	12
Manipur	217	309	42.4	1
Meghalaya	227	285	25.55	2
Mizoram	98	116	18.37	4
Nagaland	305	380	24.59	3
Odisha	5795	4386	-24.31	28
Punjab	4240	4150	-2.12	18
Rajasthan	17394	17479	0.49	10
Sikkim	78	77	-1.28	17
Tamil Nadu	4689	4544	-3.09	20
Tripura	280	256	-8.57	26
Uttar Pradesh	16750	16564	-1.11	16
Uttarakhand	761	706	-7.23	25
West Bengal	5428	5205	-4.11	21
All India	140708	139932	-0.55	

Source: Land Use Pattern, Ministry of Agriculture and Farmers Welfare, GoI

The above table represents the state-wise net shown area between the period 2003-04 and 2012-13. Most of the states have shown negative growth because of the encroachment of lands for building infrastructures, industries, human settlements etc. States like Manipur (42.4%), Meghalaya (25.55%), Nagaland (24.59%), Mizoram (18.37%) etc. ranking high in the order, are situated in the north-eastern hilly areas of the country show positive growth, reason being the clearance of forests and conversion of them to agricultural land. Negative growth is observed in states like Odisha (-24.31%), Jharkhand (-10.16%), West Bengal (-4.11%), Jammu & Kashmir (-0.53%) etc which are lowest ranking states as these states are shifting towards modernisation, and growth of industries, attraction of tourists, and rapid growth of human settlement escalated the denudation of agricultural land.

**Table-2**  
**State-Wise Total Cropped Area Between 2003-04 and 2012-13**  
**(Thousand Hectares)**

State	2003-04	2012-13	Percentage of Growth	Rank
Andhra Pradesh	12366	13650	10.38	10
Arunachal Pradesh	254	285	12.2	8
Assam	3957	4197	6.07	12
Bihar	7882	7778	-1.32	21
Chhattisgarh	5709	5691	-0.32	18
Goa	169	163	-3.55	24
Gujarat	11421	12600	10.32	11
Haryana	6388	6376	-0.19	17
Himachal Pradesh	956	947	-0.94	20
Jammu & Kashmir	1102	1162	5.44	13
Jharkhand	1750	1657	-5.31	25
Karnataka	11450	11748	2.6	14
Kerala	2954	2592	-12.25	27
Madhya Pradesh	19788	23130	16.89	7
Maharashtra	22190	21874	-1.42	22
Manipur	217	309	42.4	1
Meghalaya	272	340	25	4
Mizoram	98	116	18.37	6
Nagaland	370	489	32.16	3
Odisha	8637	5069	-41.31	28
Punjab	7907	7870	-0.47	19
Rajasthan	21664	23954	10.57	9
Sikkim	121	144	19.01	5
Tamil Nadu	5316	5140	-3.31	23
Tripura	283	386	36.4	2
Uttar Pradesh	25425	25821	1.56	15
Uttarakhand	1222	1124	-8.02	26
West Bengal	9661	9678	0.18	16
All India	189661	194399	2.5	

Source: Land Use Pattern, Ministry of Agriculture and Farmers Welfare, GoI

The above table focuses upon gross cropped area between the same time period as in table-1. North-eastern states and Himalayan states such as Manipur (42.4%), Nagaland (32.16%), Meghalaya (25%) etc rank high in the above table showing the positive growth as in case of net sown area. Madhya Pradesh, the state of India having highest forest cover in India, is also following the above states as farming practices are shifting and new non-agricultural lands are converted for agricultural purposes. When we talk about the states having negative growth between this period, sharp rising of population and decreasing importance of agriculture are observed to be the main reasons behind it. Lowest ranking states include Odisha (-41.31%), Kerala (-12.25%), and Goa (-3.5%); the factor responsible for this are same as in case of net sown area.

