



## Structural Transformations in Agrarian Economy of Punjab

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### ABSTRACT

*Punjab economy is witnessing several structural transformations during the past thirty years. One of the major structural transformations is reduction in share and growth rate of the primary sector in general and the agricultural and allied sectors in particular in GSDP of the state, while the performance of other sectors such as secondary and tertiary sectors was reasonably good in comparison with the primary sector. Therefore, an attempt has been made to comprehend some of the factors responsible for deceleration in growth of agricultural sector of the state. The study points that cropping pattern followed in Punjab is highly imbalanced in favour of wheat and paddy along with stagnation in productivity of these crops which also reflects in reduction in contribution of the state in wheat and paddy to central pool. Further, highly unequal ownership of land holdings coupled with overcapitalisation in farm machinery and over use of fertilizers and pesticides also lead to structural transformation in the state. Finally, the study concludes that there is need to shift the agricultural production pattern towards demand driven crops such as fruits and vegetables along with better integration of primary sector with secondary and tertiary sectors.*

**Key words:** Agricultural development, Agrarian crisis, Over capitalisation

**JEL Classification:** Q10, Q15,

### INTRODUCTION

It is a well known fact that Punjab has led India's agricultural performance over the last three decades due to the impressive growth rates achieved by its agricultural production which still acts as role model for other regions (Chand, 2008). But, Punjab which held a pride place among the Indian states for its outstanding achievements in agriculture after the introduction of green revolution in the mid 1960's is witnessing

many structural transformations primarily due to the reduction of the share of the agriculture sector in the state's economy. The state which was once called as 'food bowl' of India is witnessing a decline in the growth rate of agriculture. The decline in agricultural sector of the state is so severe that it is also manifested in decline of per capita income of the state. The state which attained 1<sup>st</sup> position in terms of per capita income during 1980-81 among fifteen major states of India slipped to fifth ranking during 2010-11 (RBI, 2013). Thus, deceleration of economic

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growth of the Punjab economy in general and agriculture sector in particular has increased the crisis of capitalistic path of economic development especially in the liberalisation and globalisation era (Gill and Singh, 2005).

In a developing country like India, agriculture sector has a large impact on the entire economy, especially the agro-industries that supply current and capital inputs and that process agricultural output. The emergence of large market surpluses in agriculture stimulates an unprecedented increase in trade and transport. The rapid rise in the per capita income of the rural and urban population widens the market for consumption goods and services. Thus, by raising the income of a large proportion of rural workers, rapid agricultural growth not only made a deep dent in rural poverty, but also led to development of other sectors of the economy (Bhalla, 1995). The performance of agriculture sector also affects the growth prospects of the other sectors of the economy directly and indirectly due to inter-connections between sectors (Singh, 2010). Lewis theory of growth based on the process of structural transformation has also outlined the importance of the agriculture sector as it plays an important role through the supply of surplus resources and workforce for the rapid progress of other sectors, especially industrial, to transform the economy from a low productivity to a higher productivity one (Singh and Singh, 2002). Therefore, in the context of Punjab, declining growth in productivity of agricultural sector is a cause of concern for the policy makers. Thus, it becomes imperative to study the structural transformations that have taken place in agrarian economy and identification

of some of the plausible factors that contribute towards deceleration in agricultural growth of the state.

#### **DATA AND METHODOLOGY**

The study is carried out by using the secondary data sources. The various sources of the secondary data used are: Statistical Abstract of Punjab, Agricultural Statistics at a Glance, Report of Environment Statistics of Punjab, RBI's Handbook of Statistics on Indian Economy etc. Online data from [www.indiastat.com](http://www.indiastat.com) was also compiled for the purpose of analysis.

