

Chapter-I

Introduction

Performance of agriculture sector in the country has turned out to be quite dissatisfactory because of sharp deceleration in growth rate of agricultural output. Ministry of Finance, Planning Commission, and office of Prime Minister are emphasizing concerted measures to address poor growth rate in agriculture, partly because poor growth rate has serious implications on the food availability for the ever-growing population and partly because it affects growth of overall economy of our country. The 53rd National Development Council resolved that agricultural strategies must be reoriented to meet the needs of farmers and called upon the Centre and States to evolve a strategy to rejuvenate agriculture. The NDC reaffirmed its commitment to achieve growth 4% annual growth in the agriculture sector during the 12th Five-Year Plan.

As per the resolution, States have to formulate District Agriculture Plan for each district that fully utilizes resources available from all existing schemes, State or Central, including resources at the district level. The District Agriculture Plan includes livestock and fishing and is integrated with minor irrigation projects, rural development works and with other schemes for water harvesting and conservation.

Chandrapur district has good potential for agricultural development keeping in view the adequacy of water resources mainly groundwater, rivers, reservoirs and perennial village's ponds. The recent policy initiatives of Government of India and state Government can help in tapping the potential for credit in the district National Horticulture Mission, crop diversification, cluster development for tassarsilk, bamboo, dairy, fisheries and outlay under BRGF, upscaling of SHG financing, phased completion of 10 minor projects. Appropriate revision of scales of finance Interest subsidy on crop loans, linking of spices production. like chilly, turmeric and basmati rice with contract farming, development of tassarsilk, bamboo, fisheries.

The District Agriculture Plan is, therefore, developed by combined efforts of departments of agriculture, animal husbandry, fisheries, dairy development, sericulture and expert from State Agriculture University. The present scenario of

the district is studied and growth rate of agriculture is found out. The reasons for low productivity are studied and gaps in adoption of technology by the farmers are analyzed. In order to achieve higher production targets during the period of 12th Five-Year plan, the projections of production of crops, milk, eggs, meat and fish are made. Accordingly, the strategies and activity plan are prepared to achieve the projected targets.

MAHARASHTRA RESOLUTION

A joint review of the agriculture sector of Maharashtra on 31 August, 2007 at Mumbai by the Hon'ble Prime Minister, Hon'ble Agriculture Minister, Hon'ble Chief Minister of Maharashtra, Deputy Chairman and Member, Planning Commission identified the key thrust areas for the rejuvenation of the sector in the State to achieve the objectives set forth in National Development Council Resolution of the 29th May 2007. While reaffirming the commitment of the State to achieve 4.4 percent annual growth in agriculture sector in the State during the XII Five Years Plan period, the following was resolved.

1. Achieve additional production of 39.80 lakh MT of cereals (22.63 lakh MT of rice; 16.53 lakh MT of wheat); 7.74 lakh MT of pulses; and 12.24 lakh MT of oil seeds in the State under the National Food Security Mission.
2. Ensure expenditure above the baseline expenditure in agriculture and allied sectors and prepare District Agriculture Plans; aggregate them into a State Agriculture plan in the next three months; and also formulate schemes/ projects/ programmes along with the detailed Project Reports for agriculture and allied sectors to avail of Additional Central Assistance under the new scheme of ACA.
3. Efforts would be made to utilize the resources available from all existing schemes such as Backward Region Grant Funds, National Rural Employment Guarantee Programme, and include livestock and fishing and be integrated with minor irrigation projects, rural development works and with the other schemes for water harvesting and conservation. Efforts would also be made to include schemes for beneficiaries of land reforms.

4. Agriculture in Maharashtra primarily being grain-fed, watershed development will be the major strategy for increasing the agriculture production and productivity. This will include watershed treatment on 50 lakh hectares and various measures for protective irrigation and water recharging including 3 lakh farm ponds; repair of 6500 bodies and treatment in 1 lakh hectares in ill-drains saline soil of Purna basin.
5. Harness the potential of horticulture produce for export of grapes; pomegranate, etc. through cold chain facility and post harvest infrastructure and creation of similar facilities in the State with the assistance from National Horticulture Mission. Create infrastructure for better water availability and promote water use efficiency by accelerated implementation of Micro Irrigation scheme.
6. Initiate action to set up modern terminal market complexes for perishable agricultural produce near Mumbai, Nasik and Nagpur to achieve financial closure for these markets by March, 2013.
7. The State to give wide publicity to the provisions of the Central Sector Scheme of "Development/ Strengthening of Agricultural Marketing Infrastructure" to encourage State agencies to avail assistance under the Scheme for modernizing the infrastructure in APMC yards and to motivate private sector for making investment in setting up marketing/ value addition facilities.
8. Project proposal for World Bank, funding under proposed Multi-State Agricultural Competitiveness Project (MACP) may be finalized by October, 2012 as suggested by the World Bank and submitted to the Ministry for taking it up for appraisal.
9. Strengthen agriculture extension in the State by expediting implementation of the ATMA programme with focus on demonstration, training and involvement of farmers groups; strengthen technical expertise at district and taluka levels; improve research-extension-farmer linkages through the State Agriculture Universities and the KVK's; promote public-partnership in

extension, complete implementation of AGRISNET project by March, 2013 and enhance use of ICT in extension.