**Table-3**  
**State-Wise Percentage Growth in Cropping Intensity** (‘000 Hectares) Between  
**2009-10 to 2011-12**

State	2009-10	2011-12	Percentage of Growth	Rank
Andhra Pradesh	125.7	123.3	-1.9	24
Arunachal Pradesh	130.2	131	0.61	17
Assam	145.9	148.5	1.78	11
Bihar	136.8	141.7	3.58	5
Chhattisgarh	118.7	121.1	2.02	10
Goa	121.8	124.4	2.13	9
Gujarat	107.6	127.1	18.12	2
Haryana	178.9	184.7	3.24	8
Himachal Pradesh	174.7	176.6	1.08	14
Jammu & Kashmir	155.7	155.6	-0.06	21
Jharkhand	111.9	115.6	3.3	7
Karnataka	123.7	121.3	-1.9	23
Kerala	128.4	130.5	1.63	12
Madhya Pradesh	143	147.8	3.35	6
Maharashtra	129.9	126.1	-2.92	26
Manipur	100	100	0	18
Meghalaya	118.9	118.9	0	19
Mizoram	100	100	0	20
Nagaland	134.8	125	-7.27	28
Odisha	115.7	113	-2.33	25
Punjab	189.4	191.2	0.95	15
Rajasthan	128.1	135.9	6.08	
Sikkim	186	177.3	-4.67	27
Tamil Nadu	113.9	118.1	3.68	5
Tripura	104.9	145.2	38.41	1
Uttarakhand	158.4	158.5	0.06	17
Uttar Pradesh	153.4	155.3	1.23	13
West Bengal	181.3	179.9	-0.77	22

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI

Above table depicts the cropping intensity changes between the years 2009-10 and 2011-12. It is the fraction of cultivated area that is harvested (i.e. Cropping Intensity = Gross Cropped Area/Net Shown Area×100). It shows a mixed result where some states have positive growth where as others show negative results. States like Karnataka (-1.9%), Nagaland (-7.27%), Sikkim (-4.67%), Maharashtra (-2.92%), Odisha (-2.33%), Andhra Pradesh (-1.9%), and West Bengal (-0.77%) are having negative percentage of growth where as others have positive percentage of growth led by Tripura (38.41%) and Gujarat (18.12%). Although growth is either positive or negative the cropping intensity shows great spatial variation with higher level in northern plains like Punjab, Himachal Pradesh, West Bengal and low in the states of dry and less rain fed areas such as Rajasthan, Gujarat, Maharashtra etc.

#### Green Revolution with Biased Result

Green Revolution started in India due to its popularity in Western Europe, after the term was popularised by father of green revolution sir Norman Borlaug because of his *technical invention per hectare productivity multiplied*. On the other hand noticing these changes Dr. M. S. Swaminathan (regarded as father of Indian Green Revolution) brought the same to India to experiment in agricultural fields. Green Revolution started in India during 1965 having the sole motto of increasing the

productivity and yield rate of different food crops and non-food crops to supplement its ever growing population visa-vise to incur foreign earning through increasing agricultural export. This revolution started to boost the per hectare productivity and to supplement to the large growing population of the country, but this method of HYVs seeds along with chemical, fertilizer, pesticides etc could only be applied to limited crops and to limited areas. This specifically benefited the production of wheat followed by rice, whereas the application of technology and green revolution required large tracks of land where mechanised farming is possible but India is known by small and marginal land holdings. Punjab, Haryana, Western Uttar Pradesh and some western regions of the country got benefited by application of this technology but the same was not possible to be implemented in north-eastern and hilly areas of the country.