#### **RESULTS AND DISCUSSION**

##### **Sectoral Distribution of Gross State Domestic Product (GSDP)**

The character of Punjab economy during 1980s was fundamentally agrarian. The contribution of primary sector in Gross State Domestic Product (GSDP) was 40 per cent each in 1980-81 and 1990-91. But, it came down to 34.55 per cent during 2000-01 and about 24 per cent during 2010-11. In primary sector, share of agricultural sector in GSDP had drastically declined from 29.11 per cent in 1980-81 to 15.09 per cent in 2010-11. The growth in agriculture sector was the least as compared to all others sub-sectors of the economy during 1991-2010. The share of livestock sector in GSDP was 8.42 per cent in 1980-81, which increased to around 9.5 per cent each during 1990-91 and 2000-01. But, it declined to 7.55 per cent during 2010-11. The share of forestry and logging in GSDP was 2.45 per cent in 1980-81. After that, it declined to 1.6 per cent in 1990-91, 1.46 per cent in 2000-01 and only about one per cent in 2010-11. Fishing sector in Punjab had witnessed improvement as its share in GSDP



**TABLE 1: SECTORAL DISTRIBUTION AND GROWTH RATE OF STATE DOMESTIC PRODUCT (IN PER CENT)**

Sectors	(At 2004-05 prices)				
	1980-81	1990-91	2000-01	2010-11	Growth rate
Agriculture	29.11	28.83	23.27	15.09	2.29
Livestock	8.42	9.5	9.59	7.55	4.76
Forestry and logging	2.45	1.6	1.46	0.98	1.83
Fishing	0.03	0.07	0.22	0.24	14.83
Mining and quarrying	0.01	0.02	-	0.02	5.71
<b>Sub-total of primary</b>	<b>40.02</b>	<b>40.03</b>	<b>34.55</b>	<b>23.88</b>	<b>2.95</b>
Manufacturing	8.46	12.87	16.44	20.59	7.26
Electricity, gas and water supply	1.92	2.95	3.09	2.85	6.04
Construction	6.7	4.74	5.56	7.33	5.78
<b>Sub- total of secondary</b>	<b>17.07</b>	<b>20.55</b>	<b>25.08</b>	<b>30.77</b>	<b>6.68</b>
Trade, hotels and restaurants	13.37	11.35	11.69	11.46	4.24
Transport, storage and communication	2.04	2.67	4.38	6.64	9.73
Banking and insurance	1.45	2.89	4.28	7.69	9.98
Real estate, ownership of dwellings	9.24	7.36	5.91	4.84	2.39
Public administration	3.11	3.93	4.64	4.84	6.87
Other services and sanitary services	13.7	11.23	9.46	9.88	3.17
<b>Sub- total of tertiary</b>	<b>42.91</b>	<b>39.42</b>	<b>40.37</b>	<b>45.35</b>	<b>4.87</b>

Source: *Statistical Abstract of Punjab (Various Issues) and www.indiastat.com.*

had improved from 0.03 per cent in 1980-81 to 0.24 per cent in 2010-11 at a very impressive growth rate of around 15 per cent. In sharp contrast to primary sector, all sub-sectors of secondary sector have increased their share in GSDP. The share of manufacturing; electricity, gas and water supply and construction in GSDP increased from 8.46 per cent, 1.92 per cent, 6.7 per cent, respectively in 1980-81 to 20.6 per cent, 2.8 per cent, 7.3 per cent respectively in 2010-11. Among all secondary sub-sectors, growth rate during 1980-81 to 2010-11 was highest in manufacturing (7.26 per cent) followed by electricity, gas and water supply (6.04 per cent) and construction (5.78 per cent). The improvement in share of tertiary sector in GSDP was only marginal as its share increased from 42.9 per cent during 1980-81

to 45.35 percent during 2010-11. In service sector, share of trade, hotels and restaurants was largest (11.46 per cent) followed by other services and sanitary services (9.88 per cent) banking and insurance (7.69 per cent) transport, storage and communication (6.64 per cent), real estate, ownership of dwellings (4.84 percent) and public administration (4.84 per cent) during the 2010-11. Among all the components of tertiary sector, trade, hotel and restaurant; real estate and ownership of dwellings; and other services and sanitary services had witnessed a decline in share in GSDP. The share of tertiary sector components such as transport, storage and communication, banking and insurance and public administration had increased in GSDP during 1980-81 to 2010-11. From above analysis, it is clear that the structure of Punjab



economy has systematically changed from agrarian sector to more diversified industrial and tertiary sectors. The worst performance was of agricultural sector as its growth rate was least among all the sub sectors of the economy during 1980-81 to 2010-11 (Table 1).

