

Study No. 113

STATE OF AGRICULTURE IN CHHATTISGARH



AGRO- ECONOMIC RESEARCH CENTRE FOR MADHYA PRADESH AND CHHATTISGARH
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.)

2014

STATES OF AGRICULTURE IN CHHATTISGARH

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New Delhi**



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Preface

Chhattisgarh is the 10th largest and 16th most-populated state of India and known to a source of electricity, steel for the country it accounts for 15% of the total steel produced in the country. Favorable soil and climatic conditions helped the state to be a leading producer of paddy, jwar, groundnut, gram, oilseeds and wheat in the country. Chhattisgarh agriculture, with each passing day is gaining a new momentum, which will help it to forward its steps towards an economically viable phase. The state has received a national award- 'Krishi Karman Award' for highest productivity of rice in the year 2010-11. Around 45.95 per cent land of the state is under forest cover with abundant natural resources. Huge quality of minerals and mineral reserves found in Chhattisgarh attract entrepreneurs to establish industries in the State. The strategic location, abundant power supply and rich storehouse of minerals augment the state's industrial and economic potential. In spite of the above there are so many challenges are exist which needs to be addressed for prolong growth. In order to understand the prevailing pitfall and challenges to agricultural growth in various states the Ministry of Agriculture Government of India propose to carry out state specific report focusing on agricultural scenario which were assign to various AERCs / Unit located at different states in India. The Agro-Economic Research Centre was entrusted to prepare report on agricultural scenario in the state of Chhattisgarh. "State of Agriculture in Chhattisgarh" was prepared by using secondary data collected from various sources. This study enlightens the performance of agriculture in Chhattisgarh along with future option available for accelerated growth with inclusiveness of all the stake holders for the benefit of the farming community.

I am thankful to Dr. Deepak Rathi, Mr. Hemant Kumar Niranjana and Mr. Ravi Singh Chouhan for putting their untiring efforts to complete this profile.

I also thank the Ministry of Agriculture, Government of India for their cooperation and support. It is hope that this profile will be useful to agriculture scientist, economists, non-governmental organization, policy makers and planners for understanding the present condition of agriculture in Chhattisgarh.

Date :

(Hari Om Sharma)

Director

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STATES OF CHHATTISGARH IN AGRICULTURE

Introduction

Chhattisgarh is a state in Central India. It is the 10th largest state in India with an geographical area of 137, 90 thousand ha. Chhattisgarh stretches across the latitudinal expanse of 17°46' to 23°15' North on one hand to the longitudinal meridian of 80°30' to 84°23' East on the other. Chhattisgarh is the 16th most-populated state of the nation. It is a source of electricity and steel for India. Chhattisgarh accounts for 15% of the total steel produced in the country. The state was formed on 1st November 2000 by partitioning 16 Chhattisgarhi-speaking south-eastern districts of Madhya Pradesh. Raipur was made its capital. Chhattisgarh borders the states of Madhya Pradesh in the north-west, Maharastra in the south-west, Andhra Pradesh in the south, Odisha in the east, Jharkhand in the north-east and Uttar Pradesh in the north. The state is divided into 27 districts. Raipur, Bhilai, Durg, Bilaspur, Korba and Rajnandgaon are the major of Chhattisgarh cities (Fig. 1). Bastar plateau, Chhattisgarh plains and Northern hills are the prime geographical landmarks that have been marked as the productive areas of Chhattisgarh agriculture. Paddy, maize, jowar, groundnut, gram, and wheat are major crops grown in Chhattisgarh. Chhattisgarh known for rice cultivation and called “rice bowl” of India. Horticulture is a significant extension of agriculture industry in the state of Chhattisgarh. Medicinal herbs, flowers and aromatic plants form the key component of horticulture in the state. The government of Chhattisgarh offers co-operatives to the farmers of the state to enable them to buy best quality seeds and agricultural tools. Also, from time to time, the state and district level co-operatives provide loan facilities to the under-privileged peasants. Chhattisgarh agriculture, with each passing day is gaining a new momentum, which will help it to forward its steps towards a economically viable phase. In the year 2004 Chhattisgarh reached a remarkable Gross State Domestic Product of over 12 billion US Dollars. The strategic location, abundant power supply and rich storehouse of minerals augment the state's industrial and economic potential.

Around 45.95 per cent land of the state is under forest cover with abundant natural resources. Favorable soil and climatic conditions helped the state to be a leading producer of rice, paddy, jwar, groundnut, gram, oilseeds and wheat in the country. Land of Chhattisgarh is replete with minerals. Huge quality of minerals and mineral reserves found in Chhattisgarh attract entrepreneurs to establish industries in the State. Approximately 27 per cent revenue of Chhattisgarh is received in form of mineral revenue from exploitation of minerals. (Source: Directorate of Economics and Statistics Chhattisgarh, Raipur-Economic Survey 2012-13).

There is abundance of coal, bauxite, lime stone and dolomite in the State. The Chhattisgarh is the sole producer of tin ore of strategic importance in the country. Chhattisgarh State Industrial

Development Corporation Ltd. (CSIDC) has been established



Fig. 1: Districts of Chhattisgarh

in Raipur after formation of the State (2001). The state is a manufacturing base for a number of large and medium scale industries from diverse sectors such as publicity, development of infrastructure facilities, setting up of industrial areas, role of being instrumental in marketing of small industries, supply of raw material, operation of Govt. industries, water supply, value addition of minor forest product, herbal/medicinal. Chhattisgarh State has the distinction of producing three types of silk variety viz., tasar, mulberry and eri.

Table 1.1: Demographic Features of Chhattisgarh State.

Date of Established	01 November 2000
Capital	Raipur
Latitude	17 ° 46' and 23 ° 15' N
Longitude	80°30' and 84 ° 23' E
Area in sq km	135192
Total Population	25545198
Male	12832895 (50.24)
Female	12712303 (49.76)
Population (0-6 Age)	3661689
Population Growth (%)	22.61
Number of districts	27
Number of Tehsils	149
Number of Development Blocks	146
Number of Villages	20308
Number of Gram Panchayats	9734
Sex Ratio (over 1000)	991
Child Sex Ratio	969
Density of population (person/sq km)	189
Literacy (%)	70.28
Male Literacy	80.27
Female Literacy	59.58

Source : <http://www.census2011.co.in/census/state/chhattisgarh.html>, Figures in parenthesis show percentage to total population.

1.2 Population

The total population of Chhattisgarh state as per 2011 census is 2,55,45,198 of which male and female are 50.24% and 49.76% respectively. In Chhattisgarh state sex ratio per 991 over 1000 males and density of population 189 Per Sq.Km. Literacy rate has seen 70.28 per cent with male literacy of 80.27 per cent and female literacy of 59.58 per cent (Table 1.1).

Table 1.2: Population Structure in Chhattisgarh State.

(Numbers)

Description	Rural	Urban	Total
Population (%)	76.76	23.24	100.00
Total Population	19607961	5937237	25545198
Male Population	9797426 (49.97%)	3035469 (51.12%)	12832895
Female Population	9810535 (50.03%)	2901768 (48.87%)	12712303
Population Growth (%)	17.78	41.84	22.61
Sex Ratio (over 1000)	1001	956	991
Child Sex Ratio (0-6)	977	937	
Child Population (0-6)	2924941	736748	
Child Percentage (0-6) (%)	14.92	12.41	
Literates	11008956	4370966	
Average Literacy (%)	65.99	84.05	
Male Literacy	76.98	90.58	
Female Literacy	55.15	73.39	

Source : <http://www.census2011.co.in/census/state/chhattisgarh.html>.

The majority of the population of Chhattisgarh lives in rural areas (76.76%) as compared to urban population (23.24%). In actual numbers of males and females were 12832895 and 12712303 respectively. In rural area female sex ratio per 1000 males was 1001 while for the child (0-6 age) it was only 977 girls per 1000 boys. Child population forms 14.92 per cent of total rural population. Literacy rate in rural areas was 65.99 per cent in which 76.98% males were literate while female literacy rate of 55.15%. The population of urban male and female were 51.12, 48.87 per cent to total population. Sex ratio in urban area was 956 females per 1000 males, while for child (0-6) sex ratio for urban area stood at 937 girls per 1000 boys. There were 12.41 % of children (0-6) in total population of urban areas average literacy rate in urban area was 84.05 per cent in which, males 90.58% literate, while female literacy stood at 73.39 per cent (Table 1.2).

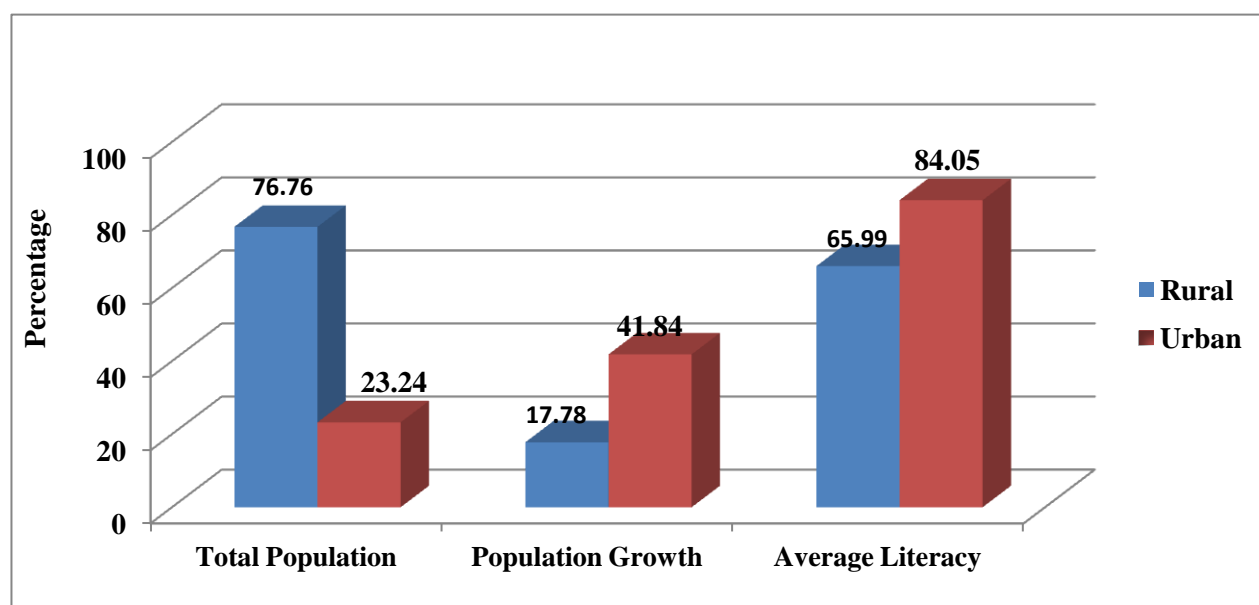


Fig 2: Percentage of Population Structure in Chhattisgarh.

The total working population belongs to cultivators (49.45%) followed by others (26.30%), agriculture labour (22.00%) and household industry workers (2.25%) (Table 1.3). The total rural working population was found to be maximum in the rural areas (83.40%) as compared to the urban areas (16.60%). In rural areas the maximum working population related of cultivators (58.54%) followed by agriculture labour (25.74%), other (13.73%) and household industry workers (1.99%), while in urban areas contributed of other workers (89.50%) was found to be maximum followed by cultivators (3.76%), household industry workers (3.59%) and agriculture labour (3.16%). (Table 1.3)

Table 1.3: Composition of Population in Chhattisgarh State (2011).

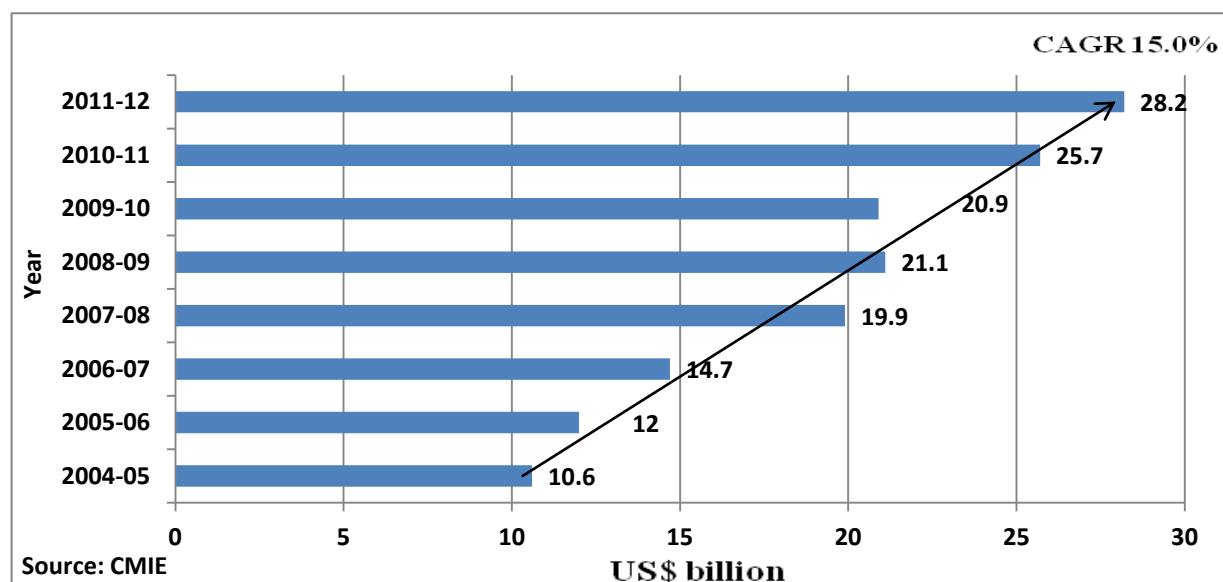
(000' Numbers.)

