



STRUCTURAL CHANGE AND GROWTH OF AGRICULTURE IN UTTARAKHAND

Kailash Bharti Goswami

Ph.D. Scholar, Department of Economics, D.S.B. Campus, Kumaun University Nainital, Uttarakhand India

Padam S. Bisht

Professor, Department of Economics, D.S.B. Campus, Kumaun University Nainital, Uttarakhand India

ABSTRACT

KEYWORDS:

Structural Change, Agriculture, Uttarakhand Economy

Structural revolutionize indicates qualitative transformation of the economic systems through technological progress and organizational changes. It happens not only in domestic product but also in the shares of employment. Structural change contributes to pick up the pace economic growth with improvements in productivity. Economic development has been regarded as the course of structural transformation where the relative contribution of agriculture in national output falls and of industry and service sector rises. The study is carried out to find whether this pattern exists in the economy of Uttarakhand. The objective of the study is to examine the structural change and performance of agriculture sector in Uttarakhand. Uttarakhand is predominantly an agrarian state but it has accelerated the growth rates in industrial and service sector also. The selected indicators to find structural change are sectoral composition of output, sectoral labour shares and capital formation. The performance of agriculture is examined on the basis of indicators of agricultural development like yield of major crops, cropping intensity, irrigation intensity, density of tractors, and consumption of fertilizers. The main findings: the pattern of structural change in Uttarakhand is in tune with the national economy of India and agriculture sector needs more attention on the part of policymakers to provide incentives for new farm innovations.

1. INTRODUCTION

Structural revolutionize indicates qualitative transformation and progress of the economic systems, usually marked by technological progress and organizational changes. Technological factors, facts and institutions are all elements that put in to the process of structural change. The structural change is a course of combining economic growth with changing share of different sectors in gross domestic product (GDP) and labour force. It follows a sequence of shift from agriculture to industry and to services. There is a need for the countries to transform their structure, away from agriculture with low productivity of labour towards industrial activity with high productivity of labour. Every underdeveloped economy is characterized by bigger split of agriculture in domestic income, with development, the share of industrial sector increases and that of agriculture falls and as the level of development rises, the share of services segment increases. The structural swing and altering sectoral shares happen not only in domestic product but also in the shares of employment. With structural change and economic development, the

comparative importance of agriculture sector falls, along with rising share of secondary and tertiary sector. Such type of perceptions has lead to the dryness of the role of agriculture in the process of economic development. Uttarakhand economy, primarily an agrarian state has developed on every front, agriculturally and industrially. The present paper is an attempt to understand the structural change and performance of agriculture in Uttarakhand Economy.

2. REVIEW OF LITERATURE

The study of structural change is essential because economic growth is linked with structural change. This link may exist through industrialization or tertiarization, along with changes in labour shares. There is shift in the distribution of labour force from the low productivity sector or activities to higher productivity areas.

Modern reckoning of sectoral revolution originated with **Fisher (1939)** and **Clark (1940)**, who negotiate with sectoral shifts in the concerto of the labour force. However, they were almost certainly the first to deal with the process of reallocation of the factors of production in the economic

growth, and use the form of sectoral separation (primary, secondary & tertiary) which, in one way or another, is still with us these days. The most habitual events of economic structure are sectoral shares of the labour force. **Kuznets (1966)** inspect these three categories in extra characteristic, added the breakdown of sectoral shares of GDP, and was able to empirically reveal that growth is brought about by changes in sectoral composition. He provided the chronological empires and hypothetical outline for the structural change, although he used no econometric techniques. Chronological pattern of economic development of today's developed countries has, no doubt, followed a common pattern and this is well documented by **Kuznets (1966)** and others. The share of agriculture has seen a steady decline in total output while the industry sector registered a boost for a significantly long period, and then it has shown a decline. In addition, the share of services has progressively increased all the way through, but the velocity of increase seems to have accelerated in the second half of the twentieth century, the period during which industry has seen a decline in its share and, therefore, is often described as a period of "deindustrialization" in the developed countries. The timing of the different phases of structural changes and momentum of such changes has, of course, being different between unlike countries. In the "pre-modern" era, according to **Kuznets's** appraisal finished at different points of time during the nineteenth century in different countries, agriculture accounted for a half to two-thirds of the total output in these countries. It seems to have taken about 75 to 100 years for this share to turn down to about one-fourth in the case of most European countries, though like shift was achieved more rapidly in North America and Japan. Recent research by **Buera and Kaboski (2012)**, among others, shows for several countries that structural change involves three separate patterns: a turn down in agriculture, an increase in services, and a hump-shaped pattern in manufacturing labor shares. **Aggarwal & Moudgil (2015)** examine the structural change & growth of agriculture in Haryana, the study observes that there is direct relationship between growth and structural change. The study reveals that this structural shift in Haryana is at faster rate as compare to Indian economy. The result shows that in the share of primary sector in SGDP of Haryana there is continuous decline since 1990. **Agarwal & Ritika (2016)** also examine Structural Changes in the South Asian Economies, and their analysis and conclusion shows that the primary sector's growth rate has been generally low for these economies while there is stagnation or poor performance by the secondary sector but, the tertiary sector has become the predominant sector with structural shifts. In his research **Agarwal** states that relationship between growth rates and structural transformation does not get statistical support in any of the economies.