### Structure of Work Force

The structure of main work force in Punjab has changed over the period of time (1981 to 2011). The main workers are those workers who worked for more than six months in a year (Census of India, 2011). The work force engaged in agriculture (cultivators and labourers) was 58.02 per cent in 1981, which declined to 56.07 per cent during 1991, 38.94 per cent during 2001 and further declined to 35.17 per cent during 2011 census respectively. Industrial workers were also declined according to 1981 to 2011 census data. During 1981, 13.50 per cent workers were engaged in industrial sector, which declined to 12.28 per cent in 1991, 3.66 per cent in 2001 and 3.56 per cent during 2011. The work force increased in 'other sectors'. All workers who have been engaged in some economic activity during the last one

**TABLE 2: STRUCTURE OF WORK FORCE OF MAIN WORKERS IN PUNJAB**

Workers	1981	1991	2001	2011
Cultivators	1767286 (35.86)	1917210 (31.44)	2065067 (22.62)	1803860 (21.35)
Agriculture labour	1092225 (22.16)	1502123 (24.63)	1489861 (16.32)	1168021 (13.82)
Industrial workers	665442 (13.50)	749136 (12.28)	333770 (3.66)	300660 (3.56)
Other workers	1402806 (28.47)	1929905 (31.65)	5238776 (57.40)	5178395 (61.28)
Total workers	4927759 (100.00)	6098374 (100.00)	9127474 (100.00)	8450936 (100.00)

Source: Gill and Singh, 2005 and Census of India, 2011.

year, but are not cultivators, agricultural labourers or in household industry are classified as 'Other Workers (OW)' in Census of India, 2011. The type of workers that come under this category include all government servants, municipal employees, teachers, factory workers, plantation workers, those engaged in trade, commerce, business, transport, banking, mining, construction, political or social work, priests, entertainment artists etc. In 1981, 28.47 percent workers were in other workers category, which increased to 31.65 percent in 1991, 57.40 percent in 2001 and 61.28 percent during 2011. The above analysis shows that the work force increased in 'other sectors', while the major two sectors (agriculture and industrial sectors) had witnessed a decline in work force (Table 2).

### Shift in Cropping Pattern

The shift in cropping pattern is given in Table 3. This table shows that about 41.58 per cent of the gross cropped area (GCA) in 1980-81 was under wheat which increased

**TABLE 3: SHIFT IN CROPPING PATTERN IN PUNJAB**

Crops	(Per cent)			
	1980-81	1990-91	2000-01	2010-11
Rice	17.49	26.86	32.89	35.9
Wheat	41.58	43.63	42.92	44.53
Total cereals	66.73	73.65	78.37	82.38
Pulses	5.04	1.91	0.68	0.25
Total food grains	71.77	75.55	79.05	82.63
Oilseeds	3.52	1.39	1.08	0.7
Cotton	9.6	9.34	5.97	6.13
Sugarcane	1.05	1.35	1.52	0.89
Potatoes	0.59	0.31	0.76	0.81
Fruits and vegetables	1.38	1.65	1.82	2.19
Cropping intensity	161.37	177.86	186.85	189.56

Source: Statistical Abstract of Punjab, 2012.



to 44.53 per cent during 2010-11. Rice, which occupied around 17.49 per cent of the GCA in 1980-81 increased to 26.86 per cent in 1990-91 and 32.89 per cent during 2000-01. It further rose to around 35.90 per cent in 2010-11. The GCA under total cereals also increased from 66.73 per cent in 1980-81, to 73.65 per cent in 1990-91, 78.37 percent in 2000-01 and 82.38 percent during 2010-11. The percentage of GCA under food grains also increased from 71.77 per cent to 82.63 per cent during 1980-81 to 2010-11. The area under cotton was 9.60 per cent in 1980-81 and 9.34 per cent during 1990-91. After mid 1990s, the area under cotton has been adversely affected due to inclement weather and pest attack, its share in GCA went down to 5.97 per cent in 2000-01. With introduction of Bt varieties in 2007-08, area under cotton started increasing. It increased to 6.13 per cent during 2010-11. Area under sugarcane decreased from 1.05 per cent to 0.89 per cent during 1980-81 to 2010-11, while area under potatoes marginally increased from 0.59 per cent to 0.81 per cent during same period. Respective share of pulses and oilseeds in GCA had recorded a sharp decline from 5.04 per cent and 3.52 per cent in 1980-81 to 0.25 per cent and 0.70 per cent in 2010-11. The GCA under fruits and vegetables increased slightly from 1.38 per cent to 2.19 per cent during 1980-81 and 2010-11. Thus, cropping intensity increased from 161.37 per cent to 189.56 per cent during 1980-81 and 2010-11 (Table 3). This clearly indicates imbalance in the cropping pattern due to two main cereal crops- rice and wheat. This happened due to better relative profitability of these crops with minimum production and marketing risk as