Working population	Rural	Urban	Total
Total Main Workers	5885 (83.40)	1171 (16.60)	7056 (100)
Agriculture Labour	1515 (25.74)	37 (3.16)	1552 (22.00)
Cultivators	3445 (58.54)	44 (3.76)	3489 (49.45)
Household industry workers	117 (1.99)	42 (3.59)	159 (2.25)
Others	808 (13.73)	1048 (89.50)	1856 (26.30)

Source: Chhattisgarh at a Glance 2011. Figures in parenthesis show percentage to total.

1.3 State Domestic Product

The Gross State Domestic Product (GSDP) of Chhattisgarh was found to be increased from 10.6 US\$ billion (2004-05) to 28.2 US\$ billion (2011-12), with an average growth rate of 15.0 per cent per annum (Fig. 3).

**Fig. 3: Gross State Domestic Products of Chhattisgarh.**

The Net State Domestic Product (NSDP) of Chhattisgarh was about 24.7 US\$ billion (2011-12) which was found to be increased from 9.2 US\$ billion (2004-05), with an average growth of 15.1 per cent per annum (Fig. 4).

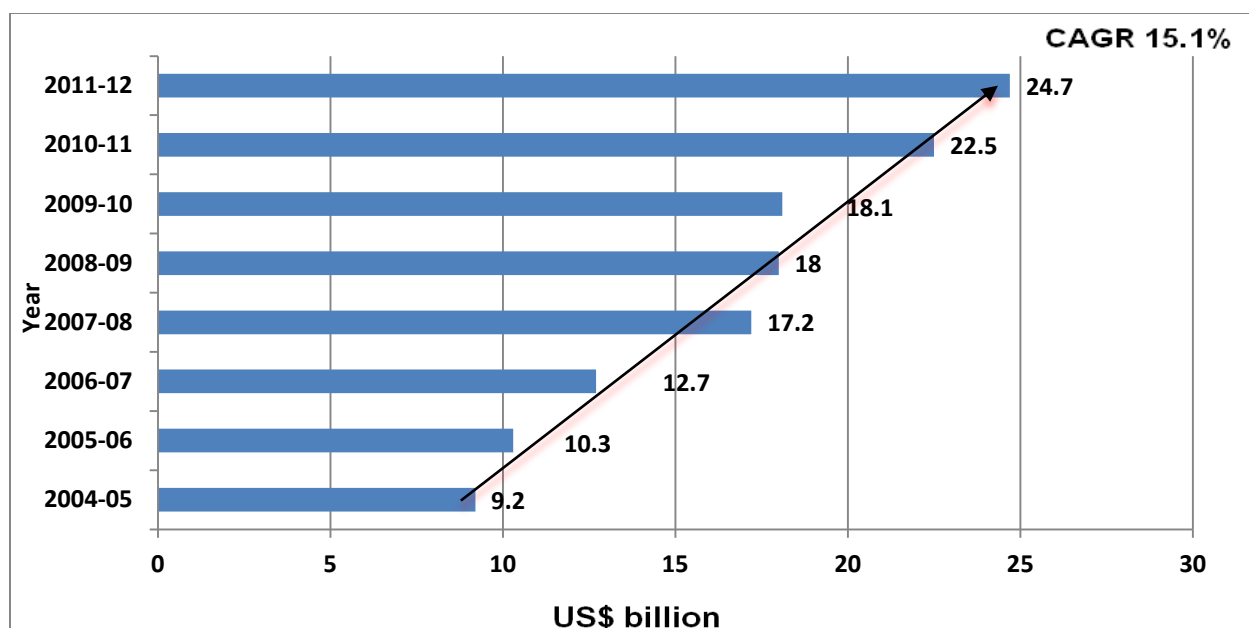


Fig. 4: Net State Domestic Products of Chhattisgarh.

As regard to the state's per capita GSDP was concern it was found to be US\$ 1,108.7 (2011-12) and increased with per capita with Compound Annual Growth Rate (CAGR) of 12.7 per cent per annum (Fig. 5) over US\$ 477.4 (2004-05).

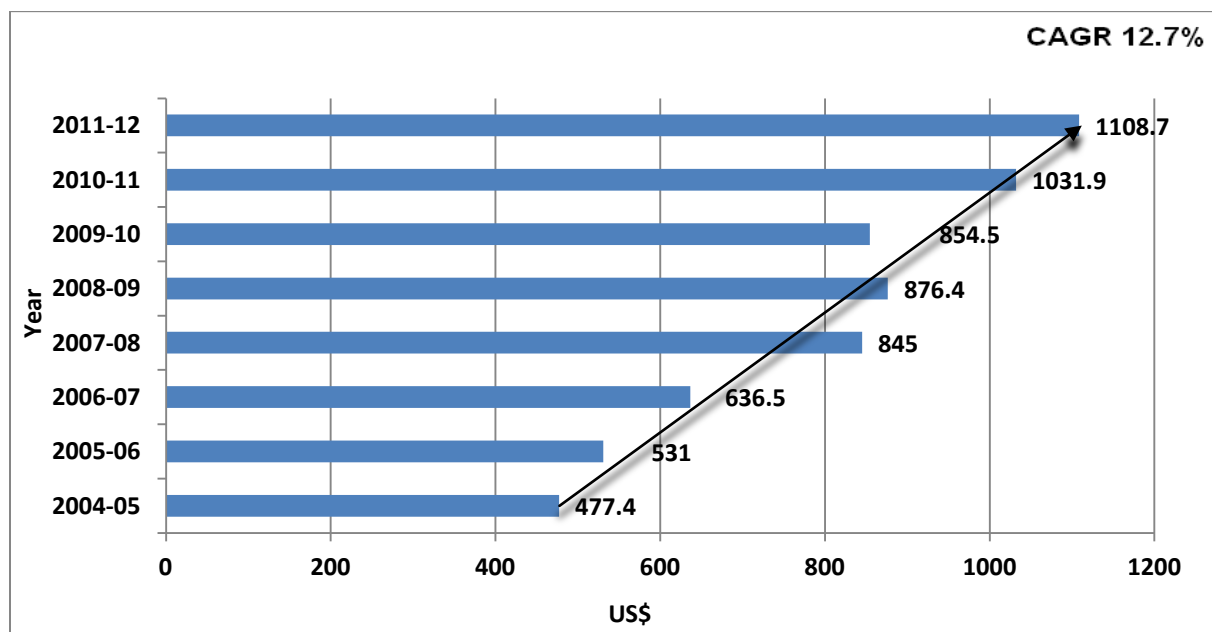


Fig. 5: Per Capita Gross State Domestic Products of Chhattisgarh.

while the state per capita NSDP increased with a compound growth of 13% per annum (Fig. 6), increased from US \$ 412.8 (2004-05) to US\$ 971.4 (2011-12)

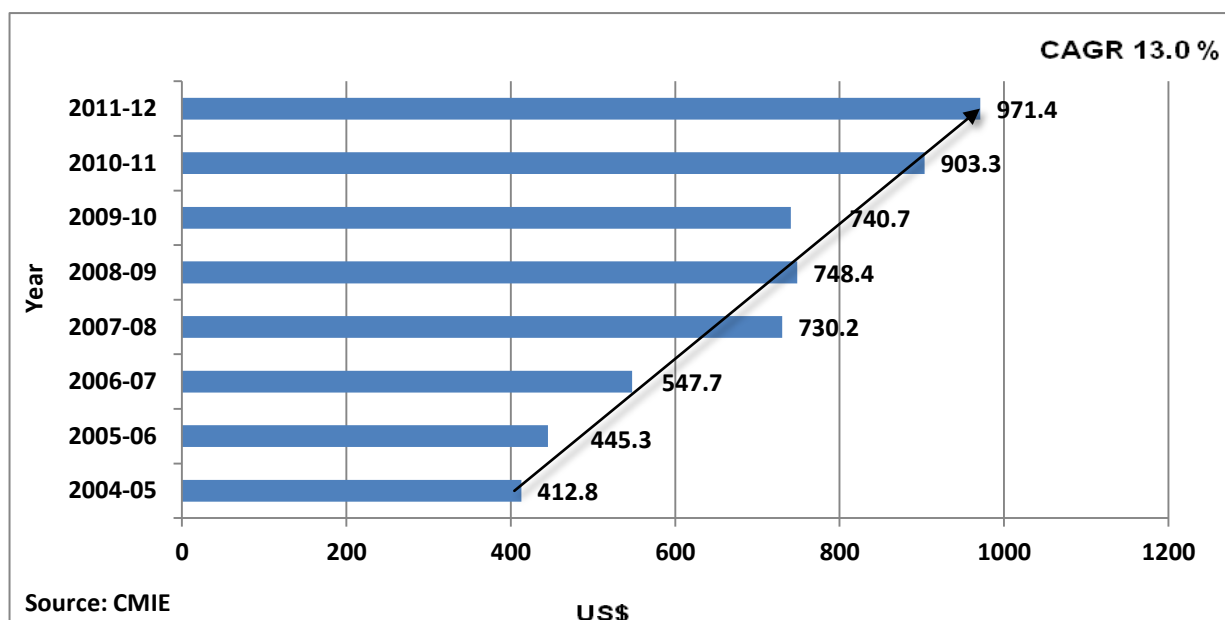


Fig. 6: Per Capita Net State Domestic Products of Chhattisgarh.

The tertiary sector (36.7%) contributed the highest i.e. US\$10.3 billion (2011-12) GSDP of Chhattisgarh followed by the secondary sector (32.8%) and primary sector (30.5%). The growth of tertiary sector driven by trade, hotel, real estate, banking, insurance, transport, communications and other services. The tertiary sector (17%) of the state grew with a faster rate as compared to secondary (15.8%) and primary (15%) sectors (Fig. 7) during the period of 2004-05 to 2011-12.

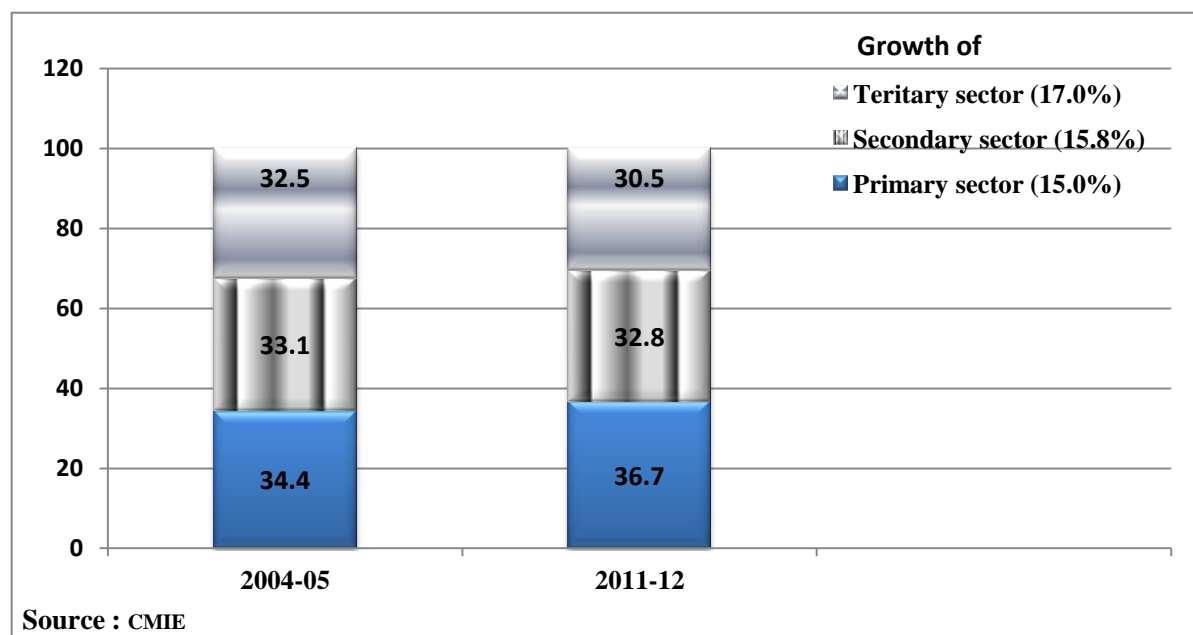


Fig. 7: Contribution of Different Sector in GSDP at Current Prices.

Table 1.4: General Information of Chhattisgarh State.

