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Structural change and growth of agriculture in Haryana

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Abstract

Structural change 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 accelerate economic growth with improvements in productivity. Economic development has been regarded as the process of structural transformation where the relative share 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 Haryana. The objective of the study is to examine the structural change and performance of agriculture sector in Haryana. Haryana 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, consumption of fertilizers. The main findings: the pattern of structural change in Haryana 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.

Keywords: Structural Change, Agriculture, Haryana Economy.

1. Introduction

Structural change indicates qualitative transformation and evolution of the economic systems, usually marked by technological progress and organizational changes. Technological factors, knowledge and institutions are all elements that contribute to the process of structural change. The structural change is a process 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. (Clark 1940, Fisher 1940, Lewis 1955, Kuznets 1966, Rostow 1960) [3, 9, 16, 15, 24]. Every underdeveloped economy is characterized by larger share 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 sector increases. The structural shift and changing sectoral shares happen not only in domestic product but also in the shares of employment. With structural change and economic development, the relative importance of agriculture sector falls, along with rising share of secondary and tertiary sector. Such type of perceptions has led to the underestimation of the role of agriculture in the process of economic development. Haryana economy, predominantly 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 Haryana.

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. Structural change contributes to accelerate economic growth with improvements in productivity. (Papola 2006), (Justin 2011), (Cortuk, Singh 2013), (United Nations 2006) [19, 13, 6, 30]. According to Mc Millan, Rodrik (2011) [18],”

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The bulk of differences between Asia's growth, on the one hand and Latin America's and Africa's, on the other, can be explained by the variations in the contribution of structural change to overall labour productivity." There is disagreement among economists regarding the causes of structural change in the economies. The demand side and supply side arguments have been put forth. The neoclassical view that 'sectoral composition is a relatively unimportant by product of growth', has been convincingly questioned by structural economists like Kuznets, who have empirically demonstrated that growth is brought about by changes in sectoral composition. This is both for the reasons of demand and supply. Income elasticity of demand for agricultural products is low but high for, particularly manufacturing goods, and for services, it is still higher. As a result, with rising levels of income, the demand for agricultural products relatively declines and that for industrial goods increases and after reaching a reasonably high level of income, demand for services increase sharply. On the supply side, agriculture being mainly dependent on a fixed factor of production, namely land, faces a limit on its growth and is subject to early operation of the law of diminishing returns. In any case, structural changes in the national/state output inevitably accompany and bring about economic growth irrespective of the primary and secondary factors causing them (Chenery 1960)^[4]. Structural change in output are also expected to be accompanied by similar changes in employment. Thus in line with the decline in the share of agriculture in national/state product, a decline in the share of agriculture in employment can be expected, in the first instance, involving a transfer of labour from agriculture to industry. In fact, such a transfer is seen by economists like Arthur Lewis (Lewis, 1954)^[16] as a source of capital accumulation and a relatively costless process of economic growth. The various studies like Banga (2005), Rudardatt (2006), Bhowmik (2000), Eichengreen & Gupta (2010), Handsa (2005), Papola (2005)^[1, 25, 2, 8, 10, 19] confirm that Indian economy has undergone structural change and the share of agriculture output has fallen but this trend was not visible in the labour force. Economic development has been regarded as the process of structural transformation where the relative significance of agriculture output falls and also of labour force falls and industry was considered as an engine of growth. Different development economic theories led to the neglect of agriculture like Lewis (1954)^[16], Ranis, Fei (1961)^[20], Rostow (1960)^[24], Hirschman (1958)^[12], Raul Prebisch & Singer (1959)^[22] established case against agriculture by proving that secular terms of trade go against countries that export primary products & import manufactured goods. Therefore agriculture sector has been viewed as a passive sector while industrial and service sector as dynamic growing sectors.