compared to other crops (Singh *et al.* 2012).  
**Area, Production and Yield of Principal Crops**

Area, production and yield of principal crops are given in Table 4. In wheat and rice, growth in area, production and yield had declined although there was small improvement in yield of rice during 2000's. Area under wheat increased from 2.81 million hectare to 3.51 million hectare, production increased from 7.68 million tonnes to 16.47 million tones and yield increased from 2730 kg/ha to 4693 kg/ha from 1980-81 to 2010-11. The growth rate of area, production and yield shows stagnation in 1990s and 2000s. The growth rate of area of wheat was 1.26 percent during 1980's, which declined to 0.27 percent during 1990's with marginal increased to 0.23 percent during 2000's. The area, production and yield of rice also showed almost similar trend as wheat crop. The area under rice increased from 1.18 million hectare to 2.83 million hectare during 1980's to 2000's, while production increased from 3.22 million tonnes to 10.84 million tonnes and yield increased from 27.36 qtl/ha to 38.28 qtl/ha during 1980's to 2000's. Further, expansion of area under rice was also not happening as growth rate of area under rice declined from 5.39 per cent during 1980's to 2.48 per cent during 1990's and 1.01 per cent during 2000s. The growth rate of rice production also declined from 6.74 per cent in 1980's to 2.50 per cent in 1990's and 2.39 per cent during 2000's. The growth of yield of rice declined from 1.28 per cent to 0.02 per cent during 1980's to 1990's with marginal improvement to 1.36 per cent during 2000's. Area, production and yield of all food grains



increased significantly during 1980's, but during 1990's and 2000's, all food grain crops witnessed stagnation in area, production and productivity. It was evident from the fact that area under food grains increased from 4.84 million hectare during 1980's to 6.51 million hectare during 2010-11, while production increased from 11.90 million tonnes to 28.39 million tonnes and yield increased from 2458 kg/ha to 4364 kg/ha during 1980's to 2000's. However, growth trend of food grain shows that growth in area under food grains declined from 1.58 per cent during 1980's to 0.73 per cent during 1990's and to 0.50 per cent during 2000's. The growth rate in production

### Contribution of Wheat and Rice to Central Pool

The contribution of wheat and rice to the central pool is given in Table 5. This table shows that the state contributed 45.3 per cent of rice to central pool in 1980-81, which declined to 41 per cent in 1990-91, 33.3 per cent in 2000-01 and 25.3 per cent in 2010-11 but the decline in the share of wheat was much sharper than of rice because Punjab contributed 73 per cent wheat to central pool in 1980-81 which declined continuously to 61 per cent in 1990-91 and 45.4 per cent in 2010-11. Decline in share of Punjab in wheat and rice to the central pool shows that contribution

**TABLE 4: AREA, PRODUCTION AND YIELD OF PRINCIPAL CROPS IN PUNJAB**

(Area in Million Ha, Production in Million Tonnes and Yield in Kg/Ha)