Parameter	Chhattisgarh	All-States	Source
Economy			
GSDP as a percentage of all states' GSDP	1.7	100	CMIE, 2010-11, current prices
Average GSDP growth rate (%)*	16.1	15.9	CMIE, 2004-05 to 2010-11, current prices
Per capita GSDP (US\$)	1,031.9	1,324.3	CMIE, 2010-11, current prices
Physical Infrastructure			
Installed power capacity (MW)	5,624.6	211,766.2	Central Electricity Authority, as of January 2013
Wireless subscribers (No)	50,668,593^	864,720,186	Telecom Regulatory Authority of India, as of December 2012
Broadband subscribers (No)	95,499	13,350,938	Ministry of Communications & Information Technology, as of December 2011
National Highway length (km)	2,289	76,818	Ministry of Road Transport & Highways, as of June 2012
Airports (No)	2	133	Airport Authority of India
Social Indicators			
Literacy rate (%)	71.0	74.0	Provisional Data – Census 2011
Birth rate (per 1,000 population)	24.9	21.8	SRS Bulletin (www.censusindia.gov.in), 2012
Investments			
FDI equity inflows (US\$ billion)	0.9*	187.9	Department of Industrial Policy & Promotion, April 2000 to December 2012
Outstanding Investments (US\$ billion)	377.0	11,318.3	CMIE (2011-12)
Industrial Infrastructure			
PPP projects (No)	4	881	www.pppindiadatabase.com
SEZ (No)	1	386	Notified as of January 2013, www.sezindia.nic.in

*Chhattisgarh PPP: Public Private Partnership, SEZ: Special Economic Zone, SRS: Sample Registration System , *In Indian Rupee Terms ^Including Chhattisgarh.

Chhattisgarh contributed 1.7 per cent GSDP of all the states. The average GSDP growth was found to be 16.1 against 15.9 per cent per annum of all the states of India (Table 1.4). The per capita GSDP (\$) was found to be low (1031.9) compared to all states of India (1324.3). The FDI equity flow was found to be only 0.9 US\$ billion as against 187.9 US\$ billion of all the states of India. There were only 4 Public Privet Partnership (PPP) projects found to be working in Chhattisgarh.

2. CHHATTISGARH AGRICULTURE: PERFORMANCE AND CHALLENGES

In this section the performance and challenges in different sector of Chhattisgarh Agriculture have been observed i.e. structure, growth performance, drivers of growth, marketing and warehouse facilities, emerging demand and supply mechanics etc.

2.1 Structural Transformation of Chhattisgarh

The structural transformation the changing sectoral shares of the economy in Chhattisgarh state, the economic activities have been shown structural changes over a period of time and primary sector is experiencing a increased in terms of share in Gross State Domestic Products (GSDP) and Net State Domestic Product (NSDP). The sector-wise distribution of GSDP and NSDP in Chhattisgarh state at constant rate (2004-05) along with percentage distribution presented in tables 2.1 to 2.4.

The Gross domestic Product of Chhattisgarh state at constant price (2004-05) was found to be increased by 21.75% i.e. from Rs. 5859816 lakh (2006-07) to Rs. 7134262 lakh (2009-10). The tertiary sector (34.44%) increased at faster rate as compared to secondary sector (19.23%) and primary sector (10.88%) in this particular period (Table 2.1).

The primary sector was found to be increased by 10.88% i.e. from Rs. 1836872 lakh (2006-07) to Rs. 2036746 lakh (2009-10). In this sector fishing (22.13%) industries increased with faster rate as compared to mining (18.48%), agriculture (6.06%) and forestry (5.81%). The secondary sector was found to be increased by 19.42% i.e. from Rs. 2069351 lakh (2006-07) to Rs. 2471163 lakh (2009-10). In this sector electricity, gas & water supply (123.75%) changes with faster rate followed by construction (19.50%) and manufacturing (2.85%). The tertiary sector was found to increased by 34.44% i.e. from Rs. 1953594 lakh (2006-07) to Rs. 2626353 lakh (2009-10). In this sector contribution in transportation, communication & storage (37.23%) found to be change with faster rate as compared to banking industries & real-estate ownership dwelling (33.16%), trade hotel & restaurants (29.29%). In this period per capita income at constant rate increased by 15.29 % from Rs. 25258 (2006-07) to 28623 (2009-10).

The share of primary sector and secondary sector in GSDP has been found to be decreased from 31.35 (2006-07) to 28.55 per cent and 35.31 (2006-07) to 34.64 per cent (2009-10) respectively (Table 2.2), while the tertiary sector increased from 33.34 per cent (2006-07) to 36.81 per cent (2009-10).

Table 2.1 Contributions of different Sectors in GSDP at Constant Rate.

(lakh)

No.	Sector	2006-07	2007-08	2008-09	2009-10	Percentage change 2006-07		
						2007-08	2008-09	2009-10
1	Agriculture (Inclu. Animal Husbandry)	873831	974345	835891	926819	11.50	-4.34	6.06
2	Forestry & Logging	262794	273137	273002	278060	3.94	3.88	5.81
3	Fishing	60191	60898	69342	73514	1.17	15.20	22.13
4	Mining & Quarrying	640056	671729	740486	758353	4.95	15.69	18.48
A.	Primary Sector	1836872	1980108	1918721	2036746	7.80	4.46	10.88
5	Manufacturing	1290532	1453736	1489014	1327348	12.65	15.38	2.85
5.1	Manufacturing (Reg.)	1155549	1304310	1335891	1167433	12.87	15.61	1.03
5.2	Manufacturing (Un. Reg.)	134983	149426	153123	157915	10.70	13.44	16.99
6	Construction	574353	556165	595234	686329	-3.17	3.64	19.50
7	Electricity, Gas & Water Supply	204466	227750	497366	457486	11.39	143.25	123.75
B.	Secondary Sector	2069351	2237650	2581614	2471163	8.13	24.75	19.42
8	Transport, Communication & Storage	296819	333814	371151	407324	12.46	25.04	37.23
8.1	Railway	70727	73814	80957	91972	4.36	14.46	30.04
8.2	Transport	163381	185585	204699	220672	13.59	25.29	35.07
8.3	Storage	5513	6055	6749	7585	9.83	22.42	37.58
8.4	Communication	57198	68360	78746	87095	19.51	37.67	52.27
9	Trade Hotel & Restaurant	494142	556069	640277	638876	12.53	29.57	29.29
10	Banking-Insurance & Real-Estate Ownership Dwelling	524998	567975	619021	699108	8.19	17.91	33.16
10.1	Banking & Insurance	173825	198957	229633	294546	14.46	32.11	69.45
10.2	Real-estate & Ownership Dwelling	351174	369018	389388	404562	5.08	10.88	15.20
11	Community & Personal Services	637634	688760	767427	181045	8.02	20.36	-71.61
11.1	Public Administration	183538	187376	222301	261933	2.09	21.12	42.71
11.2	Other Services	454097	501385	545126	619113	10.41	20.05	36.34
C.	Tertiary Sector	1953594	2146618	2397876	2626353	9.88	22.74	34.44
	Grand Total	5859816	6364377	6898211	7134262	8.61	17.72	21.75
	Per Capita GSDP (In Rs.)	25258	26968	28623	29119	6.77	13.32	15.29

In the state GSDP of manufacturing sector (18.61%) contributed maximum share followed by agriculture (12.99 %), mining (10.63%), construction (9.62%), banking& insurance (9.80%), trade, hotel & restaurants (8.96%), electricity gas and water supply (6.41%), forestry & logging (3.90 %), transport (3.09%), community and personal services (2.54%), fishing (1.03 %), communication. & storage (0.11%), in the year 2009-10. (Table 2.2).

Table 2.2 Percentage Contributions of different Sectors in GSDP at Constant Rate.

Sector	2006-07	2007-08	2008-09	2009-10
Agriculture (Inclu. Animal Husbandry)	14.91	15.31	12.12	12.99
Forestry & Logging	4.48	4.29	3.96	3.90
Fishing	1.03	0.96	1.01	1.03
Mining & Quarrying	10.92	10.55	10.73	10.63
Primary Sector	31.35	31.11	27.81	28.55
Manufacturing	22.02	22.84	21.59	18.61
Manufacturing (Reg.)	19.72	20.49	19.37	16.36
Manufacturing (Un. Reg.)	2.30	2.35	2.22	2.21
Construction	9.80	8.74	8.63	9.62
Electricity, Gas & Water Supply	3.49	3.58	7.21	6.41
Secondary Sector	35.31	35.16	37.42	34.64
Transport, Communication & Storage	5.07	5.25	5.38	5.71
Railway	1.21	1.16	1.17	1.29
Transport	2.79	2.92	2.97	3.09
Storage	0.09	0.10	0.10	0.11
Communication	0.98	1.07	1.14	1.22
Trade Hotel & Restaurant	8.43	8.74	9.28	8.96
Banking-Insurance & Real-Estate Ownership Dwelling	8.96	8.92	8.97	9.80
Banking & Insurance	2.97	3.13	3.33	4.13
Real-estate & Ownership Dwelling	5.99	5.80	5.64	5.67
Community & Personal Services	10.88	10.82	11.13	2.54
Public Administration	3.13	2.94	3.22	3.67
Other Services	7.75	7.88	7.90	8.68
Tertiary Sector	33.34	33.73	34.76	36.81
Grand Total	100.00	100.00	100.00	100.00

As for as the Net State Domestic Product of Chhattisgarh state at constant price (2004-05) concerned it was also found to be increased by 18.37% i.e. from Rs. 5006477 lakh (2006-07) to Rs. 5926328 lakh (2009-10). The tertiary sector (34.36%) increased at faster rate as compared to secondary sector (10%) and primary sector (8.72%) in the year 2009-10 over the year 2006-07 (Table 2.3). The primary sector was found to be increased by 8.72% i.e. from Rs. 1613401 lakh (2006-07) to Rs. 1754095 lakh (2009-10). In this sector the change was found to be maximum in fishing (16.19%) followed by mining & quarrying (15.90%), forestry & logging (5.63%) and agriculture (4.68%) in the year 2009-10 as compared to 2006-07.

The secondary sector was found to be increased by 10% i.e. from Rs. 1587844 lakh (2006-07) to Rs. 1746667 lakh (2009-10). In this sector the change was found positive in all sectors i.e. electricity, gas & water supply (203.38%), construction (17.41%), except manufacturing (-8.58%) sector. The tertiary sector increased by 34.36% i.e. from Rs. 1805233 lakh (2006-07) to Rs. 2425566 lakh (2009-10). In this sector maximum change was found in

community & personal services (38.20%) followed by transport, communication & storage (38.14%), banking-insurance & real-estate ownership dwelling (32.88%) and trade hotel & restaurant, (29.16%). At constant price per capita income increased from Rs. 21580 (2006-07) to Rs. 24189 (2009-10) with 12.09% in the year 2009-10 as compared to 2006-07.

Table 2.3 Contributions of different Sectors in NSDP at Constant Rate. (lakh)

No.	Sector	2006-07	2007-08	2008-09	2009-10	Percentage change 2006-07		
						2007-08	2008-09	2009-10
1	Agriculture(Inclu. Animal Husbandry)	796216	891150	764903	833500	11.92	-3.93	4.68
2	Forestry & Logging	259748	270234	269384	274371	4.04	3.71	5.63
3	Fishing	51455	51689	58849	59786	0.45	14.37	16.19
4	Mining & Quarrying	505982	513021	542841	586438	1.39	7.28	15.90
A.	Primary Sector	1613401	1726093	1635977	1754095	6.98	1.40	8.72
5	Manufacturing	966800	1104456	1077915	883863	14.24	11.49	-8.58
5.1	Manufacturing (Reg.)	867401	992140	965395	770770	14.38	11.30	-11.14
5.2	Manufacturing (Un. Reg.)	99399	112316	112520	113093	13.00	13.20	13.78
6	Construction	549178	529410	566600	644778	-3.60	3.17	17.41
7	Electricity Gas & Water Supply	71866	65854	265475	218026	-8.37	269.40	203.38
B.	Secondary Sector	1587844	1699719	1909990	1746667	7.05	20.29	10.00
8	Transport, Communication & Storage	262291	297798	329024	362319	13.54	25.44	38.14
8.1	Railway	55228	58065	64189	77007	5.14	16.23	39.43
8.2	Transport	151851	172862	189141	202427	13.84	24.56	33.31
8.3	Storage	5290	5782	6433	7229	9.30	21.61	36.65
8.4	Communication	49922	61089	69261	75656	22.37	38.74	51.55
9	Trade Hotel & Restaurant	483727	544126	625527	624787	12.49	29.31	29.16
10	Banking-Insurance & Real-Estate Ownership Dwelling	476862	515361	560702	633671	8.07	17.58	32.88
10.1	Banking & Insurance	171152	196172	226694	290957	14.62	32.45	70.00
10.2	Real-estate & Ownership Dwelling	305711	319189	334008	342714	4.41	9.26	12.10
11	Community & Personal Services	582352	628117	704954	804789	7.86	21.05	38.20
11.1	Public Administration	146647	147436	184192	215654	0.54	25.60	47.06
11.2	Other Services	435706	480682	520762	589136	10.32	19.52	35.21
C.	Tertiary Sector	1805233	1985402	2220207	2425566	9.98	22.99	34.36
	Grand Total	5006477	5411215	5766174	5926328	8.08	15.17	18.37
	Per Capita GSDP (In Rs.)	21580	22929	23926	24189	6.25	10.87	12.09

The share of primary sector and secondary sector in NSDP has been found to be decreased from 32.23 per cent (2006-07) to 29.60 per cent (2009-10) and 31.72 per cent (2006-07) to 29.47 per cent (2009-10) respectively, while the tertiary sector increased by 36.06 per cent

(2006-07) to 40.93 per cent in the year (2009-10). In state NSDP the maximum contribution was found of manufacturing sector (14.91 %) followed by agriculture (14.06 %), construction (10.88 %), banking & insurance (10.69 %), trade & hotel (10.54 %), mining & quarrying, (9.90 %), transport & communication (6.11 %), forestry, (4.63 %), electricity, gas & water supply (3.68 %), forest & logging (4.63 %) and fishing, (1.01 %) in the year 2009-10. (Table 2.4)

Table 2.4: Percentage Contribution of different Sector in NSDP at Constant Rate.