**Table-4**  
**Area Under High Yielding of Rice in**  
**Major States (In '000 Hectares) Between 2000-01 to 2007-08**

State	2000-01	2007-08	Percentage of Growth	Rank
Andhra Pradesh	NA	3824	NA	
Assam	NA	NA	NA	
Bihar	1737	1824	5.01	8
Chhattisgarh	581	907	56.11	1
Goa	49	52	6.12	7
Gujarat	424	628	48.11	2
Haryana	NA	824	NA	
Himachal Pradesh	NA	NA	NA	
Jammu & Kashmir	183	127	-30.6	13
Jharkhand	NA	NA	NA	
Karnataka	1230	1245	1.22	9
Kerala	226	202	-10.62	12
Madhya Pradesh	154	155	0.65	10
Maharashtra	1412	1534	8.64	6
Meghalaya	NA	NA	NA	
Odisha	2629	3272	24.46	4
Punjab	NA	2610	NA	
Rajasthan	NA	105	NA	
Tamil Nadu	NA	279	NA	
Uttar Pradesh	NA	NA	NA	
West Bengal	NA	NA	NA	
Dadra & Nagar Haveli	10	12	20	5
Delhi	6	8	33.33	3
Daman & Diu	1	1	0	11
Puducherry	25	14	-44	14

Source: CSO, Ministry of Statistics and Programme Implementation, GoI

The table clearly indicates that states lying to the north and north-western part of the country are mostly benefited after the implementation of modern technology and mechanized farming techniques. On the contrary, southern and north-eastern part of the country faced many hurdles to implement the same in their agricultural fields; thereby green revolution gave rise to biased result towards few states ignoring others badly. Chhattisgarh (56.11%), Gujarat (48.11%), Delhi (33.33%), and Odisha (24.46%) rank highest in utilization of modern technology; besides, training to the farmers and rural agricultural labourers played

a vital part in implementation of mechanized tools in these states. The states which rank lower in the above table, i.e. Jammu & Kashmir (-30.60%), Kerala (-10.62%), and Madhya Pradesh (0.65%), excluding Kerala, have small patches of plain areas which are not suitable for application of modern technology.

### Agricultural Inputs and Labour

Agricultural inputs are defined as products permitted for use in organic farming. This includes feed stuffs, fertilizers, and permitted plant protection products as well as cleaning agents and additives used in products. The growing of crops is not an easy process and requires lots of inputs to get a desired level of output starting from the sowing of seeds till the harvesting of crops. In India as most of the farmers are either less literate or completely illiterate, they are unaware about different input techniques to be applied in agriculture. It is obvious from the fact that less educated and less developed states use less fertilisers and pesticides. Although more and more use of chemical and fertiliser aggravates the quality of the soil but it helps in increasing the productivity of crops. The states/regions which fall under the category of higher input utilization basically results in high productivity. Agricultural labourers are those who are directly or indirectly involved in tilling the land or involved in agricultural field to earn a living. In India agricultural labours are plentifully found yet there is less development in agriculture. The states situated in hilly areas, where other employment opportunities are not available, people easily turn themselves to the low paid agricultural activities, and this gives rise to low productivity in agriculture. In India this scenario is peculiar forming the disguised unemployment.

**Table-5**  
**Percentage Growth in Fertiliser Consumption (Kg/Ha) in Major States Between 2006-07 & 2012-13**

States	2006-07	2012-13	Percentage of Growth	Rank
Andhra Pradesh	203.61	189.3	-7.02	13
Assam	49.26	68.26	38.57	4
Bihar	152.32	212.23	39.33	3
Gujarat	111.07	109.58	-1.34	12
Haryana	166.72	207.58	24.5	8
Karnataka	117.34	117.23	-0.09	11
Kerala	57	104.71	83.7	1
Madhya Pradesh	47.13	58.74	24.63	7
Odisha	84.52	58.74	-30.5	15
Maharashtra	84.52	102.73	21.54	9
Punjab	210.06	250.19	19.1	10
Tamil Nadu	183.57	164.58	-10.3	14
Uttar Pradesh	140.37	183.23	30.53	5
West Bengal	127.5	163.17	27.97	6
Rajasthan	36.29	51.7	42.46	2
All India	104.5	128.34	22.81	

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI

Above table presents the amount and percentage growth of fertiliser consumption from the year 2006-07 to the year 2012-13 in various states of India. Fertiliser consumption per/ha in agricultural crops in India increased between 2006-07 to 2012-13 by 22.81 percent which shows that people are gradually applying fertiliser during cultivation of crops to increase the productivity. Barring some of the states like Odisha (-30.5%), Tamil Nadu (-10.30%), Andhra Pradesh (-7.02%), Gujarat (-1.34%), and Karnataka (-0.09%), other states show the increasing trend in fertiliser consumption. Among them, Odisha registered the highest percentage of negative growth amounting to 30.50 whereas Kerala registered the highest percentage of positive growth of 83.70. The fertilizer consumption is required basically in cash crops and in the areas of inferior soil types to increase per hectare productivity.