Agriculture is a way of living, mode of life and occupation or business. It is the basic industry as it provides food for all & produces net surplus. Physiocrats viewed agriculture as an engine of growth as this sector only is capable of generating a surplus to stimulate growth in other sectors. Classical economists Adam Smith, Ricardo and Malthus recognized the importance of agriculture because food grains supply is a precondition to economic growth. Technological improvements in agriculture are essential. Western economists viewed that economic development is a process of structural transformation where the share of agriculture falls both in output and employment. Lewis's Theory of unlimited supplies of labour supported such views. Thus

large number of economists stressed on more investment in industries. Contrary to this, many models for agriculture growth have been developed by agriculture economists like Hayami and Ruttan's (1970)^[11] innovational model. Many empirical studies also highlighted the interdependence between agriculture & non agriculture growth. There are linkage between agriculture and industrial sectors as the former is supplier of wage goods & raw material to the latter. A one percent increase in agricultural output tends to raise industrial production by 0.5 percent & national income by 0.7 percent (Rangarajan 1982)^[21]. But the focus of development of economic theory & empirical studies remained on the development of industries & services sectors. Some empirical studies on agriculture confirms that sustainable development is possible when agriculture sector is developed equally along with secondary and services sector. Most of the studies (Dev 2003, Mathur, Das & Sircar 2007^[7, 17], Sen Mangal 1983^[26], Shiyani RL, Pandya 1998^[28], Singh, Indersain, Jain KK 1985)^[29] show that high level of investment, subsidies, irrigation facilities, human resource development, enhancement of farmers' earning capacities, credit facilities, diversification of agriculture and use of modern innovations at farm level are the major determinants of agriculture growth. The review of literature shows that the development process has led to fall in the share of agriculture in GDP. But the significance of agriculture sector in the process of sustainable development can never be underestimated.

The present study is divided into following sections: Section 2 discusses the objectives, data sources and methodology of research. Section 3 presents profile of Haryana. Section 4 presents results and discussions. Section 5 analyses the performance of agriculture in Haryana. Section 6 mentions the conclusions and suggestions and 7 area of further research.

2. Objectives of the study

- 1) To examine the structural change in the economy of Haryana.
- 2) To assess the performance of agriculture sector in Haryana.
- 3) To identify major factors responsible for the performance of agriculture sector in Haryana.

Research methodology: The stylized set of facts is that structural change is positively related to economic growth and with development, the share of agriculture falls, of industry and service sector rises. The study is carried out to find whether this pattern exist in the economy of Haryana. The selected indicators of structural change are sectoral composition of output, sectoral labour shares, 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, consumption of fertilizers etc. Secondary data from Economic Surveys and statistical abstracts of Haryana for various years have been used. Statistical averages, percentages, growth rates and compound annual growth rates have been calculated. Cropping intensity = Total cropped area/net sown area x 100; Irrigation intensity = Net area irrigated/net area sown x 100; Density of tractors = Number of tractors /total cropped area x 1000

3. Profile of Haryana State

Haryana is predominantly an agriculture state but it has accelerated the growth rates in all the three sectors,