Objectives of the study

- To study the structural transformation in the economy of Uttarakhand
- To review the performance of agriculture sector in Uttarakhand
- To categorize most important factors accountable for the performance of agriculture sector in Uttarakhand.

3. RESEARCH METHODOLOGY

The stylized set of information is that structural change is absolutely related to economic growth and with development, the share of farming falls, of production and service sector rises. The study is carried out to find whether this pattern be present in the economy of Uttarakhand. The selected indicators of structural revolutionize are sectoral composition of amount produced, sectoral labour shares, capital creation. The performance of agriculture is examined on the source of indicators of agricultural development like yield of major crops, consumption of fertilizers, density of tractors, cropping intensity, irrigation intensity, consumption of fertilizers etc. Secondary data from Economic Surveys, statistical diaries and statistical abstracts of Uttarakhand for various years have been used. Statistical averages, percentages, growth rates and compound annual growth rates have been calculated.

4. PROFILE OF UTTARAKHAND

Uttarakhand hill economy is in and huge characterized as a subsistence agricultural economy with an unstable industrial base led to unemployment and large-scale outmigration, mainly in search of livelihood and employment. Former it was a part of the Uttar Pradesh categorized among the most backward regions of the country. During the period of last eighteen years, being an autonomous state the Uttarakhand was achieved a barely credible achievement in the aspects of socio-economic development. However, in spite of the accessibility of various natural resources and various development efforts undertaken in the past, several regions of the state have remained underdeveloped in nearly all economic and social aspects. In 2014-15, Uttarakhand exports stood at Rs. 52252.57 Million as compared to Rs. 30042.56 Million in 2013-14. It seems to be a high jump in the exports of Uttarakhand during this period. Exports to foreign countries increased by 194.83 percent and to other States by 64.52 percent. Singapore is Uttarakhand largest export partner, with an average share of 14.98 per cent in Uttarakhand total export during the last two years. The U.S.A is the second largest importer (13.25%), followed by the Nepal and Russia. Uttarakhand is being developed as an energy state to tap the hydropower electric potential of over 25000MW.

Uttarakhand economy mainly relies on tourism industry and the state is the 2nd fastest growing state in India. Its GSDP growth (at constant price) was 2004-05 to Rs. 10852875 Lac in 2011-12 and rises to Rs. 14228284 Lac in 2015-16. Like most of India, agriculture is one of the most significant sectors of the economy of state. The per capita income in 2015-16 was Rs. 171663. The contribution of primary, secondary and tertiary sector to states gross value added (GVA) in 2015-16 were 11.54%, 51.24% and 37.22 % respectively. The share of primary sector falls to 11.54% in 2015-16 from 28.22% in 2000-01, while the share of industrial sector goes on increasing year by year, which shows structural shift in the state economy. The share of tertiary sector in the economy was 49.96% in 2000-01 and it declines to 37.22 percent in 2015-16 as shown in below table. The varying sectoral composition of the three main sectors confirms the structural change.