**Table-6**  
**State-Wise Percentage Growth of Agricultural Labourers**  
**Between the Year 2001 and 2011**

States\UTs	2001	2011	Percentage of Growth	Rank
Jammu & Kashmir	246421	547705	122.26	4
Himachal Pradesh	94171	175038	85.87	8
Punjab	1489861	1588455	6.61	
Chandigarh	563	1687	199.64	2
Uttarakhand	259683	403301	55.3	13
Haryana	1278821	1528133	19.49	25
Delhi	15773	39475	150.26	3
Rajasthan	2523719	4939664	95.72	6
Uttar Pradesh	13400911	19939223	48.79	15
Bihar	13417744	18345649	36.72	18
Sikkim	17000	25986	52.85	14
Arunachal Pradesh	18840	36171	91.99	7
Nagaland	30907	62962	103.71	5
Manipur	113630	111061	-2.26	31
Mizoram	26783	41787	56.02	11
Tripura	276132	353618	28.06	21
Meghalaya	171694	198364	15.53	26
Assam	1263532	1845346	46.04	16
West Bengal	7362957	10188842	38.37	17
Jharkhand	2851297	4436052	55.58	12
Odisha	4999104	6739993	34.82	19
Chhattisgarh	3091358	5091882	64.71	10
Madhya Pradesh	7400670	12192267	64.74	9
Gujarat	5161658	6839415	32.5	20
Daman & Diu	1323	772	-41.64	35
Dadra & Nagar Haveli	14715	17799	20.95	24
Maharashtra	10815262	13486140	24.69	22
Andhra Pradesh	13832152	16967754	22.66	23
Karnataka	6226942	7155963	14.91	27
Goa	35806	26760	-25.26	34
Lakshadweep	0	0	0	30
Kerala	1620851	1322850	-18.38	33
Tamil Nadu	8637630	9606547	11.21	28
Puducherry	72251	68391	-5.34	32
Andaman & Nicobar Islands	5169	16567	220.5	1
India	106775330	144329833	35.17	

Source: Registrar General of India, Census of India, GoI

Above table shows the state-wise percentage growth in agricultural labourers between 2001 and 2011. Arunachal Pradesh (91.99%), Himachal Pradesh (85.87%), Madhya Pradesh (64.74%), and Chhattisgarh (64.71%) have high increase in penetration of agricultural labourers than other states; this is because the sharp rise in population in those states tends to convert towards agricultural work. Few states like Goa (-25.26%), Kerala (-18.38%) etc are diverting their workforce towards non-agricultural work, these states are ahead in terms of development, leading to mass attraction of literate agricultural labourers.

Middle ranking states like Assam, West Bengal, Odisha etc are showing average growth as people are migrating for other works, if they are not able to survive through agricultural earnings.

### Differences in Yield, Production and Productivity

Yield, production and productivity might speak about a similar concept but they are different from each other. The production of food grains in large states has to be more than the other because of availability of man power and natural resources i.e. land, but productivity is mainly concerned about the per hectare production. The regions where irrigation facilities are available provide more productivity than the other regions. In India some central, western and northern states are growing rapidly in production of agricultural crops, reason being their acceptance and innovation in irrigation. Output from agriculture is unpredictable, the states which emphasise in agriculture as their important source of livelihood and income generation activity are able to get good returns, and reverse is true for the states those which gives less importance to agriculture.