Particular	1980-81	1989-90	CAGR	1990-91	1999-00	CAGR	2000-01	2010-11	CAGR
<b>Wheat</b>									
Area	2.81	3.25	1.26	3.27	3.39	0.27	3.41	3.51	0.38
Production	7.68	11.68	4.3	12.16	15.91	2.26	15.55	16.47	0.61
Yield	2730	3593	3	3715	4696	1.98	4563	4693	0.23
<b>Rice</b>									
Area	1.18	1.91	5.39	2.02	2.6	2.48	2.61	2.83	1.01
Production	3.22	6.7	6.74	6.54	8.72	2.5	9.15	10.84	2.39
Yield	2736	3510	1.28	3229	3347	0.02	3506	3828	1.36
<b>Food grains</b>									
Area	4.84	5.62	1.58	5.75	6.26	0.73	6.28	6.51	0.5
Production	11.9	19.03	4.52	19.3	25.2	2.22	25.32	27.87	1.28
Yield	2458	3386	2.9	3356	4028	1.48	4032	4280	0.78

Source: *Agricultural Statistics at a Glance, 2012*

declined from 4.52 per cent during 1980's to 2.22 per cent during 1990's and 1.28 per cent during 2000's. Growth rate yield of food grains declined from 2.90 per cent, to 1.48 per cent and to 0.78 per cent during 1980's, 1990's and 2000's respectively. Thus, Table 4 clearly shows the stagnation in productivity of all food grain crops in Punjab.

**TABLE 5: CONTRIBUTION OF PUNJAB IN RICE AND WHEAT TO CENTRAL POOL**

Year	Rice		Wheat	
	Contribution to central pool (lakh tonne)	% share	Contribution to central pool (lakh tonne)	% share
1980-81	25.2	45.3	42.8	73
1990-91	48.2	41	67.5	61
2000-01	69.4	33.3	94.2	57.6
2010-11	86.3	25.3	102.1	45.4

Source: *Statistical Abstract of Punjab, 2012*



of other states in central pool has increased in comparison with Punjab.

### Pattern of Operational Holdings

Pattern of operational holding is depicted in Table 6. It shows that there is unequal distribution of operational holdings among

different farmer categories. In 1980-81, the proportion of small and marginal farmers in the state was about 39 per cent, while that of semi-medium, medium and large farmers was 28.18 per cent, 25.1 per cent and 7.25 per cent respectively. Thus, around 39 per

**TABLE 6: NUMBER, AREA AND AVERAGE SIZE OF OPERATIONAL HOLDINGS IN PUNJAB**

Year	Units	(No. of holdings in '000 and area in '000 ha)					
		Marginal	Small	Semi Medium	Medium	Large	All
1980-81*	No.	198.06 (19.42)	199.37 (19.55)	287.42 (28.18)	261.2 (25.16)	73.94 (7.25)	1019.99 (100.00)
	A	118.23 (3.04)	280.9 (7.22)	790.86 (20.32)	1565.7 (40.22)	1136.8 (29.20)	3892.49 (100.00)
	ASLH	0.6	1.41	2.75	5.99	15.37	3.82
1990-91*	No.	295.67 (26.47)	203.84 (18.25)	288.79 (25.86)	261.48 (23.41)	67.17 (6.01)	1116.95 (100.00)
	A	164.22 (4.07)	328.22 (8.04)	841.54 (20.87)	1621.81 (40.22)	1076.89 (26.76)	4032.68 (100.00)
	ASLH	0.56	1.61	2.91	6.2	16.03	3.61
1995-96**	No.	203.88 (18.65)	183.45 (16.78)	320.34 (29.31)	305.79 (27.98)	79.61 (7.28)	1093.07 (100.00)
	A	122.37 (2.95)	239.83 (5.78)	832.73 (20.08)	1753.9 (42.29)	1198.2 (28.89)	4147.03 (100.00)
	ASLH	0.6	1.31	2.6	5.74	15.05	3.79
2000-01**	No.	122.76 (12.31)	173.07 (17.35)	328.23 (32.91)	300.95 (30.17)	72.36 (7.26)	997.37 (100.00)
	A	77.52 (1.93)	241.99 (6.02)	876.44 (21.79)	1730.7 (43.03)	1095.6 (27.24)	4022.25 (100.00)
	ASLH	0.63	1.4	2.67	5.75	15.14	4.03
2005-06**	No.	134.76 (13.42)	183.06 (18.22)	319.93 (31.85)	295.75 (29.44)	70.96 (7.06)	1004.47 (100.00)
	A	83.34 (2.10)	258.43 (6.52)	854.25 (21.55)	1700.5 (42.91)	1066.77 (26.92)	3963.29 (100.00)
	ASLH	0.62	1.41	2.67	5.75	15.03	3.95
2010-11)#	No.	164.43 (15.62)	195.44 (18.57)	324.52 (30.83)	298.45 (28.35)	69.72 (6.62)	1052.55 (100.00)
	A	101 (3.00)	269 (7.00)	855 (22.00)	1713 (43.00)	1029 (26.00)	3967 (100.00)
	ASLH	0.61	1.38	2.63	5.74	14.76	3.77

Figures in parentheses indicate percentages of the total.