Year		Primary Sector	Secondary Sector	Tertiary Sector
Base Year 1999-2000	2000-01	28.22	21.82	49.96
	2001-02	25.44	23.44	51.12
	2002-03	24.10	25.89	50.01
	2003-04	24.30	25.40	50.30
	2004-05	23.48	27.02	49.50
Base Year 2004-05	2005-06	20.25	30.03	49.72
	2006-07	18.55	32.12	49.33
	2007-08	16.02	33.68	50.30
	2008-09	13.58	33.87	52.55
	2009-10	12.44	34.52	53.04
Base Year 2011-12	2010-11	11.92	35.64	52.44
	2011-12	13.97	52.03	34.00
	2012-13	13.20	53.16	33.64
	2013-14	13.04	52.20	34.76
	2014-15	11.74	52.18	36.08
	2015-16	11.54	51.24	37.22

Source: Statistical Diary & Statistical Abstracts Uttarakhand, (various years)

The state has promoted designed industrial development through setting up of Industrial Estates both by the State Infrastructure & Industrial Development Corporation of Uttarakhand (SIIDCUL) and the private sector. The total number of factories registered under the Act was 2987 in 2014-15 employing 374861 persons of which 354985 were workers. In Uttarakhand state, majority of the industries were situated in Udham Singh Nagar, Haridwar, Dehradun and Nainital. More than 75 per cent industrial outputs come from two districts of US Nagar and Haridwar. According to the department of industrial policy and promotion (DIPP), the cumulative FDI inflows, during April 2000 to June 2018, stood at around US\$ dollar 680 million

The primary sector shows negative growth of -4.85%, -1.38, -4.59% and -5.05% in 2000-01, 2005-06, 2008-09 and 2014-15 respectively. In tune with the Indian economy, Uttarakhand economy experienced structural change bypassing the required and expected high growth of secondary sector and tertiary sector. The yearly growth for the primary sector kept fluctuating between -5.05 percent to 8.54 percent (Table2), the analysis of these sectors in the state of Uttarakhand points to the faster economic growth along with structural change.

Year		Primary Sector	Secondary Sector	Tertiary Sector
Base Year 1999-2000	2000-01	5.03	30.14	9.52
	2001-02	-4.85	13.37	7.96
	2002-03	4.09	21.39	7.57
	2003-04	8.54	5.61	8.22
	2004-05	4.94	26.60	10.02
Base Year 2004-05	2005-06	-1.38	27.09	14.84
	2006-07	4.01	21.47	12.72
	2007-08	2.06	23.86	20.41
	2008-09	-4.59	13.32	17.70
	2009-10	8.34	20.41	19.19
Base Year 2011-12	2010-11	5.33	13.56	8.41
	2011-12	4.22	12.10	8.67
	2012-13	1.38	8.91	6.89
	2013-14	6.46	6.72	11.01
	2014-15	-5.05	4.37	10.70
	2015-16	0.59	9.44	6.53

Source: Statistical Diary & Statistical Abstracts, Uttarakhand, (various years)

Table 4.3
Per Capita Net State Domestic Product at Factor Cost (Current Prices)

Year	Uttarakhand
2009-10	62757
2010-11	73819
2011-12	100305
2012-13	113610
2013-14	126247
2014-15	135881
2015-16	146826

Source: Central Statistics Office (CSO)

5. PERFORMANCE OF AGRICULTURE IN UTTARAKHAND

Table 5.1 indicates unstable growth pattern of agriculture and allied sectors. From 2001-02 to 2003-04 the CAGR was 4.02% and from 2001-02 to 2015-16 this was 7.52%. Agriculture experienced negative growth rate for many years in a span of 16 years while forestry, fishing has positive growth rates in general. The mining & quarrying sector shows highest growth rate (CAGR) of 20.92% from 2000-01 to 2015-16.

The percentage share of agriculture and animal husbandry in 2000-01 was 27.10% and it falls to 13.34% in 2006-07 and again falls to 7.05% in 2015-16. The contribution of forestry

& logging, Fishing and mining & quarrying sector to states gross value added (GVA) in 2015-16 were 2.12%, 0.03% and 1.25 % respectively. The share of forestry & logging shows decreasing trend while fishing maintains stable share from 2006 to 2016. (Table 5.2)

The total share of primary sector was 30.06%, 20.22%, 13.41% and 10.41% in 2000-01, 2006-07, 2011-12 and 2015-16 respectively which shows the structural shift towards other sectors. The shift is very progressive for state economy.