Sector	2006-07	2007-08	2008-09	2009-10
Agriculture (Inclu. Animal Husbandry)	15.90	16.47	13.27	14.06
Forestry & Logging	5.19	4.99	4.67	4.63
Fishing	1.03	0.96	1.02	1.01
Mining & Quarrying	10.11	9.48	9.41	9.90
Primary Sector	32.23	31.90	28.37	29.60
Manufacturing	19.31	20.41	18.69	14.91
Manufacturing (Reg.)	17.33	18.33	16.74	13.01
Manufacturing (Un. Reg.)	1.99	2.08	1.95	1.91
Construction	10.97	9.78	9.83	10.88
Electricity, Gas & Water Supply	1.44	1.22	4.60	3.68
Secondary Sector	31.72	31.41	33.12	29.47
Transport, Communication & Storage	5.24	5.50	5.71	6.11
Railway	1.10	1.07	1.11	1.30
Transport	3.03	3.19	3.28	3.42
Storage	0.11	0.11	0.11	0.12
Communication	1.00	1.13	1.20	1.28
Trade Hotel & Res.	9.66	10.06	10.85	10.54
Banking-Insurance & Real-Estate ownership Dwelling	9.52	9.52	9.72	10.69
Banking & Insurance	3.42	3.63	3.93	4.91
Real-estate & Ownership Dwelling	6.11	5.90	5.79	5.78
Community & Personal Services	11.63	11.61	12.23	13.58
Public Administration	2.93	2.72	3.19	3.64
Other Services	8.70	8.88	9.03	9.94
Tertiary Sector	36.06	36.69	38.50	40.93
Grand Total	100.00	100.00	100.00	100.00

2.2 Growth Performance of Agriculture

The growth of area, production and yield of food grains, total cereals, total pulses and total oil seeds of Chhattisgarh in different five year plans has been analyzed and found that the growth of area found to be positive in all the plan periods except pulses in 9th plan (-1.85% per annum) and 11th plan (-1.99% per annum), total oilseed in 9th plan (-7.92% per annum) and 11th plan (-0.40% per annum), total food grains in 9th plan (-0.22% per annum) and 11th plan (-0.32% per annum). The growth of production was also found positive in all the plan periods, except total pulses in 9th plan (-2.33% per annum) and in 11th plan (-3.10% per annum), oilseeds

in 9th plan (-6.73% per annum). The productivity of all major crops were also found positive in all plans except cereals in 11th plan (-5.42% per annum), pulses in 9th plan (-11.25% per annum) and in 11th plan (-4.01% per annum). (Table 2.5).

Table 2.5: Growth of Area, Production and Yield in last 2 Decades (Plan Wise) of C.G.

Plans/Years	Total Cereals	Total Pulses	Total Oilseed	Total Food Grains
Area (000' ha)				
9th plan	0.10	-1.85	-7.92	-0.22
10th plan	0.26	3.13	3.94	0.77
11th plan	0.03	-1.99	-0.40	-0.32
Production (000't)				
9th plan	4.26	-2.33	-6.73	3.69
10th plan	11.53	3.88	9.83	10.89
11th plan	6.10	-3.10	0.86	5.31
Yield (kg/ha)				
9th plan	7.30	-11.25	2.66	1.84
10th plan	3.15	0.15	2.95	2.53
11th plan	2.76	-4.01	2.76	1.18

2.3 Drivers of Growth in Agriculture

Agriculture growth in any region can accrue because of growth in crop output, diversification of agriculture towards high value crops and live stock product and increase in value of the given output. Examining all these three aspects of agriculture growth in agriculture it is observed that the overall growth of agriculture production and productivity of the major crop in Chhattisgarh is quite impressive from 10th five year plan (Table 2.5). The implementation of National Food Security Mission and National Horticulture Mission has also emerged as a path of intervention which helps in agriculture diversification towards cash crops in the state.

The area and production of vegetable and fruits, spices, medicinal and aromatic plants have been increased in the state due to effective implementation of NHM. (Table 5.4) The growth of livestock sector is also seen high due to implementing Chhattisgarh State Livestock Development Agency, Control of Animal Diseases, Pig Rearing Farm (Jashpur), Goat Breeding Farm (Sarora and Rampure) given subsidy for bulls to cattle breed improvement programme with the help of cent per cent Central Government assistance schemes for farmers. So far as the increase in value of agriculture output is concern the farmers are able to get price of their product more than minimum support price because of effective procurement policy of the state government.

The growth of agriculture is also depends on infrastructure facility created in the state viz. road, power, agro based and other industries. The construction of roads in the state is supervise by Chhattisgarh Road Development Corporation Limited which implements projects taken up under public private partnership and those funded by Asian Development Bank. The state has 4 PPP projects in the road sector at various stages of development as of October 2012. The state has 11 national highways measuring 2226 KM and state highway of 5240 KM. The total road length is around 33449 KM. The state shows impressive progress in road development since 2000. The progress of agro based and other industry are also quite impressive due to state policy incentives. Chhattisgarh state industrial development corporation limited and its subsidiary *Chhattisgarh Audyogik Kendra Vikas Nigam* are the key nodal agency for the industrial development in the state. The state has received a national award- 'Krishi Karman Award' for highest productivity of rice in the year 2010-11. Rice mill Industries limited are the key partner of state government under agro based industries.

Length of Roads, Railways and Airport

Chhattisgarh has wide coverage of roads which have pan-nation connectivity. The district headquarters, tehsils and development blocks are well connected with good all-weather roads. 11 national highways passing through the state which are together 2226 km in length. This includes (National Highway) NH 6, NH 16, NH 43, NH 12 A, NH 78, NH 111, NH 200, NH 202, NH 216, NH 217, NH 221. The total length of roads network of 31803 km in the Chhattisgarh state while the state highways, major district roads and other district rural roads constitute another network of 5240, 10539 and 13798 km. (Table 2.6) Odisha, Andhra Pradesh, Maharashtra, Bihar, Madhya Pradesh and Jharkhand. Chhattisgarh's railways sector falls under the jurisdiction of the South East Central Railways. The state is well connected to the rest of the country via the railways. Raipur and Bilaspur are the two major railway stations. The significant mining and industrial activity in the state was a major reason behind the setting up of the South East Central Railways in 1998 with headquartered in Bilaspur.

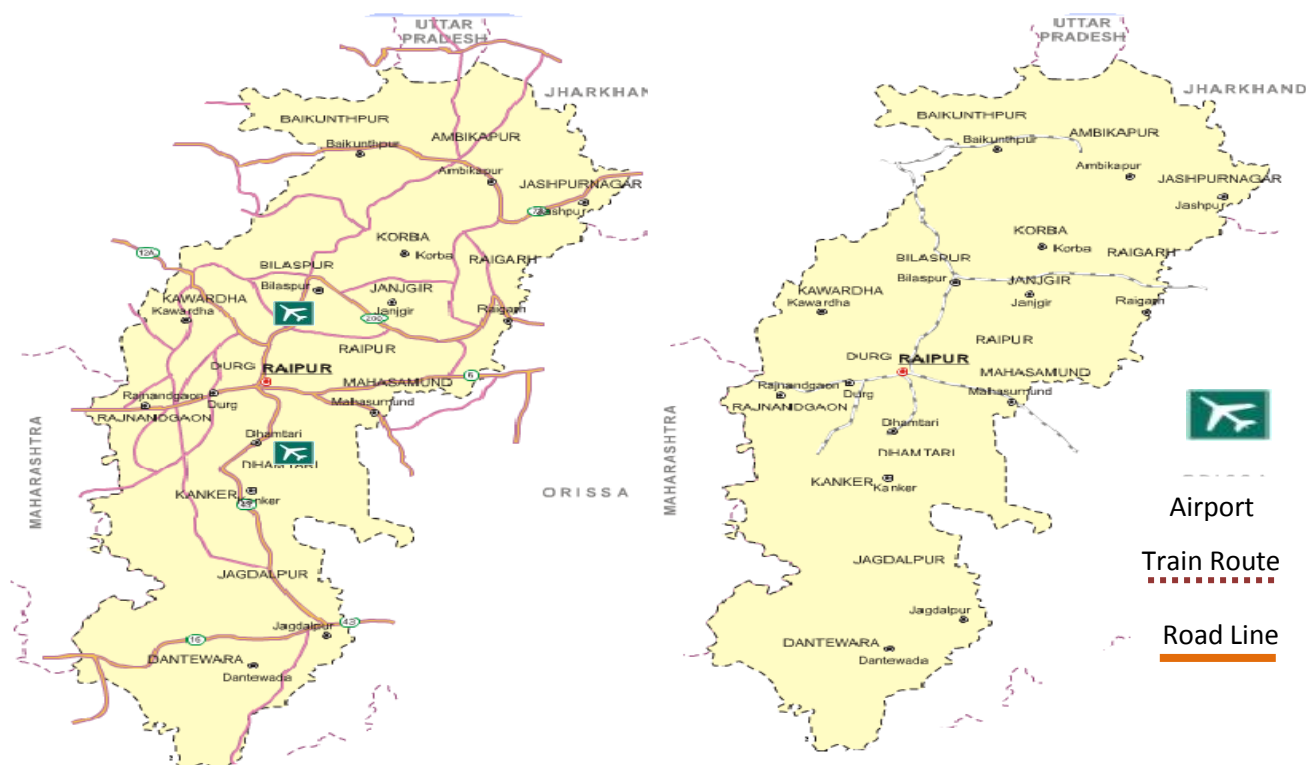


Fig. 8: Road and train Map of Chhattisgarh.

The state has the highest freight loading capacity in the country and one-sixth of Indian Railway's revenue comes from Chhattisgarh. The length of rail network in the state is 1,187 km. Direct trains to many cities like Ahmedabad, Allahabad, Varanasi, Bengaluru, Cochin, Pune and Hyderabad are available. The state has two domestic airports; one at Raipur and the other at Bilaspur. Chhattisgarh also has eight air strips located at Bhilai, Bilaspur, Korba, Raigarh, Jagdalpur, Ambikapur, Jashpur Nagar and Sarangarh. The Airport Authority of India (AAI) is mootting a plan to construct two new airports at Raigarh and Bilaspur in the state.

Table 2.6 : Length of Roads in Chhattisgarh State.

(KM)

Year	National Highways	State Highways	Major District Roads	Other District Rural Roads	Total Length of Roads (PWD)
2011-12	2226 (7.00)	5240 (16.48)	10539 (33.14)	13798 (43.39)	31803 (100.00)

Source- Chief Eng. Public Work Department, Chhattisgarh.

Electricity

The total installed capacity of power generation was 1,360 MW at the time of constitution of the Board, which has increased to 1924.70 MW during the last 12 years i.e. by the end of December, 2012. This comprises installed capacity of 1780 MW thermal power, 138.70 MW hydro power and 6 MW others (co-production). The plants of capacity of 1500MW is under construction by Chhattisgarh State Electricity Production Company of which installation of one unit of 500 MW for Expansion in Electricity production in Korba west expansion and 2 units of 500 MW each in village Madwa-Tendubhata of Janjgir Champa is under progress.

Due to continuous efforts, the electricity consumption in power plants of C.G. State Electricity Production Company engaged in electricity production, which was 10.35% in the year 2000 has been reduced to 9.46% in the year 2011-12. Plant utility component of thermal power houses in the year 2000-01 was 65.75 percent, which increased to 80.82 per cent by the year 2010-11. During this period, 12982.778 million units (thermal 12636.648, hydro 343.780 and other co-production 2.35) of electricity was produced, specific oil consumption was 0.79 milliliter per electric unit, specific coal consumption was 0.771 Kg per electric unit and plant electricity consumption was 9.46 percent.

2.4 Storage and Ware Housing

The head Quarter of Chhattisgarh State Warehousing Corporation is in Raipur. The maximum warehouses were found in Raipur (14), followed by Jagdalpur(11), Durg(10), Bilashpur (9), Kanker (8), Sarguja (8), Rajgarh (8), Dantewara (7), Janjgeer (6), Mahasamund (5), Rajnandgaon (5), Jashpurnagar (4), Koriya (4), Dhamtari (3), Kawardha (2) and Korba (2), There were found 106 warehouses with a capacity of 1044851 tons in which 51.11 % related to hired basis and 48.89 % owned (Table 2.7).