**Table-7**  
**State-Wise Production of Food Crops (In Thousand Tonnes)**  
**Between 2000-01 to 2012-13**

State	2000-01	2012-13	Percentage of Growth	Rank
Andhra Pradesh	16029.2	18662.5	16.43	19
Arunachal Pradesh	215.3	264	22.62	15
Assam	4166.5	5280.6	26.74	13
Bihar	12056.3	15939.6	32.21	12
Chhattisgarh	2901.3	7643.6	163.45	2
Goa	153	313.8	105.1	5
Gujarat	2539	7056.2	177.91	1
Haryana	13294.4	16226.4	22.05	16
Himachal Pradesh	1112.2	1480.7	33.13	11
Jammu & Kashmir	1114.5	1831.9	64.37	8
Jharkhand	2011	4557.5	126.63	4
Karnataka	10986	10863.3	-1.12	24
Kerala	765.1	511.8	-33.11	26
Madhya Pradesh	10185.4	23690.4	132.59	3
Maharashtra	10134.9	10973.3	8.27	21
Manipur	395.8	336.7	-14.93	25
Meghalaya	216	265	22.69	14
Mizoram	124	41.8	-66.29	28
Nagaland	322.7	579.1	79.45	7
Odisha	4984.2	8008.8	60.68	9
Punjab	25324.5	28543	12.71	20
Rajasthan	10040.6	18367.7	82.93	6
Sikkim	103.2	106	2.71	23
Tamil Nadu	8616.8	5592.8	-35.09	27
Tripura	523.1	725.2	38.64	10
Uttar Pradesh	1726.4	1827.7	5.87	22
Uttarakhand	42714.9	50745.4	18.8	18
West Bengal	13815	16546.5	19.77	17
All India	196571.3	256899.2	30.69	

Source: Agricultural Statistics at a Glance, Ministry of Agriculture & Farmer Welfare, GoI

The above table depicts the state-wise production of food crops between the period 2000-01 and 2012-13. As production needs to be increased for supplying food to growing population, barring few states, others show positive growth. If the food shortage occurs, the future brains from the rural areas will die from hunger and malnutrition that is why each and every state is striving hard to use modern scientific method to increase productivity. Apart from states like Mizoram (-66.29%), Tamilnadu (-35.09%), Kerala (-33.11%), Manipur (-14.93%), and Karnataka (-1.12%), other states registered positive growth led by Gujarat (177.91%), Chhattisgarh (163.45%), Goa (105.10%) etc.

**Table-8**  
**State-Wise Percentage Growth in Yield of Total Food Grains**  
**(KG/Ha) Between 2004-05 to 2011-12**

State	2004-05	2011-12	Percentage of Growth	Rank
Andhra Pradesh	22138	22519	1.72	23
Arunachal Pradesh	1178	1767	50	3
Assam	1405	1704	21.28	14
Bihar	1192	2098	76	1
Chhattisgarh	979	1384	41.36	5
Goa	2456	2272	-7.49	28
Gujarat	1412	1874	32.71	9
Haryana	3092	3879	25.45	11
Himachal Pradesh	1923	1911	-0.62	27
Jammu & Kashmir	1686	1690	0.237	25
Jharkhand	1234	1798	45.7	4
Karnataka	1388	1629	17.36	17
Kerala	2278	2695	18.3	16
Madhya Pradesh	1131	1510	33.51	8
Maharashtra	836	1155	38.15	6
Manipur	2390	2397	0.29	24
Meghalaya	1674	1873	11.88	19
Mizoram	1577	1920	21.75	12
Nagaland	1577	1920	21.75	13
Odisha	1300	1303	0.23	26
Punjab	4040	4364	8.01	20
Rajasthan	1008	1348	33.73	7
Sikkim	1406	1495	6.33	22
Tamil Nadu	1874	3162	68.72	2
Tripura	2179	2620	20.23	15
Uttar Pradesh	1961	2498	27.38	10
Uttrakhand	1697	1945	14.61	18
West Bengal	2479	2645	6.69	21
All India	1652	2078	25.78	

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI

The above table shows the percentage change in yield of food grains between the year 2004-05 and 2011-12. Between this period 25.78 percentages of growth occurred in India as a whole in terms of yield of food grains. Bihar (76.00%), Tamil Nadu (68.72%), Chhattisgarh (41.36%), and Maharashtra (38.15%) registered the highest percentage of growth, contributing largely to the supply of food grains. States like Goa (-7.49%), Himanchal Pradesh (-0.62%) etc followed the negative path.