especially industrial and service sector. The state is one of India's largest automobile hubs and accounts for two thirds of passenger cars, 50 percent of tractors and 60 percent of motorcycles manufactured in the country. The state has also emerged as a base for the knowledge industry, including IT and biotechnology. Haryana is the third- largest exporter of software and one of the preferred destinations for IT/ ITeS Facilities. Haryana has an area covering just 1.3 per cent of the country. Haryana contributes nearly 3.5 per cent to India's GSDP. During 2004-15, the GSDP grew at a compound annual growth rate (CAGR) of 12.93 per cent. Haryana have the third highest per capita income in the Country at constant prices Rs. 71493. Haryana is considered as the current growth engine of India. About 70% of residents are engaged in agriculture. Haryana is at second position in food grain production in the country. Wheat and rice are the major crops. Haryana is self-sufficient in food production and the second largest contributor to India's central pool of food grains. The main crops of Haryana are Wheat, Rice, Sugarcane, Cotton, Oilseeds, Gram Barley, Corn Millet etc. The major Kharif crops of Haryana are rice, Jowar, bajra, maize, cotton, jute, sugarcane, sesame and groundnut. The major Rabi crops are Wheat, tobacco, gram, linseed, rapeseed and mustard. About 86% of the area is arable, and of that 96% is cultivated. About 94.4% of the area is irrigated through tube-wells and an extensive system of canals. Haryana contributed significantly to the Green Revolution that made the country self-sufficient in food production. Haryana has a tremendous irrigation infrastructure. Irrigation in Haryana uses water either from underground or from surface through canals. Currently in Haryana, the most important technology for groundwater irrigation is the use of tube-wells with pump. Besides farming, dairy farming is also essential part of the rural economy. Haryana has a livestock population of 98.97 lakh. Haryana, with 660 grams of availability of milk per capita per day, ranks at number two in the country as against the national average of 232 grams. There is a vast network of milk societies that support the dairy industry. The National Dairy Research Institute at Karnal, and the Central Institute for Research on Buffaloes at Hisar are instrumental in development of new breeds of cattle and propagation of these breeds through embryo transfer technology. The Murrah breed of buffalo from Haryana is world-famous for its milk production. There has been diversification of agriculture activities in the form of horticulture, fisheries etc. As a consequence of rapid structural transition of the State economy over the years, the contribution of the Agriculture & Allied Sector at constant (2004-05) prices went down to only 15.6 percent in the SGDP during 2012-13. Agriculture and Allied Sector is composed of Agriculture, Forestry & Logging and Fishing Sub-Sectors. Agriculture including crop and dairy farming is the main component contributing about 95 percent in GDP of Agriculture and Allied Sector. The contribution of Forestry and Fishing Sub-Sectors in GDP of Agriculture and Allied activities is merely around 4 and 1 percent respectively resulting in very low impact of these two Sub-Sectors on the overall growth of Agriculture and Allied Sectors.

4. Results and Discussions

Haryana economy has moved on the path of progress, expressed in the form of SGDP and PCY. The State per capita income has risen from Rs. 608 in 1966-67 to Rs. 47046 in 2007-08 and to Rs. 71493 in the year 2014-

15(Table 1). The SGDP rose from 126170.76 crore rupees in 2007-08 to 215145.73 crore rupees in the year 2014-15. It shows an increase of 36 percent in PCY and 70 percent in SGDP in a time period of 8 years. (Table1.1). During 11th plan, the SGDP grew at an average rate of 8.7 percent p.a. and 6.5 percent and 6.9 percent in 2012-13 and 2013-14. (Table1.2). The major indicators of structural change include Sectoral composition of SGDP, SPCY, share of the sub-sectors, growth rates of sectors and sub-sectors. (Table 1 to Table1.6). The analysis of these indicators in the state of Haryana points to the faster economic growth along with structural change. The growth rates of agriculture and allied sectors was lowest i.e. 3.7 percent. Transport, Trade, communication experienced the highest growth rate (12.8 percent) during the 11th plan, followed by finance, real estate. Community & personal services (11.7%), electricity, gas & water supply (1.4%). The yearly growth for the agriculture sector kept fluctuating between -1.7 percent to 7.4 percent (Table2). The changing sectoral composition of the three main sectors confirm the structural change. The share of Agriculture fell from 60.7 percent in 1969-70 to 42.5 percent in 1993-94 in a span of 24 years while that of secondary rose from 17.6 percent to 26.2 percent and the share of services sector rose from 21.7 percent to 31.3 percent during the same period. It means a fall of 18 percent in 24-25 years during the pre-reforms period. But the pace of structural change accelerated after the introduction of economic reforms and the share of agriculture fell by 13 percent (from 42.5 to 29.5) during 1993-94 to 2003-04 in a span of just 10 years. In the next 10 years, it fell by 9 percent from 29.5 to 20.6 in 2014-15. In the post-reform period, the sectoral composition changed at a faster rate, the share of agriculture fell by 28.4 percent, that of services sector by 27.6 percent in a span of 20 years. (Table 1.3). This is the period of high growth in the state of Haryana. The secondary sector depicts somewhat different picture. Its share rose from 17.6 percent in 1969-70 to 32.9 in year 2004-05 but after that its share fell to 27 percent in 2014-15. In tune with the Indian economy, Haryana economy experienced structural change bypassing the required and expected high growth of secondary sector. The sectoral distribution of gross fixed capital formation (GFCF) in Haryana indicates that agriculture has got lowest share in the GFCF. It was 9.3 percent in 2004-05 and rose to 12.2 percent only in the year 2011-12 (Table 1.5). The occupational distribution of workforce (Table 1.6) in Haryana depicts a negative CAGR (-1.29) for workforce in primary sector in a span of 30 years, Indicating that structural change in the labour share has occurred at a slow rate. All the indicators of structural change in Haryana prove that the state economy has undergone structural change, accelerating the economic growth rate, but reducing the significance of agriculture in the development process.