Table 2.7 : Warehouses Capacity in Chhattisgarh State. (Tons)

S.No.	Districts	Numbers	Storage Capacity		
			Owne Capacity	Hired Capacity	Total Capacity
1.	Raipur	14	107980	30458	138438
2.	Durg	10	83650	89311	172961
3.	Mahasamund	5	36720	66432	103152
4.	Dhamtari	3	25460	42207	67667
5	Kawardha	2	9200	13519	22719
6	Rajnandgaon	5	41742	14157	55899
7	Bilaspur	9	36400	27184	63584
8	Janjgir	6	30900	48649	79589
9	Korba	2	10000	5025	15025
10	Rajgarh	8	51600	36857	88457
11	Jas pur nagar	4	7600	11232	18832
12	Sarguja	8	18200	52923	70823
13	Koriya	4	4000	9908	13908
14	Jagdalpur	11	29600	42507	72107
15	Dantewara	7	8400	2600	11000
16	Kanker	8	9360	41370	50730
	Total	106	510812 (48.89)	534039 (51.11)	1044851 (100)

2.5 Cold Storages in Chhattisgarh State

There were found 47 total cold storage in Chhattisgarh with a capacity of 247837 tons. The maximum capacity was concerned with private sector (216025 tons) followed by public organization (41 tons) and cooperation sector (29 tons). The maximum capacity private sector used for multipurpose activities (216025 t) followed by storage of potatoes (31742 t), while public and cooperation sector used their capacity only for preservation of dairy products.

Table 2.8: Capacity of Cold Storages in Chhattisgarh State. (tons)

Sector	Capacity	Products Stored
Cooperative	29	Dairy Products
Public	41	Dairy Products
Private	31742	Potatoes
Private	216025	Multipurpose
Total	247837	

2.6 Rice Mills in Chhattisgarh

Chhattisgarh known for rice production. There are found 1312 rice mills. The maximum rice mills are found in Raipur (336) followed by Durg (167), Bilashpur (140), Mahasamund (124), Dhamtari (122), Raigarh (98), Rajnandgaon (66), Sarguja (61), Bastar (56), Kanker (45), Korba (37), Janjgir champa (21), Kabardha (19) Koriya (12) and Dantewara (08).

Table 2.9 : Rice Mills in Chhattisgarh State.

S. No.	Name of districts	No of Mills	Per cent to total
1	Sarguja	61	4.65
2	Raipur	336	25.61
3	Raigarh	98	7.47
4	Rajnand gaon	66	5.03
5	Mahasamund	124	9.45
6	Bilaspur	140	10.67
7	Bastar	56	4.27
8	Dhamtari	122	9.30
9	Durg	167	12.73
10	Dantewara	8	0.61
11	Janjgir champa	21	1.60
12	Koriya	12	0.91
13	Korba	37	2.82
14	Kanker	45	3.43
15	Kabardha	19	1.45
	Total	1312	100.00

2.7 Agricultural Marketing

The marketing of farm products mainly done by *Krishi Upaj Mandies* (Regulated Market) There has been special contribution of Krishi Upaj Mandies in well planned marketing of agricultural production. There are 73 Mandies and 112 Sub-Mandies functioning in Chhattisgarh (2011-12). The main purpose of there is to save the farmers from exploitation and provided them fair price of their agricultural produce with in time and furnish all the facilities of marketing. The inward arrival of 7368594 MT (2011) in Mandies of the State with income of Rs. 16413.46 lakh (2010-11) Mandi fees received from a prime source of income of the Board, which is paid by Mandies to the board as board fees.

Table 2.10 : Regulated Market in different District of Chhattisgarh. (Numbers)

S.No.	Districts name	Grades of Mandi			
		A	B	C	D
1	Raipur	2	3	2	-
2	Balodabajhar	1	2	2	-
3	Gariaband	-	1	2	-
4	Mahasamund	-	9	3	-
5	Dhamtari	7	5	-	-
6	Durg	3	-	-	-
7	Balod	3	-	-	-
8	Bemetra	-	6	-	-
9	Rajnadgaon	1	-	6	-
10	Kabirdham	-	1	1	-
11	Bilaspur	4	-	2	2
12	Mugeli	-	1	1	-
13	Jajgir-chmpa	1	1	2	3
14	Ktgora	-	-	1	-
15	Raigarh	1	3	1	1
16	Sarguja	-	-	5	1
17	Surajpur	-	-	1	1
18	Balrampur	-	-	-	2
19	Jaspur	-	-	1	3
20	Korea	-	-	-	2
21	Bastar	8	-	-	-
22	Kongadav	-	-	9	-
23	Kanker	-	-	8	-
24	Dantewada	-	-	1	-
25	Sucomma	-	-	1	-
26	Narayanpur	-	1	-	-
27	Bijapur	-	-	-	2
Total	Chhattisgarh State	31	33	49	17

These Mandies are classified in different categories on the basis of total arrivals. i.e Grade 'A' (>40 lakh t), Grade 'B' (>20 lakh t), Grade 'C' (>10 lakh t) and Grade 'D' (>5 lakh

t). The maximum mandies and sub-mandies were found of grade ‘C’ (49) followed by ‘A’ (31), ‘B’ (37) and ‘D’ (17) grades.

2.8 Emerging Demand and Supply Mechanics

With the change in taste and preferences of consumers and higher demand of vegetables, fruits, livestock products, eggs and oilseeds, as compared to cereals there is in increasing pressure on the prices of high value commodity. In Chhattisgarh consumption of cereals was found in large quantity (22.267 kg/capita/month) as compared to other food items. In cereals consumption of rice was found to be more consumed than wheat (18.74 kg/capita/month), vegetable (9.32 kg/capita/month), liquid milk (3.66 litre/capita/month), total pulses (1.18 kg/capita/month), edible oil (0.30 kg/capita/month), banana (5.44 kg/capita/month), eggs (2.38 No/capita/month), fish (0.24 kg/capita/month), chicken (0.37 kg/capita/month), goat meat/mutton (0.059 kg/capita/month) and electricity (31.79 kwh /capita/month) were found to consumed in small quantity, which was far away from the actual requirement of these items. Thus, there has been increase in demands in agro process foods in the state in future. Though, the state has made remarkable efforts for development of agro based industry in the state. That will be help to fulfill emerging demand of households.

3. NATURAL RESOURCE MANAGEMENT

The Chhattisgarh State divided into 3 Agro-Climatic Zones based on the different Agro Climatic factors. i.e. rainfall and Soil, available of irrigation.

1. The Chhattisgarh Plains is an increase in soil depth, water holding capacity, cation exchange capacity and preponderance of calcium and magnesium ions. The covered area about 50 per cent in this zone. The soil so developed have been classified in to four soil orders that widely differ in their production potential and physical characteristics. They are locally called, bhata (Entisols), matasi (Inceptisols), dorsa (alfisols) and kanhar (vertisols).



Fig. 9: Agro-Climatic Zones of Chhattisgarh

2. The Bastar Plateau the land is undulating and hence the soils vary considerably from top of the hillock to the valley. They covered was 29 per cent area by this zone. The soil type in Bastar vary from Marhan (Entisols) to Gabhar (Vertisols). Gabhar is the valley portion of the undulating terrain. In between these two Tikra (Inceptisols) and Mal (Alfisols) soil exist.
3. The Northern Hills most common soils are described locally on account of their occurrence, management and physical properties. These region covered are 21 per cent of the total geographical area. These are eroded hilly soils which are covered mostly by forest, Goda/Tikra (light soils), Goda Chawar (Medium), Chawar and Bahra soils. Chawar soils are found in low land bunded fields where rice is grown. In bahra soils (extreme lowlands) water flows continuously till January.

Table 3.1 : Agro-Climatic Zone and Districts /Tehsils covered in Chhattisgarh. (lakh ha.)

Agro Climatic Zone	Districts Covered	Total Geo. Area
C.G. Plains	Raipur, Gariyaband, Balodabazar, Mahasamund, Dhamtari, Durg, Balod, Bemetara, Rajnandgaon, Kabirdham, Bilaspur, Mungeli, Korba, Janjgeer, Raigarh & a part of Kanker Districts (Narharpur & Kanker Block)	69.49 (50%)
Bastar Plateau	Jagdapur, Narayanpur, Beejapur, Kondagaon, Dantewada, Sukma and the remaining part of Kanker Districts	39.94 (29%)
Northern Hills	Sarguja, Surajpur, Balrampur, Korja, Jashpur & Dharamjaigarh Tehsil of Raigarh Districts	28.47 (21%)
	Total	137.90 (100)

Source :Govt of Chhattisgarh, March 2012 (National Conference on Agriculture). Figures in parenthesis show percentage to total.

3.1 Land Use Pattern

The total geographical area of the state is around 13790 thousand ha. The contribution of forest (45.95 per cent) area was found to be maximum in total geographical area followed by net area sown (34.06 per cent), area not available for cultivation (7.39 per cent), other cultivated land excluding waste land (2.57 per cent), current fallow land (1.83 per cent), land other than current fallow land (1.99 per cent), permanent pastures & other grazing lands (6.20 per cent). The land put under miscellaneous tree crops and groves (0.01 per cent), area sown more than once (7.07 per cent), land put under culturable fallow and & un-culturable land uses (8.78 per cent). The gross cropped area was found to be increased by 41.13 per cent in the year 2010-11 as compared to 2000-01. The maximum change is found in current fallow (15.06 per cent) followed

by gross cropped area (6.48%), land not available for cultivation (0.59%) forest (0.52%) permanent pastures & other grazing land (0.23%). The change in land under misc. tree crops/cultivable waste land (-99.70%), land put under current fellow (-9.64%), and net area sown (-1.39 %) found to be decreases in the year 2010-11 as compared to 2000-01. The cropping intensity of Chhattisgarh was found to be changed by 9% increased in the year 2010-11 which was mainly due to increased in double cropped areas 72.87% in Chhattisgarh. (Table 3.2)

Table 3.2 : Land Use Pattern of Chhattisgarh State. (000' ha.)

Particulars	2000-01	2010-11	Absolute Change	Relative Change %
1. Geographical area	13787 (100)	13790 (100)	3	0.02
2. Forests	6303 (45.72)	6336 (45.95)	33	0.52
3. Land not available for cultivation	1013 (7.35)	1019 (7.39)	6	0.59
4. Culturable fallow and & Un-culturable land	1189 (8.62)	1211 (8.78)	22	1.85
A. Permanent pastures & other grazing lands	853 (6.19)	855 (6.20)	2	0.23
B. Land under misc. tree crops & groves./ Cultivable waste Land	336 (2.44)	1 (0.01)	-335	-99.70
5. Land available for cultivation	NA (00.00)	355 (2.57)		
6. Fallow Land	519 (3.76)	528 (3.83)	9	1.73
A. Current fallows.	280 (2.03)	253 (1.83)	-27	-9.64
B. Land Other than current Fallow.	239 (1.73)	275 (1.99)	36	15.06
7. Net area sown.	4763 (34.55)	4697 (34.06)	-66	-1.39
8. Area sown more than once.	564 (4.09)	975 (7.07)	411	72.87
9. Gross Cropped Area.	5327 (38.64)	5672 (41.13)	345	6.48
10. Cropping intensity %	112	121	9	

Source : Chhattisgarh at a glance 2011.

3.2 Soil types

The soil types are diverse because of the topographical variations in Chhattisgarh. In the upper part of the landscape, the soils are usually shallow and young, with less developed features, and are frequently highly eroded. The soils of Chhattisgarh are classified into five major orders (Table 3.3). Entisols are extremely shallow, very well drained, and sandy-loam in texture.

The shallow depth, low water holding capacity, poor physical condition and low soil fertility are the major constraints to their use for productive cropping. The major soil type are covered area in the state is 549.96 thousand ha, which comprises 39 per cent Inceptisol (Matasi-Sandyloam), 12 per cent Entisol (Bhata-gravelly) 1 per cent Bharri soil respectively. Alfisols are medium deep, well drained, clay-loam soils on gently sloping undulating to rolling plateau with moderate erosion hazards, usually occurring on the mid-slopes. They covered are 27 per cent Alfisols (Dorsa-clayloam), Vertisols are deep, moderately well drained, clayey soils, mostly occurring in the lower parts of the very gently sloping, 21 per cent area were covered of vertisol, undulating plateau with a low erosion hazard. The soils have good water holding capacity and possess considerable crop production potential.

Table 3.3 : Soils of Chhattisgarh state.