**Table-9**  
**State-Wise Percentage Growth in Total Value of Output from Agriculture between 2004-05 to 2010-11 (Rupees in Lakhs)**

State/U.Ts	2004-05	2010-11	Percentage of Growth	Rank
Andhra Pradesh	3623241	4937500	36.27	9
Arunachal Pradesh	50875	54221	6.57	27
Assam	1208793	1439641	19.09	20
Bihar	1484181	1808321	21.83	18
Goa	59325	52886	-10.85	31
Gujarat	2780861	4017140	44.45	6
Haryana	1876877	2161604	15.17	21
Himachal Pradesh	429302	570381	32.86	10
Jammu & Kashmir	481804	661363	37.26	8
Karnataka	2694964	4151569	54.04	5
Kerala	1435183	1264405	-11.89	32
Madhya Pradesh	2894408	3686652	27.37	13
Maharashtra	4584699	6459698	40.89	7
Manipur	82422	130690	58.56	4
Meghalaya	86061	85940	-0.14	29
Mizoram	28869	67144	132.58	1
Nagaland	65396	108477	65.87	3
Odisha	1593871	1930748	21.13	19
Punjab	2756558	2984546	8.27	26
Rajasthan	2651382	3415276	28.81	11
Sikkim	28349	36196	27.67	12
Tamil Nadu	1928277	2384924	23.68	15
Tripura	170964	210595	23.18	17
Uttar Pradesh	7160911	8173988	14.14	23
West Bengal	3874186	4312366	11.31	24
Andaman & Nicobar Islands	16321	18655	14.3	22
Dadra & Nagar	5608	5925	5.65	28
Daman & Diu	864	551	-36.22	34
Delhi	54544	49225	-9.75	30
Lakshadweep	2823	3490	23.62	16
Puducherry	18309	13766	-24.81	33
Chandigarh	1075	644	-40.09	35
Jharkhand	542039	689471	27.19	14
Chhattisgarh	766911	1279326	66.81	2
Uttarakhand	409378	447126	9.22	25
Total	45849632	57614448	25.65	

Source: Ministry of Statistics and Programme Implementation, GoI

The above table presents the total value of output from agriculture by respective states between the years 2004-05 and 2011-12. The positive growth is led by Chhattisgarh (66.81%), Nagaland (65.87%), Karnataka (54.04%) etc having more than 50 percentage of growth, this is because of improved irrigation facilities and adoption of new technology in production process, whereas states like Kerala (-11.89%), Goa (-10.85%), and Meghalaya (-0.14%) show negative percentage of growth during this period.

### Agriculture as a Contributor to State Gross Domestic Product

The contribution of agriculture to national Gross Domestic Product of India is continuously decreasing over the years. Here the percentage growth is calculated by taking the sum of money value of agricultural output in 2011-12 in correspondence with sum of money value of agricultural output in 2004-05. There might be a decrease in percentage contribution from agriculture to total state GDP but output from agriculture increased between these two periods. Large states and less developed states have shown the highest percentage of growth between these two periods. Agriculture contribution at least at substantial level to the GDP is to be maintained and the negative growth of contribution is to be checked for smooth development of the economy.