Table 5.1
Growth Rate of Primary Sector and Its Sub-Sectors Uttarakhand (%)

Economic Activity	2001-02 to 2003-04	2004-05 to 2010-11	2011-12 To 2015-16	2000-01 to 2015-16
Agriculture & Animal Husbandry	4.02	10.64	3.43	7.52
Forestry & Logging	6.36	12.00	4.24	16.91
Fishing	3.40	16.28	8.21	12.48
Mining & Quarrying	36.04	12.90	4.86	20.92
Primary	5.38	11.12	3.77	9.46
NSDP	8.74	18.34	9.08	16.94

Source: Calculated from NSDP Data

Table 5.2
Percentage Share of Primary Sector and Its Sub-Sectors Uttarakhand (%)

Economic Activity	2000-01	2006-07	2011-12	2015-16
Agriculture & Animal Husbandry	27.10	13.34	9.20	7.05
Forestry & Logging	2.18	5.62	2.66	2.12
Fishing	0.05	0.03	0.03	0.03
Mining & Quarrying	0.73	1.23	1.52	1.25
Primary	30.06	20.22	13.41	10.45

Source: Calculated from NSDP Data

Table 5.3 shows the area under major crops in Uttarakhand and average production of these agriculture commodities. Area under principal crops of the state like wheat, rice, maize, barely, pulses, sugarcane etc has decreased multiple times during the study period. The area under rice falls by nearly 8%, 9% for wheat, for maize it is decreased by 33%, 29% for barely while area reduced by 18% for sugarcane from 2000-01 to 2015-16. The reason behind is that the major population of Uttarakhand are shifting from farming sector to other sectors of economy. The average production of rice,

wheat, total pulses and potato rises in the given period but the average production for sugarcane, maize barley was not stable & these shows fluctuating trend.

The total production of agricultural commodities also shows same trend during the study period. The total production of rice, wheat and total pulses was 641892 metric ton, 790360 metric ton and 45742 metric ton respectively in 2015-16, which shows an increase in production in given period, while production of some commodities falls like barely, maize mandua and sugarcane as shown in table 5.4.

Commodity	Year							
	2000-01		2006-07		2011-12		2015-16	
	Area	Avg.	Area	Avg.	Area	Avg.	Area	Avg.
Rice	288607	2.04	283585	2.01	274999	2.14	265206	2.42
Wheat	377340	1.88	377870	2.10	355549	2.43	342650	2.31
Barely	25797	0.98	24080	1.15	20712	1.26	18367	0.98
Maize	33530	1.44	27244	1.32	25519	1.50	22166	1.72
Mandua	127733	1.27	125640	1.36	114511	1.40	111223	1.23
Total Pulses	53850	0.54	52838	0.65	51991	0.84	54920	0.83
Oil Seeds	25070	0.58	28261	0.82	25592	1.06	27603	1.08
Sugarcane	116478	58.65	118869	61.14	104210	66.88	95538	59.20
Potato	82757	7.94	53969	9.71	62956	9.91	358244	13.84

Commodity	Year			
	2000-01	2006-07	2011-12	2015-16
Rice	588652	571336	589764	641892
Wheat	711036	796548	864836	790360
Barely	25271	27699	26160	18061
Maize	48401	35981	38378	38208
Mandua	162286	171181	160034	161231
Total Pulses	28993	34189	43881	45742
Oil Seeds	14525	23236	27163	29734
Sugarcane	6831440	7267233	6344504	5656014
Potato	656945	524244	624121	634212

Table 5.5 depicts the gross and net cropped and irrigated area in Uttarakhand, in 2000-01 the total gross cropped area was 1225556 Hectare, which decreased to 1096834 Hectare in 2014-15 and there was nearly 10% fall in the gross cropped area while the gross irrigated area increased by nearly 1% during the same period. The net cropped and irrigated area

both decreased during the study period. Uttarakhand has a tremendous irrigation infrastructure. Irrigation in Uttarakhand uses water either from underground or from surface through canals. Currently in Uttarakhand, the most important technology for groundwater irrigation is the use of tube-wells with pump. Besides farming, dairy farming and horticulture is also essential part of the rural economy.