Type of Soils	Area ('000 ha)	Per cent of total
1. Inceptisol (Matasi-Sandyloam)	214.49	39
2. Alfisols (Dorsa-clayloam)	148.49	27
3. Vertisols (Kanhra-clayey)	113.78	21
4. Entisol(Bhata-gravelly)	65.99	12
5. Bharri	7.21	1
Total	549.96	100

Source: Agricultural Statistics, 2010, Directorate of Agriculture, Govt. of Chhattisgarh

3.3 Land Ceiling Limit

The ceiling limits of land holding in Chhattisgarh is found to be at par with the limit suggested in the national guidelines of 1972 i. e. 7.28 ha., 10.93 ha. and 21.85 ha. respectively for land holding irrigated with two crops, irrigated with one crop and dry land.

Table 3.4: Ceiling Limits on Land Holdings. (ha.)

Particulars	Irrigated with two crops	Irrigated with one crop	Dry land
Suggested in National Guide-lines of 1972	4.05 to 7.28	10.93	21.85
Actual Ceilings			6.74
Chhattisgarh	7.28	10.93	21.85

3.4 Operational Land Holding

The total number of land holding have been found 3461 thousand and with the area of 5210 thousand ha. (2010-11). In these holdings the area maximum number of holding were found to be related to marginal (55.40%) followed by small (21.96%), semi-medium (14.94%), medium (6.67%) and large (0.98%), while semi medium (26.79%) holding followed by Medium (25.47%), small (20.67%), marginal (16.14%) and large (10.92%) size of holdings.

Table 3.5: Land Holding in Chhattisgarh State.

(Area in 000' ha and Number in 000')

Operational Holdings		No.	%	Area	%
1	Marginal (0.5 to 1.0 ha.)	1919	55.45	841	16.14
2	Small (1.0 to 2.0 ha.)	760	21.96	1077	20.67
3	Semi Medium (2.0 to 4.0)	517	14.94	1396	26.79
4	Medium (4.0 to 10.0)	231	6.67	1327	25.47
5	Large (Over to Hundred)	34	0.98	569	10.92
Total		3461	100.00	5210	100.00

Source : Chhattisgarh at a Glance 2011

3.5 Water

Chhattisgarh is an agriculture dominant state. There by the implementation of irrigation schemes has been given high priority by the government of Chhattisgarh. The State to bring irrigation at par with national average (48.90.63 m.c.m) estimates by the various sources of water in Chhattisgarh state. Where in surface water availability is estimates (48296 m.c.m) and ground water availability is (14548 m.c.m). estimated. High priority was given to development of water resources and efforts for enhancement of irrigation potential in the State during the year 2008-09. The created irrigation potential and total irrigation was built up in 0.20, 18.09 lakh ha. in the year 2010-11. According to the Report of Central Ground Water Board, there are huge possibilities of ground water sources in Chhattisgarh. The government increased budget allotment up to 1479.12 % to created potential of irrigation in Chhattisgarh with the affords made by government the irrigation potential increased to 37.49 % of (8.68 lakh ha) in irrigation in the year 2010-11 with compared to 2000-01. (Table 3.7).

Table 3.6: Irrigation Potential and Successive Growth in Chhattisgarh State.

Period	Nov., 2000 to March, 2001	April, 2010 to March, 2011	Absolute Change	Relative Change
Budget Allotment (in crores.)	111.57	1761.82	1650.25	1479.12
Created Irrigation Potential (ha.)	12000	20000	8000	66.67
Total Irrigation (lakh ha.)	13.4	18.09	4.69	35.00
Percentage of Irrigation	23.15	31.83	8.68	37.49

Source: economic survey 2012-13

3.6 Weather and Climate

The climate of Chhattisgarh is tropical. It is hot and humid because of its proximity to the tropical of cancer and its dependence on the monsoon for rains. In the temperature varies between 30 and 45°C (86 and 113°F) in summer and 0°C and 25°C (32 and 77°F) during winter.

Table 3.7: Rainfall Pattern of Chhattisgarh State. (Last decade)

(mm)

Month	2011	%
June	176.6	14.56
July	277.1	22.84
August	364.7	30.06
September	391	32.23
October	3.9	0.32
Total	1213.3	100.00

Source : Directorate of Agriculture CG.

However, extremes in temperature can be observed with scales falling to less than 0°C to 49°C. The monsoon season is from late June to October and receives an average of 1213.3 mm of rainfall. The maximum rainfall in the month of September (32.23%) followed by August (30.06%), July (22.84%) and June (14.56%) Winters are pleasant with low temperatures and less humidity.

4. FARM INPUT: REQUIREMENTS, AVAILABILITY & PRICE

In present scenario the rate of distribution of seeds, seed replacement rate, fertilizer distribution and consumption, plant protection coverage, farm machinery, agriculture credit have found been increased in the state. The infrastructure facilities such as storage and warehousing, length of roads and consumption of electricity have also been found to be increased in Chhattisgarh.

4.1 Distribution of Certified Seed

The total distribution certified seeds was found to be increased 948.92 per cent in 2010-11 (685466 qt) as compared to 2000-01 (65350 qt). The percentage increased in seeds distribution was found to be more in Kharif season (998.23%) as compared to total Rabi crops (720.41%). In Rabi season the maximum change increased of distribution of oilseeds observed (1664.26%) followed by pulses (1346.10%) and cereals (532.82%), while in *Kharif season*. The maximum change was observed in oilseeds (1500.06%) but followed by cereals (981.45%), and pulses (211.24%).

Table 4.1: Distribution Certified Seed of different Crops in Chhattisgarh State. (qt)

Crop	2001	2011	Absolute Change	Relative Change %
Cereal	46503	502906	456403	981.45
Pulses	2313	7199	4886	211.24
Oilseeds	4933	78931	73998	1500.06
Total Kharif	53749	590290	536541	998.23
Cereal	9028	57131	48103	532.82
Pulses	2310	33405	31095	1346.10
Oilseed	263	4640	4377	1664.26
Total Rabi	11601	95176	83575	720.41
Total	65350	685466	620116	948.92

Source : Directorate of Agriculture, C.G. Raipur

4.2 Seed Replacement Rate

As regards to seed replacement rate the seed replacement rate was found maximum in Soybean (64.24%), followed by paddy (34.33%), til (22.39%), maize (21.23%), arhar (20.78%), urd (8.05%), moong (3.65%) and groundnut (3.37%) in Kharif season 2010-11. In Rabi season seed replacement was found maximum in wheat (36.42%) followed by mustard (46.9%), kusum (44.22%), gram (17.72%), masoor (2.58%), pea (1.97%) and alsi (0.78%) during 2010-11. The seed replacement rate of all crops found to be increased manifold as compared to 2000-01.

Table 4.2: Seed Replacement Rate in Chhattisgarh State. (%)

Crop	2001	2011
Kharif		
Soybean	6.92	64.44
Paddy	1.64	34.33
Til	0.25	22.39
Maize	2.38	21.23
Arhar	5.7	20.78
Urd	0.25	8.05
Moong	3.16	3.65
Groundnut	0	3.37
Rabi		
Wheat	8.77	36.42
Mustard	0.57	46.9
Kusum	9.12	44.22
Gram	2.35	17.72
Masoor	0	2.58
Pea	0.72	1.97
Alsi	0	0.78

Source : Directorate of Agriculture, C.G. Raipur

4.3 Fertilizer Distribution and Consumption

The distribution of fertilizer in Kharif season has been found to be increased 64 per cent Chhattisgarh in the year 2010-11 (388559 t) as compared to 2000-01 (236839 t), while the distribution of fertilizer in Rabi season has been found to be increased by 689.37% as compared to 2000-01 (15808 ton). Amongst all the major element of fertilizer the maximum change was observed in K (830.90%) fertilizer nutrient as compared to N (684.29%) fertilizer nutrient and P (663.54%) in Rabi season, while in Kharif the maximum increased was found in P & K (76.88%) as compared to N (55.95%) fertilizer nutrient.

Table 4.3: Fertilizer Distribution and Consumption in Chhattisgarh State. (t)

Element	Kharif				Rabi			
	2001	2011	Absolute Change	Relative Change%	2001	2011	Absolute Change	Relative Change%
Nitrogen	155658	242747	87089	55.95	9527	74719	65192	684.29
Phosphate	64452	114002	49550	76.88	5022	38345	33323	663.54
Potash	16729	31810	15081	76.88	1259	11720	10461	830.90
Total	236839	388559	151720	64.06	15808	124784	108976	689.37
Consumption in Kg/ha								
Nitrogen	34.95	51	16.05	45.92	9.85	42.97	33.12	336.24
Phosphate	13.83	23.95	10.12	73.17	4.91	22.05	17.14	349.08
Potash	3.52	6.68	3.16	89.77	1.28	6.74	5.46	426.56
Total	52.3	81.63	29.33	56.08	16.03	71.76	55.73	347.66

Source : Directorate of Agriculture, C.G. Raipur

The per kg p consumption was also observed in both the seasons and found that the per kg nutrients has been increased more in Rabi season as compared to Kharif season. The farmers of Chhattisgarh used only 29.33 kg/ha fertilizer in Kharif season and 55.73 kg/ha in Rabi season. The average consumption of these nutrients was found below as compared to the average fertilizer consumption of India (165.58 kg N, 80.5 kg P and 35.14 kg K in the year 2011).

4.4 Farm Machinery

The distribution of total farm machinery in Chhattisgarh state was also found to be increased by 18.86 per cent as compared to 2001-02 (28378). Amongst all the machinery the distribution of power drawn implements (9914.28 %) was found more as compare to power tiller 8 H.P. (4526.92 %), tractors (120.50 %). The bullock operated implements has been found to decreased by -13.74 % in 2011-12 as compared to 2001-02.

Table 4.4: Farm Machinery Distribute in Chhattisgarh State.

(Numbers)

S. No	Distribution of Machinery	2001-02	2011-12	Absolute Change	Relative Change %
1	Tractor	317	699	382	120.50
2	Power Tiller 8 H.P.	26	1203	1177	4526.92
3	Power drawn implements	77	7711	7634	9914.28
4	Hand/Bullock drawn implements	27958	24117	-3841	-13.74
	Total	28378	33730	5352	18.86

Source : Directorate of Agriculture, C.G. Raipur

4.5 Irrigated Area

The net and gross irrigated area has been found to be increased by 43.80 and 58.01 per cent in the year 2010-11 (1415, 1648 thousand ha.) as compared to year 2000-01 (984, 1043 thousand ha.).

Table 4.5: Source wise Irrigated area in Chhattisgarh State.

(000'ha)

Category	2001-02	2011-12	Absolute Change	Relative change%
Tube-wells	131	383	252	192.37
Canals	678	873	195	28.76
Wells	39	20	-19	-48.72
Ponds /tank	55	54	-1	-1.82
Other sources	81	85	4	4.94
Net irrigated area	984	1415	431	43.80
Gross irrigated area	1043	1648	605	58.01
% of net irrigated area to net area sown	20.7	30	9.3	
% of gross irrigated area to gross area sown	19.6	29	9.4	

Source : Directorate of Agriculture, C.G. Raipur

Amongst all the sources of irrigation the maximum change was found in tube well (192.37%) followed by canal (28.76%), and other sources (4.94%). The area irrigated by wells and ponds was found to be decreased by -48.72% and -1.82% in the year 2010-11 as compared to 2000-01. (Table. 4.5)

As regards crop wise irrigated area, the change in irrigated area was found more in Rabi season (138%) as compared to Kharif season (16%). Amongst all the crops the maximum change was found in soybean (2242.25%) as compared to gram (1997.04%), maize (616.06%), lentil (241.54%), sunflower (228.13%), summer paddy (170.80%), green/black gram (166.67%), sugarcane (166.33%), pea (149.10%), mustard (136.83%), wheat (65.35%) and vegetables & other crops (18.47%) and paddy (15.38%). The irrigated area in groundnut was found to be decreased by -2.85% in 2010-11 as compared to 2000-01. (Table. 4.6)

Table 4.6: Crop wise Irrigated area in Chhattisgarh State.

(ha.)

Crops	2000-01	2010-11	Absolute Change	Relative Change%
Rabi				
Paddy	52384	141858	89474	170.8
Wheat	46158	76324	30166	65.35
Gram	4229	88684	84455	1997.04
Green/ Black gram	1161	3096	1935	166.67
Pea	1112	2770	1658	149.1
Lentil	65	222	157	241.54
Sugarcane	5525	14715	9190	166.33
Mustard	1420	3363	1943	136.83
Sunflower	1063	3488	2425	228.13
Vegetables & other crops	53703	63624	9921	18.47
Total	166820	398144	231324	138.67
Kharif				
Paddy	1026781	1184708	157927	15.38
Maize	928	6645	5717	616.06
Groundnut	4355	4231	-124	-2.85
Soybean	71	1663	1592	2242.25
Total	1032135	1197247	165112	16
Gross Cropped Area	1198955	1595391	396436	33.07

Source : Directorate of Agriculture, C.G. Raipur

4.6 Agriculture Labour and wage rates

The wages of agriculture labour are varied from Rs. 100 (2010) to Rs. 135 (2011). The prevailing labour charges of agriculture operations are varied with the operations of cultivations of crops i.e. ploughing, leveling, weeding, transplanting, harvesting and winnowing. The actual wage rates of agriculture labour varied from Rs. 152 to 200 per man day in different operations of the crops. The rates are higher in peak operation periods i.e. ploughing of seeds and harvesting of crops. After the implementation of MNREGA in 2006 the availability of agricultural labour has found to be reduced considerably at the time of peak operation periods. The wage rates of agriculture labour of various agricultural operations have remarkably increased after implementation of MNREGA in the state.