**Table-10**  
**Percentage Growth in GSDP from Agriculture and Allied Sectors**  
**Between 2004-05 and 2011-12 (Rupees in Lakhs)**

State	2004-05	2011-12	Percentage of Growth	Rank
Andhra Pradesh	5634388	7653295	35.83	13
Arunachal Pradesh	122443	163993	33.93	15
Assam	1365566	1725451	26.35	17
Bihar	2452979	3375476	37.6	12
Chhattisgarh	1015910	1599078	57.4	5
Goa	99811	101396	1.58	26
Gujarat	3270600	5115567	56.41	6
Haryana	2212502	2972104	34.33	14
Himachal Pradesh	613297	709171	15.63	23
Jammu & Kashmir	766153	894790	16.78	22
Jharkhand	891672	1584185	77.66	1
Karnataka	3118984	4321144	38.54	11
Kerala	2084375	1092792	-47.57	28
Madhya Pradesh	3123830	4734948	51.57	7
Maharashtra	4492660	6574254	46.33	10
Manipur	127024	145101	14.23	25
Meghalaya	152507	182173	19.45	19
Mizoram	63025	101221	60.6	4
Nagaland	202912	267043	31.6	16
Odisha	1825698	2150767	17.8	21
Punjab	3161249	2588605	-18.11	27
Rajasthan	3272993	4949600	51.22	8
Sikkim	32325	55212	70.8	3
Tamil Nadu	2436179	3667249	50.53	9
Tripura	223164	393385	76.27	2
Uttar Pradesh	7757076	9621311	24.03	18
Uttarakhand	552040	654555	18.57	20
West Bengal	4993552	5705989	14.26	24

Source: Ministry of Statistics and Programme Implementation, GoI

\*Includes Forestry, Logging and Fishing

Above table reflects the GSDP from agriculture and allied sectors at constant prices (2004-05) between 2004-05 and 2011-12. Jharkhand (77.66%), Tripura (76.27%), and Sikkim (70.80%) are the states where highest amount of percentage growth is seen. Jharkhand accounted for 77.66 percentage of growth in agriculture and allied sector between 2004-05 and 2011-12, when it comes to share to GSDP, whereas Punjab (-18.11%), which is considered to be the agriculturally well developed state, shows

the negative growth between these years along with Kerala (-47.57%). The states having more agricultural area under their belt show average percentage increase in contribution to state Gross Domestic Product. Overall, India is showing a negative trend in percentage of contribution to National Gross Domestic Product which was more than 50 percent in 1950's that has declined to 14 percent at present.

**Table-11**  
**Gross State Domestic Product from Agriculture Including Livestock**  
**at Constant (2004-05) Prices for 2010-11 (Rupees in Lakhs)**

State\UT	GSDP from Agriculture	Total GSDP	% share of Agriculture In Total GSDP	Rank
Andhra Pradesh	6655400	37214200	17.88	7
Arunachal Pradesh	N.A	N.A	N.A	
Assam	1461357	7508207	19.46	5
Bihar	2445250	14203067	17.22	9
Jharkhand	1125482	7804519	14.42	12
Goa	N.A	N.A	N.A	
Gujarat	N.A	N.A	N.A	
Haryana	2464679	16538526	14.9	11
Himachal Pradesh	584632	3911186	14.95	10
Jammu & Kashmir	657883	3788692	17.36	8
Karnataka	3542416	27135646	13.05	15
Kerala	N.A	N.A	N.A	
Madhya Pradesh	N.A	N.A	N.A	
Chhattisgarh	965663	8487986	11.38	16
Maharashtra	5171485	77501995	6.67	20
Manipur	145993	718409	20.32	4
Meghalaya	139608	1025915	13.61	14
Mizoram	N.A	N.A	N.A	
Nagaland	N.A	N.A	N.A	
Odisha	1813355	12710591	14.27	13
Punjab	3415205	15024570	22.73	1
Rajasthan	3693900	19604497	18.84	6
Sikkim	37206	364218	10.22	17
Tamil Nadu	2759356	39137245	7.05	19
Tripura	266468	1294740	20.58	3
Uttar Pradesh	8285780	39748819	20.85	2
Uttarakhand	443633	5214288	8.51	18
West Bengal	N.A	N.A	N.A	
A & N Islands	N.A	N.A	N.A	
Chandigarh	9357	1575400	0.59	22
Delhi	96149	18325410	0.52	23
Puducherry	35935	1031750	3.48	21