Year	Net area sown	Gross area sown	Net irrigated area	Gross irrigated area
2000-01	769944	1225556	343608	537439
2001-02	776191	1221310	345938	538690
2002-03	758789	1211632	340761	532225
2003-04	760726	1221510	343608	537439
2004-05	766730	1234539	345224	549345
2005-06	767571	1212367	343412	549381
2006-07	765150	1212309	345020	554013
2007-08	755035	1187409	340925	554461
2008-09	753711	1188462	340129	569769
2009-10	741099	1166380	338493	566599
2010-11	726537	1169697	336136	561733
2011-12	714189	1131804	339397	554837
2012-13	706090	1124404	337566	553928
2013-14	701030	1099185	328104	544084
2014-15	700171	1096834	329964	542483

Source: Sankhyakiya (Statistical) Diary, Uttarakhand (2000-01 to 2015-16)

Fertilizers	Years			
	2000-01	2006-07	2011-12	2015-16
Nitrogen	87833	108121	123246	170997
Phosphorus	25698	25124	29329	23291
Potash	11270	8966	9930	6798
Total	124801	142211	162505	201086

The above table shows the consumption of fertilizers (NPK) in Uttarakhand. The trend shows that the consumption of Nitrogen increases to 170997 ton in 2015-16 from 87833

ton in 2000-01, while the consumption of Phosphorus and potash decreases in the same period.

	Factors	2001-02 to 2003-04	2004-05 to 2010-11	2011-12 To 2015-16	2000-01 to 2015-16
1	Cropping Intensity	0.22	0.06	0.06	0.06
2	% of Net Irrigated to Net Sown Area	0.84	0.78	0.84	0.39
3	Fertilizers Consumption	-0.30	3.88	4.34	3.02
4	No. of Tractors	2.10	3.66	4.04	6.63
5	Consumption of Electricity in Agriculture	11.13	-6.83	-15.38	-3.22
6	Roads Per 1000 sq. km	6.76	15.32	22.34	18.33
7	Secondary Sector Income	12.13	21.08	8.78	22.92
8	Tertiary Sector Income	9.17	19.65	11.03	15.94

Source: Calculated from the data from Statistical Diaries & Statistical Abstracts (various years)

Table 5.7 shows the factors affecting the income of agriculture sector in Uttarakhand, the consumption of electricity increases from 2001 to 2004 by 11.13% but, it gradually decreases in others years. This shows the structural shift in the state economy. The road connectivity to rural economy increases year by year and this is due to the expansion in industrial sector and establishments of tourists place in hills of the Uttarakhand. The growth of tractors also increases by which the production of different agriculture commodities increases; this is one of the positive sign for Uttarakhand agriculture sector.

6. CONCLUSIONS

Uttarakhand economy has undergone the course of structural alteration at a faster rate, leading to higher growth rates of the various sectors. But the declining share of agriculture in SGDP without a corresponding fall in the labour share is a matter of concern and it needs serious attention on the part of policy makers.

Note: This paper was presented in International Conference, organized by Centre for Humanities and cultural studies Kalyan (W), Thane, held at Maulana Abdul Kalam Azad Research Centre, Aurangbad, Maharashtra by Kailash Bharti Goswami on 17th February 2018.

REFERENCES

1. Aggarwal, P.R. & Moudgil, Anita (2015), "Structural change and growth of agriculture in Haryana", *International Journal of Applied Research* 2015; 1(13): pp 133-139
2. Agarwal, M.K. and Ritika (2016), "Growth and Structural Changes in the South Asian Economies of India, Nepal and Sri Lanka", *The Journal of Development and Administrative Studies (JODAS)*, Vol. 24 (1-2), pp. 39-62

3. Banga Rashmi *critical Issues in India's sevice led Growth. Working*, 171. www.icrier.org
4. Buera, Francisco J. and Joseph P. Kaboski, 2012. "Scale and the Origins of Structural Change" *Journal of Economic Theory*, 147, 684-712
5. Bhowmik, Rita. *Role of services sector in Indian economy: An input output Analysis*, Artha VI jnana
6. Clark Colin. *The Conditions of Economic Progress*. Macmillan, London, 1940.
7. Chenery Hollis, Moshe Syrquin. *Patterns of Development (1950-1970)*. Oxford University Press, London, 1975.
8. Chenery Hollis *Patterns of Industrial Growth American Economic Review* 1960; 50:624-654. 6.
9. Cortuk Orcan, Nirvikar Singh. *Structural Change and Growth in India Economics Letters* 2011; 110:178-181.
10. Kuznets, S. (1971), "Economic Growth of Nations: Total Output and Production Structure", Cambridge, Harvard University Press, pp. 198
11. Kuznets, S. (1966) "Modern Economic Growth: Rate, Structure & Spread, New Heaven", Yale University Press, pp. 340-342
12. Fisher, AGP (1939), "Production of Primary, Secondary and Tertiary sector", *Economic record*, Vol. 15, pp. 24-38