4.7 Agricultural Credit

The share capital of District Cooperative Central Banks was reached to Rs. 19014.31 lakh in the year 2011-12, in which contribution of the State Govt. was Rs. 1311.7 lakh. The District Cooperative Central Banks were followed by distributed loans of Rs. 192426.50 lakh, in which short term loan of Rs. 181693.50 lakh and medium term loan of Rs. 10733.00 lakh. The shared capital of Primary Agriculture Credit Societies was found to be Rs. 14347.03 lakh. The Primary Agriculture Credit Societies were distributed Loans of amount Rs. 99696.60 lakh to the farmers

in which Rs. 97714.26 lakh of short term loan and Rs. 1982.34 lakh of medium term loan (2011-12). The shared capital of District Co-operative Agriculture and Rural Development Banks was Rs.1352 lakh (2011-12) in which contributed of the state govt. Rs. 458.05 lakh. The total loan distributed was Rs. 128.97 lakh in which Rs. 29.52 lakh of short term loan and Rs.99.45 lakh medium term loan.

Table 4.7 : Agriculture Credit in Chhattisgarh State. (2011-12). (lakh)

Particular	District Co-operative Central Banks	Primary Agriculture Credit Societies	District Co-operative Agriculture and Rural development Banks
Share Capital-(1) Total	19014.31	14347.03	1352
(2) Govt.	1311.7	NA	458.05
Total Loan Distribution	192426.5	99696.60	128.97
(B) Short Term	181693.5	97714.26	29.52
(c)Middle term	10733	1982.34	NA
Long term loan	NA	NA	99.45

Source- Commissioner, Registered Co-operative Institutions, Chhattisgarh.

5. MAJOR CROPS OF CHHATTISGARH–AREA, PRODUCTION & YIELD

The various crops are grown by the cultivators in Chhattisgarh. The rice (68.8%) was found to be major crop of the state. The cultivators are also found to be grown tiwra (6.5%), gram (4.6%), paddy (2.6%), kodo-kutki (2.3%) and wheat (1.9%). The maize, urd, niger, soybean, arhar, mustard, kulthi, als, groundnut, til, masoor, pea, moong, moong, jwar, urd, sunflower, kulthi and safflower are also grown in small proportion by the cultivators in the state.

5.1 Changes in Cropping Pattern

The change in cropping pattern of Chhattisgarh presented in table 5.1 It is observed from the data that gross cropped area of Chhattisgarh has been found to be increased by 5.7 per cent in the year 2010-11 (5506.6 thousand ha.) over the year 2000-01 (5207.4 thousand ha.). The area was found to be increased under rabi crops (39.0%) and kharif crops (0.4%). The area under pulses, oilseeds and cereals found to be increased by 31.5, 10.0 and 1.4 per cent during this period. As regards to the change in area under different crops the cultivated, area under soybean (448.3%) increased maximum followed by sunflower (288.5%), summer paddy (175.3%), gram (81.0%), pea (60.2%), rabi moong (45.4%), tiwra (43.2%), wheat (33.2%), niger (28.9%), masoor (27.8%), maize (10.0%), other kharif cereals (10.5%), arhar (10.3%), other kharif pulses (8.6%), mustard (4.4%), and rice, (1.9%), while the area under barley & other (-90.3%), rabi als

(-58.4%), kharif kodo-kutki (-46.1%), jwar (-40.0%), rabi kulthi (-39.5%), sunflower & others (-38.6%), kharif kulthi (-20.8%), rabi urd (-17.3%), til (-16.1%), safflower (-15.8%), groundnut (-13.5%), kharif urd (-12.4%) and kharif moong (-7.0%), were found to be decreased in the year 2010-11 as compared to 2000-01.

5.2 Changes in Production

The total production of kharif crops in Chhattisgarh found to be decreased by 159.5 per cent in the year 2010-11 (7776.9 thousand t) over the year 2000-01 (2997.1 thousand t), while the total production of Rabi crops increased with 222.9 per cent. The production of cereals, pulses and oilseeds was found to be increased by 167.5, 106.1 and 95.5 per cent. As regards to production of all major crops the production summer paddy (1384.0%), niger (754.8%), gram (232.2%), rice (163.50%), tiwra (105.4%), soybean (73.4%), til (73.9%), rabi moong (71.3%), wheat (53.2%), Pea (49.5%), masoor (47.1%), maize (47.8%), jwar (44.6%), sunflower (21.8%), rabi groundnut (16.8%), arhar (12.8%) and kharif moong (11.3%), was found to be increased while, the production of linseed (-58.2%), kulthi (-37.1%), kharif kulthi (-23.4%), mustard (-21.8%), safflower (-17.2%), kodo-kutki (-16.8%), rabi urd (-11.2%), kharif urd (-10.0%) and other cereals (-3.1%), was found to be decreased in the year 2010-11 as compared to 2000-01 (Table 5.2).

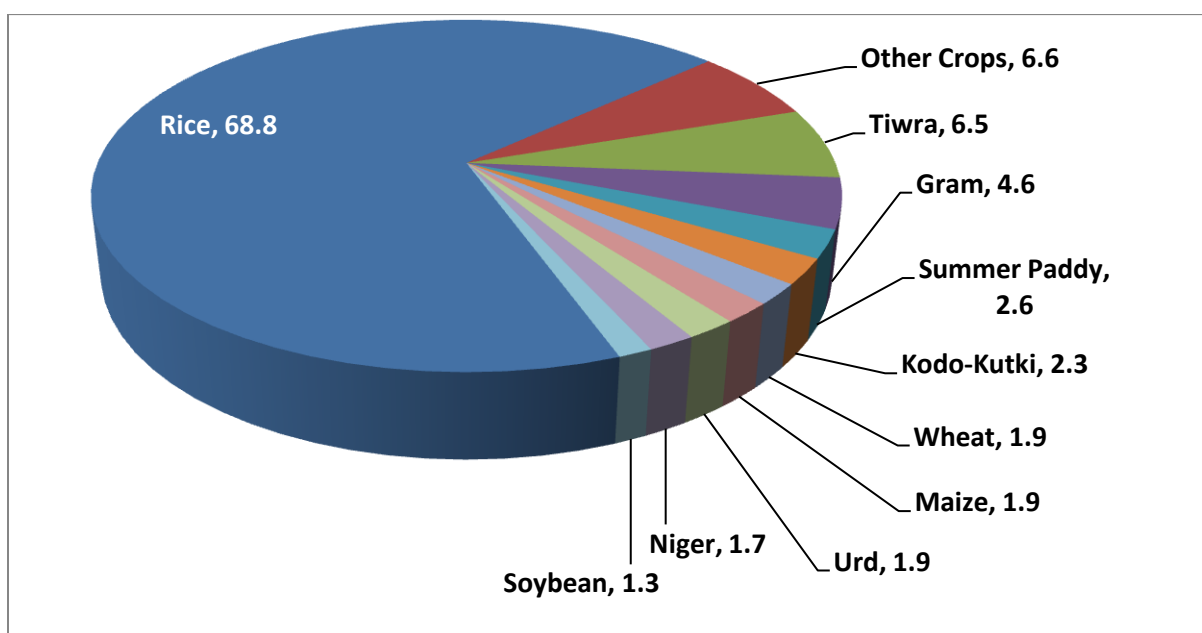


Fig 10: Percentage Area under Crops in Chhattisgarh (2010-11).

5.3 Changes in Productivity

The productivity of all the crops have been found to be increased in 2010-11 as compared to 2000-01, excepted soybean (-68.4%), rabi sunflower (-68.6%), and kharif Cereals (-48.2%), mustard (-25%), Pea (-6.4%), kharif kulthi (-3%) and safflower (-0.7%). The maximum increased in productivity of crops was noticed in niger (563.3%) followed by rice (178.4%), summer paddy (164.1%), jwar ((117%), sunflower & others kharif (114.2%), til (101.2%), gram (83.5%), kodo-kutki (54.5%), tiwra (43.5%), groundnut (35.1%), maize (34.4%), rabi moong (17.7%), wheat (15%), masoor (15.1%), kharif moong (8.2%), rabi urd (7.5%), rabi kulthi (4.3%), kharif urd (2.8%), arhar (2.3%), and linseed (0.4%) during the period (Table 5.3).

Table 5.1: Cropping Pattern of Chhattisgarh State.

(000' ha)

Crops	2000-2001	2011	Absolute Change	Relative Change %
Rice	3718.2	3787.7	69.5	1.9
Jwar	8.7	5.2	-3.5	-40.0
Maize	93.4	102.7	9.3	10.0
Kodo-Kutki	237.7	128.1	-109.6	-46.1
Other Cereals	35.4	39.1	3.7	10.5
Total Cereals	4093.3	4062.8	-30.5	-0.7
Arhar	49.4	54.5	5.1	10.3
Moong	9.8	9.2	-0.7	-7.0
Urd	116.7	102.3	-14.4	-12.4
Kulthi	61.6	48.8	-12.8	-20.8
Other Pulses	6.2	6.7	0.5	8.6
Total Pulses	243.7	221.4	-22.3	-9.2
Groundnut	34.2	29.6	-4.6	-13.5
Til	24.1	20.2	-3.9	-16.1
Soybean	12.7	69.4	56.8	448.3
Niger	74.3	95.8	21.5	28.9
Sunflower & Others	0.4	0.3	-0.2	-38.6
Total Oilseeds	145.7	215.2	69.6	47.8
Total Kharif	4482.7	4499.4	16.8	0.4
Wheat	77.8	103.7	25.9	33.2
Summer Paddy	51.5	141.9	90.3	175.3
Barley & Other	28.8	2.8	-26.0	-90.3
Total Cereals	158.2	248.4	90.2	57.0
Gram	140.1	253.5	113.4	81.0
Pea	8.9	14.2	5.3	60.2
Masoor	12.6	16.1	3.5	27.8
Moong	4.9	7.1	2.2	45.4
Urd	5.2	4.3	-0.9	-17.3
Kulthi	3.5	2.1	-1.4	-39.5
Tiwra	250.8	359.2	108.4	43.2
Other Pulses	0.0	2.6	2.6	0.0
Total Pulses	425.9	659.1	233.2	54.7
Mustard	48.2	50.3	2.1	4.4
linseed	90.5	37.6	-52.9	-58.4
Safflower	1.0	0.8	-0.2	-15.8
Sunflower	1.0	4.0	3.0	288.5
Sesamum	0.0	0.3	0.3	0.0
Groundnut	0.0	6.6	6.6	0.0
Other Oilseed	0.0	0.1	0.1	0.0
Total Oilseed	140.6	99.8	-40.9	-29.1
Total Rabi	724.7	1007.2	282.5	39.0
Gross Cropped Area	5207.4	5506.6	299.2	5.7
Total Cereals	4251.5	4311.2	59.7	1.4
Total Pulses	669.6	880.5	210.9	31.5
Total oilseeds	286.3	315.0	28.7	10.0

Source : Directorate of Agriculture, C.G. Raipur

Table 5.2: Production of different Crops in Chhattisgarh State.