5. Performance of agriculture in Haryana

Table 2 indicates unstable growth pattern of agriculture and allied sectors. Agriculture experienced negative growth rate for three years in a span of 9 years while forestry, fishing has positive growth rates in general. Area under principal crops like wheat, paddy, sugarcane, cotton and oilseeds has increased manifold. The area under wheat rose by 233.3 percent, 516.14 percent for paddy, 248.63 percent for cotton, 159.4 percent for oilseeds while area reduced by 24.71 percent for sugarcane, (reasons can be price support policies etc.) and rose by 24.71 percent only for all food grains in a span of 50 years. The gross area sown rose only by 35.74

percent for the same period (Table 1.2). The production of major crops has been on the rise since 1966-67 (the inception year of Haryana and green revolution period). The production of wheat rose by 976 percent, rice by 1582 percent, total food grains by 526 percent, oilseeds by 989 percent, cotton by 551 percent, sugarcane by 65 percent only in a span of 50 years. (Table 2.2). In the pre-reforms decade, the CAGR of wheat (6.31%) and of total food grains (4.70%) was highest. After reforms, the CAGR of wheat and all food grains reduced to 4.51% and 3.35% respectively in the decade 1990-2000 and it fell further to 0.82% (wheat) and 1.45% (total food grains) during the decade 2000-2010. However, during 11th plan the CAGR of wheat was 5.10 % and of all food grains was 3.73%. The average yield of wheat rose by 227 percent and of rice by 173 percent during 50 years. It has remained much higher than the national average yield. (Table 2.3). Examining the process of technological development in agriculture in Haryana, it is observed that the parameters like density of tractors, intensity of cropping, intensity of irrigation and use of fertilizers show a positive sign of development. These are the determinants of possible diversification of crops and allied activities in Haryana agriculture. The density of tractors rose from 1.04 in 1966-67 to 43.40 in the year 2013-14. (Table 3). The cropping intensity rose from 123.9 percent to 184.20 percent during 1966-67 to 2013-14 (Table 3.1). While the net irrigated area rose from 1293 thousand hectares in 1966-67 to 3102 thousands hectares and intensity of irrigation rose from 37.08 percent in 1966-67 to 88.43 percent in the year 2013-14 (Table 3.2). The consumption of fertilizers rose from 42 kg per hectares in 1966-67 to 225 kg per hectares in 2013-14, an increase of 435 percent in 50 years (Table 3.3).

6. Conclusions

Haryana economy has undergone the process of structural transformation 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 for innovations in agriculture in Haryana. The author fully agrees with Hayami and Ruttan (1971) ^[11] who stressed on the role of public sector in agricultural innovations. Such innovations will induce the farmers and institutions to raise production and further innovations. The study suggests strongly the increased role of government. There is urgent need for farm innovations and diversification of crops and allied activities.