10. Maharashtra needs to take immediate steps for carrying out necessary legal reforms by amending the State Co-operative Societies Act for implementation of the Vaidyanathan committee report and also to expedite the process of special audit for availing and provide credit to additional 38 lakh farmers.
11. Accord the highest priority to seed production and make special efforts to bridge the gap between seed requirement and seed production/availability in the State. Further, particular focus will be on paddy, ragi, barley seeds and pulses like arhar, urad, moong, lentil, kulthi, khesari, cowpea, moth peas and gram and oil seeds like groundnut, sunflower and safflower.
12. The State would publicise at its level encouragement to private sector seed companies to avail benefits under the Central Sector Scheme of "Assistance for boosting of seed production in private sector" with the assistance from National Seeds Corporation.
13. Establish more seed testing laboratories besides the existing 8 seed testing laboratories in different regions of the State and a DNA finger printing laboratory in view of increasing area under Bt cotton in the State.
14. Take up expansion of soil testing capacity in each district and facilitate to test input quality; there is 118 soil testing laboratories and 5 fertilizer testing laboratory for soil, 3 seed testing laboratories, fertilizer and bio-fertilizer testing in the XII plan period.
15. Take effective steps through a campaign mode, against the menace to spurious pesticides.
16. Initiate steps under the State organic Farming policy to promote use of bio-fertilizers organic manure and micro-nutrient to enhance soil health; to provide further, boost to creation of organic sites in all talukas of the State in association with NGOs/co-operatives and others.

17. Expedite the completion of ongoing irrigation project and bring additional areas of 15 lakh hectares under irrigation.
18. Endeavor to achieve milk production of 120 lakh metric tonnes, meat production of 4.50 lakh metric tonnes, egg production of 532 crore in land and marine fish production of 2.25 lakh metric tonnes and 6.50 lakh metric tonnes respectively in the livestock and the fisheries sector by the end of the XII plan period through substantial investments in better healthcare for animals, creation of better market facilities, increased production of fodder and more improved and scientific practices for fish production and also more investment in education research and laboratory facilities in the related fields.

An operational Work plan to implement the above would be formulated by the State as soon as possible.

53rd National Development Council Resolution

The National Development Council resolves that agricultural development strategies must be oriented to meet the needs of the farmers and calls upon the Central and the States to evolve a strategy to rejuvenate agriculture. The NDC reaffirms its commitment to achieve 4 percent annual growth in the agricultural sector during the 12th plan and, towards this end, resolves that the following steps will be taken by the Central and States:

Action to be taken by the Central Government

1. Launch a Food Security Mission covering wheat, rice and pulses as a central scheme aimed at producing over the next four years an additional 18 million tonnes of wheat, 25 million tonnes of rice and 10 million tonnes of pulses over the base year (triennium ending 2011-12)
2. Introduce a new Additional Central Assistance scheme to incentivise States to draw up plans for their agriculture sector more comprehensively, taking agro-climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries more fully. This will involve a new scheme for Additional Central Assistance

(ACA) to State Plans, administered by the Union Ministry of Agriculture over and above its existing Centrally Sponsored Schemes, to supplement the State-specific strategies including special schemes for beneficiaries of land reforms. The newly created National Rainfed Area Authority will on request assist States in planning for rainfed areas.

3. Provide additional resources for irrigation via ALBP, including a component on modernization, linked to adoption of improved participatory irrigation management and command area development. Schemes involving rivers within a state could also be considered for AIBP.
4. Give the national agriculture research effort a strategic focus by providing additional resources for the Nation Strategic Research Fund under the Ministry of Agriculture with a governance and implementation structure appropriate to fund University, CSIR laboratories and private institutions besides ICAR. Additional funding will also be providing to support regionally focused research projects in State Agricultural Universities.
5. Restructure the pattern of RIDF funding by NABARD and replace the present pattern of year by year fund allocation by State-wise indicative allocations for the entire 12th Plan period, which will keep in mind the needs of States with low rural credit-deposit ratios. Activities eligible for Funding will be reviewed in the light of the needs identified in State Agriculture Plans for potential growth areas like horticulture, livestock, poultry and fishery including infrastructure for these areas.
6. Initiate steps to restructure the fertilizer subsidy programme and its delivery to the farmer, and move to a system that provides balanced plant nutrition without adverse effects on soils. The use of biofertilizers, organic manure and micro-nutrients to enhance soil health will be promoted.
7. Take new initiatives to improve skill development in the farming community, including training of farmers in modern methods of agriculture as well as imparting skills relevant for non-agricultural activity.