Source: Ministry of Statistics and Programme Implementation, GoI

The above table speaks about the contribution of agriculture to the total Gross State Domestic Product of the respective states. Punjab (22.73%), Uttar Pradesh (20.85%), Tripura (20.58%), and Manipur (20.32%) are the leading states in terms of contribution of agriculture to their respective states' GDP, whereas states like Uttarakhand (8.51%), Maharashtra (6.67%), Tamil Nadu (7.05%), etc. fall in the category of states contributing less to their state GDP in terms of primary sector. The contribution of agriculture also gives us a clue that most of the states, where the contribution is more, are little bit less developed than the others.

#### MAJOR FINDINGS

- States like Manipur, Meghalaya, Nagaland, Mizoram etc show positive percentage growth in net sown area and total cropped area, on the other hand negative percentage growth is observed in states like Odisha, Jharkhand, Jammu & Kashmir, and West Bengal etc.
- Tripura and Gujarat are the leaders in percentage growth in cropping intensity, whereas states like Nagaland, Maharashtra, Sikkim, and Odisha delivered negative results.
- Chhattisgarh, Gujarat mapped up to the adoption of high yielding variety of rice production, whereas Jammu and Kashmir shows the highest negative growth.
- Kerala registered highest percentage growth in fertilizer consumption, whereas Odisha shows highest negative growth.

- Chandigarh, Delhi and Jammu & Kashmir are leading in percentage growth in terms of labour supply to agricultural sector, whereas Goa, and Kerala are the states which have diverted their labourers to non-agricultural sectors.
- In terms of food grains production most of the states registered positive growth led by Gujarat, Chhattisgarh, and Goa, but the states which are showing negative path include Kerala, Tamil Nadu, Karnataka, Mizoram, and Meghalaya.
- In case of yield of food grains, Bihar, Tamil Nadu, Chhattisgarh, and Maharashtra registered the highest percentage growth, whereas states like Andhra Pradesh, Goa, Manipur, Odisha, Himanchal Pradesh etc followed the negative path.
- In case of total value of output, Gujarat, Karnataka, Manipur, Nagaland, and Chhattisgarh show positive results, whereas Goa, Kerala, Manipur etc travelled towards negative growth.
- Tripura, Sikkim, Tamil Nadu, Jharkhand are leading states in positive percentage growth in terms of contribution to state GDP, whereas Punjab and Kerala are showing highest percentage negative trend of contribution from agriculture to state GDP.

### SUGGESTIONS AND CONCLUSION

The study clearly indicates the existence of high inter-state disparities in agricultural development in the country over the years. The disparities in agricultural development among the different states emanate from numerous factors including credit availability, monsoon, technology, topographical features, and historical, institutional, natural and socio-economic factors. The study suggests the policy makers to increase the government expenditure in agricultural infrastructure including irrigation, technology, crop varieties and credit facilities, and to focus on the underdeveloped regions for removing the disparities and achieving inclusive and sustainable agricultural development in the country. Besides there is a severe need of policy makers to intervene into the system by making suitable policies, focusing on the minimisation of the disparities in agricultural growth in and across the regions of the country. This doesn't mean decreasing the growth of faster growing states but to accelerate the growth of lower performing states. Innovative and efficient management of ground water is the need of hour in the areas of water deficiency. There is also a need to focus on small, minor irrigation projects and watershed facilities which are cheap and affordable considering the issue of irrigation. Farmers are to be facilitated by the local govt. through soil testing, dissemination of technology, knowledge and expertise to focus for better productivity and increased production. High rate of investment in crop research, infrastructure, market development and appropriate policy should be undertaken by the concerned authorities to enhance the agricultural production, thereby reducing the regional disparities in agricultural development in the country.

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