7. Areas of further research

The performance of agriculture in Haryana can be assessed on the basis of new crops, employment shares, marginal farmers, contract farming, agricultural prices policies, procurement policy, adoption of modern techniques, best farm practices and innovations by farmers and performance at district level. Haryana agriculture is facing many serious challenges like diversification of crops, depletion of ground water, problem of alkalinity, sustainability of soil, deficiency of micro nutrients, financial literacy, warehousing etc.

Table 1: State Per Capita Income (constant prices) (2004-05)

year	rupees
1966-67	608
2007-08	47046
2008-09	49780
2009-10	55044
2010-11	57797
2011-12	61716
2012-13 (P)	64052
2013-14 (Q)	67260
2014-15 (A)	71493

Source: Economic Survey, Haryana 2014-15

P: Provisional Estimates, Q: Quick Estimates, A: Advance Estimates

Table 1.1: Gross State Domestic Product, Haryana

Plan Period /year	Gross state Domestic Product at current Prices (Crore Rupees)	Gross State Domestic Product At Constant Prices 2004-05 (Crore Rupees)
2007-08	151595.90	126170.76
2008-09	182522.15	136477.94
2009-10	223600.25	152474.47
2010-11	260621.28	163770.20
2011-12	298688.33	176916.97
2012-13(P)	341351.16	186642.83
2013-14(Q)	388916.63	199656.83
2014-15(A)	435310.05	215145.73

Source: Economic Survey, Haryana 2014-15

Table 1.2: Growth in SGDP (11th & 12th Five Year Plans) (Percent)

Industry	11 th Plan (2007-12)	2012-13 (Q)	2013-14
Agriculture & Allied Activities	3.7	-0.7	3.2
Mining & Quarrying	-20.3	-13.7	-1.2
Manufacturing	6.6	4.9	3.8
Electricity, Gas & Water Supply	10.4	0.5	5.1
Construction	4.4	4.7	4.6
Transport, Communication & Trade	12.8	6.7	5.6
Finance & Real Estate	12.2	15.3	15.6
Public Administration	9.8	5.5	3.5
Other Services	12.6	13.0	13.0
Community & Personal Services	11.7	10.9	10.5
Gross State Domestic Product	8.7	6.5	6.9

Source: Department of Economic & Statistical Analysis, Haryana

Table 1.3: Changing Sectoral Composition, Haryana (percent)

year	Agriculture	Industry	Services
1969-70	60.7	17.6	21.7
Base year 1993-94			
1993-94	42.5	26.2	31.3
1994-95	42.4	26.7	30.9
1995-96	39.4	28.3	32.3
1996-97	39.2	27.1	33.7
1997-98	35.6	28.4	36.0
1998-99	34.9	28.8	36.3
1999-2000	33.9	28.2	37.9
2000-01	32.6	27.9	39.5
2001-02	31.1	28.0	40.9
2002-03	29.3	27.8	42.9
2003-04	29.5	27.5	43.0
Base year 2004-05			
2004-05	23.1	32.9	44.0
2006-07	21.3	32.1	46.6
2009-10	17.44	29.92	52.64
2011-12	16.8	28.7	54.5
2012-13	15.6	27.7	56.7
2013-14	15.0	27.0	58.0
2014-15(AE)	14.1	27.0	58.9

Source: Economic surveys, Haryana, various years

Table 1.4: Structural change -Composition of SGDP, Haryana

Year	Primary sector	Secondary sector	Tertiary Sector
1990-91	37.31	29.65	33.04
2000-01	29.25	29.79	40.96
2009-10	17.44	29.92	52.64
CAGR(1990-2010)	-3.73	0.04	2.35

Source: Economic surveys, Haryana, various years

Table 1.5: Gross Fixed Capital Formation, Haryana (percent)

Year/Sector	Primary	Secondary	Tertiary
2004-05	9.3	55.5	35.2
2005-06	8.6	56.5	34.9
2006-07	8.9	58.0	33.1
2007-08	9.8	57.2	33.0
2008-09	9.7	57.7	32.8
2009-10	10.4	5.51	38.1
2010-11	10.6	55.2	34.2
2011-12	12.2	54.1	33.7