Note: ASLH: Average size of land holding. A: Area and No. : Number.

Source: \*www.indiastat.com, \*\*Agricultural Census of India, 2012; #Statistical Abstract of Punjab, 2012.



cent of small and marginal operated only on 10 per cent of the area while 25 per cent of the medium farmers operated on around 40 per cent of the total area and 7 per cent of the large farmers operated over 29 per cent of the area. In 1990-91, about 44 per cent of the operational holdings were of small and marginal farmers and the area operated by them was about 12 per cent. The proportion of semi-medium, medium and large operational holdings was 26 per cent, 23 per cent, 6 per cent, while the area operated by them was 21 per cent, 40 per cent and 27 per cent respectively. Similarly, during 1995-96, about 35 per cent of the small and marginal farmers operated on only 8.7 per cent of the area. The proportion of small and marginal farmers drastically reduced to 29.6 per cent during 2000-01 and the area cultivated by them was also reduced to nearly 8 per cent. Thus, it points to the fact that small and marginal farmers were pushed out of the agriculture during this period. However, the trend again reversed during 2005-06 when about proportion of small and marginal farmers again increased to 31.6 per cent and the area operated by them was 8.6 per cent. During 2010-11, percentage of small and marginal holdings in the state was 34 per cent which operated only on 10 per cent of the area. The average size of land holding which was 3.82 ha during 1980-81 marginally reduced to 3.77 ha during 2010-11.

#### **Agriculture Machinery and Implements**

The over capitalisation in farm mechanisation and it's under utilization leads to higher cost of production and lower net income to farmers, making it economically unviable. In the state with crop intensification,

**TABLE 7: FARM MACHINERY AND IMPLEMENTS IN PUNJAB**

Machines	(In thousand)			
	1980	1991	2001	2010-11
Tractors	110	265	405	434
Disc harrow	71	215	245	210
Seed-cum fertilizer drill	19	100	175	166.48
Tractor operated combine	-	-	5.2	6.05
Self propelled combine	-	-	3	8.13
Thresher	25	297	250	740
Tube wells	600	800	1073	1383
Spray pumps	-	-	565	600

*Source: Singh et. al., 2012 and Environment Statistics of Punjab, 2011.*

agriculture has become highly machinery dependent (Singh et al. 2012). Table 7 gives number of different type of farm machinery in Punjab. The table shows that the number of tractors in Punjab increased from 1.1 lakh in 1980 to 4.34 lakh in 2010-11. Like-wise number of disc harrows tripled from 71 thousand in 1980, to 210 thousand in 2010-11. The number of tube well increased from 6 lakh to 13.8 lakh from 1980 to 2010-11. Similarly, tractor operated and self propelled combines witnessed huge increase in number. Number of thresher increased from 25 thousand to 740 thousand in 2010-11. Thus, the table shows the huge mechanisation of Punjab agriculture which resulted in it's under utilization.

#### **CONCLUSION**

The study points that structure of Punjab economy has systematically changed from agrarian economy to more diversified industrial and service economy. The agriculture sector witnessed deceleration in terms of growth rate and its share in GSDP



also declined. It mainly happened due to monoculture of wheat and paddy along with stagnation in their productivities. Several other factors such as highly unequal ownership of land holdings, overuse of fertilizers and pesticides; and overcapitalization in farm machinery has also escalated crisis in state's economy. Thus, there is need to shift from traditional crop rotation of wheat and paddy to other demand driven crops such as fruits and vegetables, commercialization of enterprises such as dairying and poultry. It will also take care of industrialization particularly in rural areas which will help to integrate primary sector with secondary and tertiary sectors.

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