(000' ton)

Crops	2000-01	2010-11	Absolute Change	Relative Change %
Rice	2337.4	6159.0	3821.6	163.5
Jwar	5.9	8.5	2.6	44.6
Maize	125.7	185.8	60.1	47.8
Kodo-Kutki	31.9	26.5	-5.4	-16.8
Other Cereals	9.8	9.5	-0.3	-3.1
Total Cereals	2510.6	6389.3	3878.7	154.5
Arhar	21.2	23.9	2.7	12.8
Moong	2.4	2.7	0.3	11.3
Urd	32.9	29.6	-3.3	-10.0
Kulthi	18.3	14.0	-4.3	-23.4
Other Pulses	0.0	0.0	0.0	0.0
Total Pulses	74.7	70.1	-4.6	-6.1
Groundnut	32.0	37.4	5.4	16.8
Til	4.0	6.9	2.9	73.9
Soybean	6.9	12.0	5.1	73.4
Niger	13.2	112.4	99.3	754.8
Sunflower & Others	0.0	0.2	0.2	500.0
Total Oilseeds	56.0	168.8	112.8	201.3
Total Kharif	2641.3	6628.2	3986.9	150.9
Wheat	79.5	121.8	42.3	53.2
Summer Paddy	34.2	506.9	472.8	1384.0
Barley & Other	0.0	2.1	2.1	00.0
Total Cereals	113.7	630.7	517.1	455.0
Gram	72.1	239.6	167.5	232.2
Pea	3.2	4.8	1.6	49.5
Masoor	3.4	5.0	1.6	47.1
Moong	0.9	1.6	0.7	71.3
Urd	1.3	1.1	-0.1	-11.2
Kulthi	0.9	0.6	-0.3	-37.1
Tiwra	108.9	223.6	114.8	105.4
Other Pulses	0.0	0.4	0.4	00.0
Total Pulses	190.7	476.8	286.1	150.0
Mustard	26.6	20.8	-5.8	-21.8
linseed	23.4	9.8	-13.6	-58.2
Safflower	0.3	0.2	-0.1	-17.2
Sunflower	1.1	1.3	0.2	21.8
Sesamum	0.0	0.1	0.1	00.0
Groundnut	0.0	8.9	8.9	00.0
Other Oilseed	0.0	0.0	0.0	00.0
Total Oilseed	51.4	41.2	-10.2	-19.9
Total Rabi	355.7	1148.7	793.0	222.9
Grand total	2997.1	7776.9	4779.9	159.5
Total Cereals	2624.3	7020.0	4395.8	167.5
Total Pulses	265.4	546.9	281.5	106.1
Total oilseeds	107.4	210.0	102.6	95.5

Source : Directorate of Agriculture, C.G. Raipur

Table 5.3: Productivity of Crops in Chhattisgarh State.**(Kg/ha.)**

Crops	2000-01	2010-11	Absolute Change	Relative Change %
Kharif				
Rice	629.0	1751.0	1122.0	178.4
Jwar	665.0	1443.0	778.0	117.0
Maize	1346.0	1809.0	463.0	34.4
Kodo-Kutki	134.0	207.0	73.0	54.5
Other Cereals	276.0	143.0	-133.0	-48.2
Arhar	429.0	439.0	10.0	2.3
Moong	268.0	290.0	22.0	8.2
Urd	281.0	289.0	8.0	2.8
Kulthi	296.0	287.0	-9.0	-3.0
Other Pulses	0.0	0.0	0.0	0.0
Groundnut	935.0	1263.0	328.0	35.1
Til	169.0	340.0	171.0	101.2
Soybean	547.0	173.0	-374.0	-68.4
Niger	177.0	1174.0	997.0	563.3
Sunflower & Others	415.0	889.0	474.0	114.2
Rabi				
Wheat	1021.0	1174.0	153.0	15.0
Summer Paddy	663.0	1751.0	1088.0	164.1
Barley & Other	0.0	735.0	735.0	0.0
Gram	515.0	945.0	430.0	83.5
Pea	362.0	339.0	-23.0	-6.4
Masoor	271.0	312.0	41.0	15.1
Moong	192.0	226.0	34.0	17.7
Urd	240.0	258.0	18.0	7.5
Kulthi	254.0	265.0	11.0	4.3
Tiwra	434.0	623.0	189.0	43.5
Other Pulses	0.0	170.0	170.0	0.0
Mustard	552.0	414.0	-138.0	-25.0
Linseed	259.0	260.0	1.0	0.4
Safflower	302.0	300.0	-2.0	-0.7
Sunflower	1056.0	332.0	-724.0	-68.6
Sesamum	0.0	398.0	398.0	0.0
Groundnut	0.0	1339.0	1339.0	0.0
Other Oilseed	0.0	0.0	0.0	0.0

Source : Directorate of Agriculture, C.G. Raipur

5.4 Horticulture

The production of all the horticulture crops were recorded 6155663 ton in the year 2010-11. Amongst all the horticultural crops the maximum production was found in vegetables

Table 5.4: Area and Production of Horticultural Crops in Chhattisgarh State.

Source : Chhattisgarh at a glance 2011.

A. Agriculture Research

★ Directorate of Extension
○ KVK

Fig. 11: Krishi Vigyan Kendra in Chhattisgarh.

The activities of research also carried out by National Seed Project (field crops and vegetable crops) Dry Land Agriculture Project, All India Coordinated Maize Improvement Project (AICMIP- Small Millets), wheat improvement project, water management project, farming system research (FSR), utilization of animal energy, post harvest technology and ground water utilization Projects.

The university also have 5 All India Network Projects under National Agriculture Innovation Project and located at Raipur (3) and Jagdalpur (2). There are twenty Rastriya Krishi Vikash Yojna Projects in operation to carried research activities on various aspects at Raipur (14), Bilaspur (2) Ambikapur (1) and Jagdalpur (3). The 9 Ad-hoc Projects (NAIP and RKVY) Projects also in working at Raipur (5), Jagdalpur (1) and Kawardha Districts (3) on various aspects of Agriculture Research activities.

The social studies have also been carried out by Agro- Economic Research Centre situated at Jabalpur. To monitor the activities of KVK the state carried through a Zonal Project Directorate Zone VII at Jabalpur district. These are also three international projects is in operation viz. Enhancing chickpea production in rainfed rice fallow lands (RRFL), pulse production and protection technology (PPPT-Raipur), Stress Tolerance Rice for Africa and South Asia (STRASA), Grasspea production for safe human food, animal feed and sustainable rice based cropping system in India.

B. Agriculture Education

In Chhattisgarh State the agricultural education has been carried out by mainly through IGKV, Raipur. The university has twelve college under its constitute i.e. Raipur, Bilaspur, Ambikapur, Jagdalpur, Janjgir-Champa, Kawardha, Bhatapara, Rajnandgaon, Raigarh, Korea, Bemetara and Kanker districts. Agriculture education also provided by the nine affiliated colleges of the university located at Durg, Ambikapur, Dhamtari, Kawardha, Rajnandgaon, Raigarh, Dantewada, Ambikapur-Chwoki and Bhilai-Durg Districts. The university was also two Agricultural Engineering Colleges at Raipur and Mugeli and two affiliated Agricultural Engineering Colleges at Durg and Bhilai-Durg. The university provides education to students at graduation, post graduation and Ph.D. level for all the major courses of agriculture. Now a days facility of Horticulture education also provided in the state. The university has six Horticultural

Colleges, in which two colleges are constitute of 19 at Jagdalpur and Rajnandgaon, while four affiliated Horticulture College are located at Raipur. Dhamtari (2) and Pendra Road (Bilaspur).

C. Extension

The Agricultural extension activities have been carried out through 20 Krishi Vigyan Kendras in the state. These centre are located at Kawardha, Korea, Jashpur, Kanker, Rajanandangaon, Korba, Dantewada, Raipur, Janjgir-Champa, Raigarh, Dhamtari, Mahasamund, Surguja, Durg, Bastar, Bilaspur, Surguja, Kerlapal, Narayanpur, Gariyab districts and Raipur block of Bijapur Districts (Fig. 11). The extension activities are also carried out through State Agricultural Implement Testing Centre also Agriculture Technology Information Centre (ATIC). Kisan Call Centre (KCC). The State Government of Chhattisgarh has also a vast network for providing crops and farm technologies to the farmers at village level from Directorate of Agriculture, Raipur. The extension activities are carried at Districts, Divisions, Blocks and at Village levels from various field officers of the state government (Box-I).

Agricultural set up of present Agricultural Extension system / Administration in Chhattisgarh

Administration posted on three levels		
1 Top level -	DA-	Director of Agriculture
	ZAEO-	Zonal Agriculture Extension Officer
	DDA-	Deputy Director of Agriculture
	SDAO-	Sub-Division Agriculture Officer
2 Middle level-	SADO-	Seniors Agriculture Development Officer
	ADO-	Agriculture Development Officer
3 Bottom level	RAEO-	Rural Agriculture Extension Officer
	CA-	Contact Farmers

7. ANIMAL HUSBANDRY, DAIRYING, FISHERIES AND GROWTH

The total population of livestock was found to be increased 12.3 % in 144.16 lakh (2011) over the year 2001(128.39 lakh). The population of cow-oxen (14.4%), goats (1243.7%), poultry (136.41%) have been found to be increased, while the population of buffaloes (-13%), sheep (-32%), pigs (-46%) and others (-99.9%) found to be decreased in the year 2010-11 as compare to 2000-01. The Chhattisgarh state exported 8.25 % to total fish production of India. The

Chhattisgarh state produced 228207 MT (2010-11) fish seed production with 29565 lakh spawn. There were 127 kg/ha irrigated reservoir. The production of milk (29.47%), meat (637.57%) and eggs (61.56%) are found to be increased in 2011 as compare to 2001. (Table 7.1)

Table 7.1: Number of Livestock in Chhattisgarh State. (lakh)

Categories	2001	2011	Absolute Change	Relative Change %
A. Livestock				
Total Live Stock	128.39	144.16	15.8	12.3
Cows-Oxen	82.92	94.9	12.0	14.4
Buffaloes	18.43	16.04	-2.4	-13.0
Sheep	2.06	1.4	-0.7	-32.0
Goats/ Ponies	2.06	27.68	25.6	1243.7
Pigs	4.33	4.13	-0.2	-4.6
Other	18.59	0.01	-18.6	-99.9
Poultry	60.25	142.45	82.2	136.4
B. Production				
Milk (000MT's)	795	1029.31	234.31	29.47
Wool (000; kg)	NA	114.07	----	-----
Meat (000; kg)	3691	27223.57	23532.57	637.57
Egg (Lakh No's.)	7704	12446.45	4742.45	61.56
C. Fisheries (2011)				
Fish Production (Ton)				228207
Fish Seed Production (Lakh spawn)				29565
Fish Productivity- Rural Ponds (Kg/Hect.)				2650
Irrigation Reservoirs				127
Imports (MT's)				16690
Exports (MT's)				18830 (8.25%)

Source : Chhattisgarh at a glance 2011

8. POST HARVEST MANAGEMENT AND VALUE ADDITION

The food processing sector of Chhattisgarh covers fruits and vegetables, meat and poultry, milk and milk products, alcoholic beverages, fisheries, plantation, grain processing and other consumer product groups like confectionery, chocolates and cocoa products, soya- based products, mineral water, high protein foods etc. After harvest, foods (e.g. fruits, vegetables, milk, meat, fish,) are liable to accelerated physiological, chemical, and microbial processes that invariably lead to deterioration and loss of wholesomeness. It is then necessary to institute some measure of processing such as reduction in moisture content, denaturation of endogenous enzymes and micro-organisms, or packaging in order to curtail perishability.

Value addition to food products has assumed vital importance in our country due to diversity in socio-economic conditions, industrial growth, urbanization and globalization. It is

not merely to satisfy producers and processors by way of higher monetary return but also with better taste and nutrition. Value is added by changing their form, colour and other such methods to increase the shelf life of perishables.

Though, with the effort of Ministry of Food Processing Industry the growth of this sector is accelerated, however, there is need to discuss and sort out various related issues amongst people of various categories to increase level of value addition and improve the quality of value added food products for domestic market as well as export. Strong demand for value addition has abundant raw material for processing, there is huge demand for basic value added services such as grading, cleaning and washing. Currently there is negligible supply of these services in the state. This leaves ample opportunities for new investors to set up processing plants in the state focused on value addition. The state government has provided facilities for grading and processing of horticulture products and has set up 25 production units for value added services such as grading, processing, waxing, extraction and distillation.

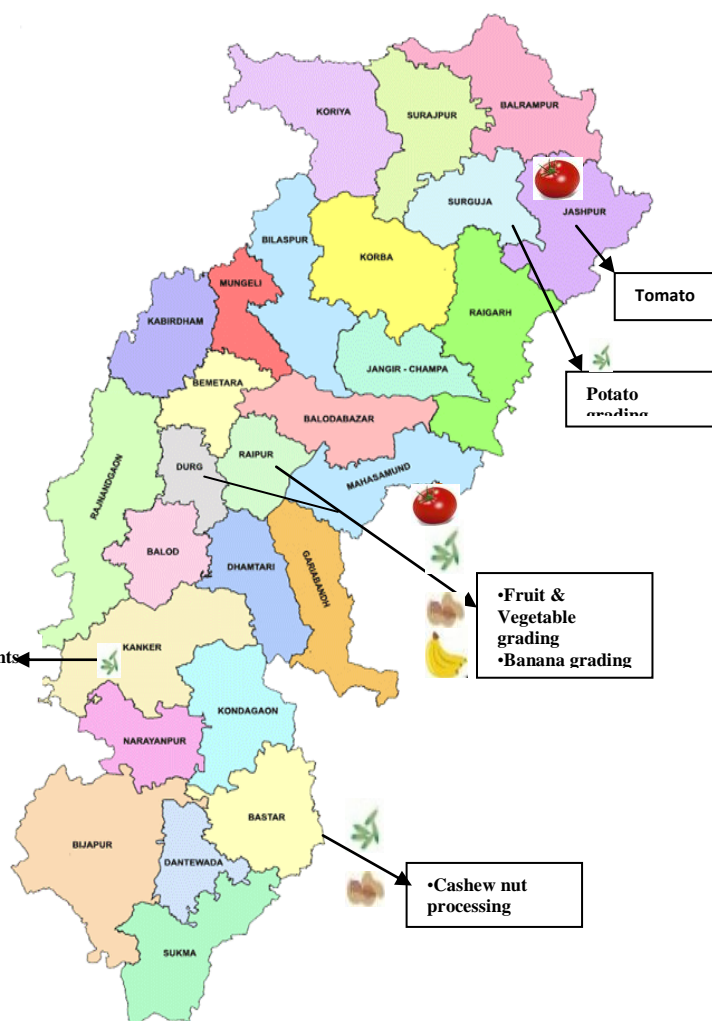


Fig. 12: Processing, Grading and Cleaning unite in Chhattisgarh.

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