Source: calculated on the basis of data from Economic surveys, Haryana, various years

Table 1.6: Occupational Distribution of Workforce, Haryana

Year	Primary sector	Secondary sector	Tertiary Sector
1980-81	65.13	14.25	20.62
1990-91	61.44	12.55	26.02
2000-01	52.40	15.97	31.63
2009-10	44.11	19.43	36.46
CAGR(1980-2010)	-1.29	1.04	1.92

Table 2: Growth of Agriculture and Allied Sectors (percent)

Sectors	2007-08	2008-09	2009-10	2010-11	2011-12	2007-12	2012-13	2013-14	2014-15(A)
Agriculture	-0.3	7.4	-1.7	5.3	7.6	3.8	-0.8	3.1	-0.5
Forestry	3.0	2.4	2.1	2.5	2.2	2.4	3.0	3.5	3.5
Fishing	11.9	13.3	15.5	6.6	12.8	12.0	5.2	-5.3	26.6
Agriculture and Allied Sector	-0.1	7.2	1.4	5.2	7.4	3.8	-0.6	3.1	-0.1

Source: Department of Economics & Statistical Analysis, Haryana

Table 2.1: Area under Principal Crops in Haryana (000 Hectares)

Year	Wheat	Paddy	Total F/Grain	Sugarcane	Cotton	Oilseeds	Gross Area Sown
1966-67	743	192	3520	150	183	212	4599
1970-71	1129	269	3868	156	193	143	4957
1980-81	1479	484	3963	113	316	311	5462
1990-91	1850	661	4079	148	491	489	5919
2000-01	2355	1054	4340	143	555	414	6115
2005-06	2303	1047	4311	129	584	736	659
2006-07	2376	1042	4348	141	527	622	6407
2007-08	2461	1073	4477	140	482	511	6458
2008-09	2462	1211	4621	91	456	528	6484
2009-10	2488	1206	4541	79	505	523	6351
2010-11	2504	1243	4702	85	493	521	6357
2011-12	2531	1234	4581	95	602	546	6505
2012-13	2497	1215	4397	101	595	571	6052
2013-14	2499	1228	4357	102	564	549	6243
2014-15provisional	2478	1183	4390	113	638	550	6243

Source: Deptt. of Land Records, Haryana & Agriculture Deptt., Haryana

Table 2.2: Agricultural Production of Major Crops (000 Tonnes)

Year	Wheat	Rice	Total F/Grain	Oilseeds	Cotton (000 bales)	Sugarcane
1966-67	1059	223	2592	92	288	5100
1970-71	2342	460	4771	99	373	7070
1980-81	3490	1359	6036	188	643	4600
1990-91	6436	1834	9559	638	1155	7800
2000-01	9669	2695	13295	563	1383	8170
2005-06	8853	3194	13006	830	1502	8310
2006-07	10059	3371	14759	837	1805	9651
2007-08	10232	3606	15294	617	1882	8850
2008-09	11360	3299	16178	911	1862	5206
2009-10	10488	3628	15346	862	1919	5707
2010-11	11578	3465	16568	965	1747	6042
2011-12	13119	3757	18370	758	2616	6953
2012-13	11117	3976	16226	980	2384	7437
2013-14	11800	3998	16944	899	2017	7500
2014-15(Provisional)	11399	3753	16241	1002	1876	8418

Source: Deptt. of Land Records, Haryana & Agriculture Deptt. Haryana

Table 2.3: Average Yield of Wheat and Rice, Haryana and all India Level (Kg. per Hect.)

Year	Wheat (Haryana)	Rice (Haryana)	Wheat (India)	Rice (India)
1966-67	1425	11611	-----	-----
1970-71	2074	1697	-----	-----
1980-81	2360	2606	-----	-----
1990-91	3479	2775	2280	1740
1995-96	3697	2225	2483	1797
1996-97	3880	2967	2679	1882
1997-98	3660	2800	2485	1900
1998-99	3916	2239	2583	1928
1999-2000	4165	2385	2621	1985
2000-01	4106	2557	2708	1901
2005-06	3844	3051	2619	2102
2006-07	4232	3238	2708	2131
2007-08	4158	3361	2785	2203
2008-09	4614	2724	2907	2178
2009-10	4215	3008	2907	2125
2010-11	4624	2788	2938	2240
2011-12	5183	3044	3140	2207
2012-13	4452	3272	NA	2372
2013-14	4952	3256	NA	NA
2014-15 (Provisional)	4600	3172	----	----

Source: Deptt. of Land Records, Haryana & Agriculture Deptt. Haryana

Table 3: Tractorisation and density of Tractors in Haryana

Year	No. of Tractor (S000's)	Density of Tractors
1966-67	5	1.04
1970-71	12	2.48
1980-81	53	9.65
1990-91	130	22
2000-01	210	33.52
2003-04	232	36.23
2004-05	240	37.27
2005-06	247	38.83
2006-07	254	39.64
2007-08	261	40.42
2008-09	265	40.89
2009-10	259	40.78
2010-11	262	41.21
2011-12	267	41.04
2012-13	270	44.61
2013-14	271	43.40

Calculated, (Data, Dept. of Agriculture)

Table 3.1: Cropping Intensity, Haryana (percent)

Year	Intensity of Cropping
1966-67	123.9
1970-71	139.54
1980-81	151.34
1990-91	165.62
2000-01	170.57
2003-04	180.35
2004-05	183.67
2005-06	181.71
2006-07	182.21
2007-08	182.74
2008-09	183.43
2009-10	183.96
2010-11	184.90
2011-12	184.71
2012-13	181.49
2013-14	184.20

Calculated, (Data, Dept. of Agriculture).

Table 3.2: Status of Irrigation, Haryana

Year	Net Irrigated Area (Ooo's) Hect.	Intensity of Irrigation (%)
1966-67	1293	37.08
1970-71	1532	43
1980-81	2134	59.21
1990-91	2600	72.91
2000-01	2958	79.91
2003-04	2969	84.00
2004-05	2958	83.73
2005-06	2936	82.33
2006-07	2913	81.4
2007-08	3025	84.21
2008-09	2976	85.51
2009-10	3069	86.43
2010-11	2887	82.11
2011-12	3072	87.40
2012-13	3102	88.43
2013-14	3102	88.43

Calculated, (Data, Dept. of Agriculture). Economic Surveys. Haryana

Table 3.3: Consumption of Fertilisers, Haryana (kg per hectare)

Year	Fertilizer Use
1980-81	42
1990-91	99
2000-01	152
2003-04	165
2004-05	168
2005-06	173
2006-07	173
2007-08	187
2008-09	199
2009-10	209
2010-11	209
2011-12	224
2012-13	224
2013-14	225

Source: Dept. of Agriculture, Haryana

Annexure I

Agricultural Profile of Haryana

Geographical Area	44,212 Sq Km
Density of Population	573
Cultivated Area	38.09 Lakh Hectares
Net Sown Area	35.56 Lakh Hectares
Gross Cropped Area	63.76 Lakh Hectares
Cropping Intensity	182 Percent
Irrigated Area	84 Percent
No. of operational Farm Holdings	16.17 Lakhs
Average Size of Holdings	2.25 hectares
Area Under Forests	4.0 Percent
Marginal Farmers	7.04 Lakhs (46.1 Percent)
Small Farmers	2.94 Lakhs (19.3 Percent)
Others	5.30 Lakhs (34.7 Percent)
Contribution To National Wheat Production	13.3 Percent
Average Productivity of Wheat	4 Tonnes /Ha

Source: Economic Survey 2014-15

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