Action to be taken by State

1. Formulate District plan for each District that fully utilizes resources available from all existing schemes, State or Central, including resources at the district level from schemes such as BRGF and NREG. The District agricultural plan will include livestock and fishing and be integrated with minor irrigation projects, rural development works and with other schemes for water harvesting and conservation. Each State will setup appropriate unit(s) at District level for this purpose.
2. Prepare a State Agriculture plan based on district plans aimed at achieving the State's agricultural growth objective, keeping in view the sustainable management of natural resources and technological possibilities in each agro-climatic region. Each State will ensure that the baseline share of agriculture in its total State Plan expenditure is at least maintained, and upon its doing so, it will be able to access the new ACA to meet the Central contribution to the expenditure on the agricultural plan beyond the baseline.
3. Make special efforts to complete all projects taken up under AIBP without time and cost overrun and prioritize irrigation projects in consonance with their agriculture production targets. States will make special efforts to ensure better water management and enhance water use efficiency.
4. Accord the highest priority to seed production so that an adequate supply of quality seeds of relevant major crops and fodder is available at reasonable prices and at the right time. This is necessary to improve seed replacement rates which help reduce yield gaps. There should be close liaison between State and State agricultural universities or ICAR institutions for ensuring production of seeds of varieties suitable for each agro-climatic region. Public sector for varieties development can be considered.
5. Undertake a major expansion and revamping of State agricultural extension systems. This will involve the State Agricultural Universities and Krishi Vigyan Kendras; and

includes support animal resources development, expansion of soil testing capacity in each district and facilities to test input quality. The public-private partnership (PPP) mode should be used wherever possible.

6. Expedite signing of the MoU (if not done so far) for early implementation of the Vaidyanathan committee recommendations and set monitorable deadlines for meeting the commitments so that the cooperative credit structure can be revamped.
7. Encourage development of modern markets by completing the process of amending the APMC Act and notify the rules there under, and also encourage development of linkage to markets through a variety of instruments including co-operatives of farmers, contract farming and other means preferred by the States.

Concrete proposals to implement these will be spelt out in detail as quickly as possible both by the Central and by the States.

METHODOLOGY AND PROCESS

Introduction:

District Agriculture Planning Unit (DAPU) included district level officers of agriculture and line departments and scientist from Krishi Vigyan Kendra, Sindewahi, Chandrapur. Scientist of Krishi Vigyan Kendra focused on latest potential for district development and identified initiatives required for preparation of comprehensive district agriculture plan (C-DAP).

Collection of data from all the sectors of Agriculture and compilation:

Collection of data was done by district level officers of agriculture and line departments and scientist from Krishi Vigyan Kendra, Sindewahi, Chandrapur. The data collected was checked & verified with other sources.

Formation of Agriculture Planning Unit:

As per Maharashtra Government resolution No. RVP- 1007/PK106/Z-A: dated 27th August 2007 following committee was constituted as given below.

District Agriculture Planning Unit (DAPU):-

District Collector : - Chairman
Chief Executive Officer : - Deputy Chairman
District Deputy Commissioner : - Member.
District Dairy Development Officer : - Member.
District Fisheries Development Officer : - Member.
Assistant Manager, NABARD : - Member.
Programme Coordinator, KVK, Gondia : - Member.
Agriculture Development Officer, Zilla Parishad: - Member
District Superintending Agriculture Officer : - Member Secretary

3) Formulation of District Agriculture Plan:-

Performance of agriculture sector in the country has turned out to be quite dissatisfactory because of sharp decline in the growth of agriculture output, Ministry of finance and planning commission are emphasizing concerted measures to address poor growth rate in agriculture partly because poor growth rate has serious implication on the food availability for the ever growing population and partly because it affects growth of overall economy of country. The NDC reaffirmed its commitment to achieve 4% annual growth in the agriculture sector during the 12th five year plan. As per resolution, DAPU formulated District Agriculture plan for Chandrapur district that fully utilizes resources available from all existing schemes, state or central, including resources at the district level and also proposed new schemes.

Agriculture is usually the largest commodity producing sector of Chandrapur district economy. The district Agriculture plan includes lives stock and fishing and

integrated with minor irrigation projects, rural development works and with other schemes for water harvesting and conservation.

Animal husbandry and Dairy is closely interwoven with agriculture and plays an important complementary role in the rural economy. It provides high quality food (milk, meat and eggs), wool, and in addition to providing employment or supplementary income to rural population and good quality manure. The Agriculture sector in Chandrapur district includes all agricultural crops like cereal, pulses and horticulture output which include vegetables, fruits, flower, fisheries, forestry and social forestry.

Animals are generally fed together, farmers generally do not keep separate account of the output of agriculture crop and the part goes as inputs for feeding the animals. The estimate of inputs cannot be prepared separately. Thus, the directorate of Economics and statistics prepared the value added estimates for the overall activity of agriculture, animal husbandry and fisheries separately by using the following formula. $Value\ Added = (Value\ of\ output - Value\ of\ Input)$

1) Value of output of particular crop = Price × output produced or procured

Whichever is relevant.

For estimating the value of output from the agricultural sector, there are three major categories:

- a) Agriculture outputs sold in the open market.
- b) Agriculture output procured and retained by farmers.
- c) Agriculture byproduct.

Relevant Variables for prices:

- a) Postharvest prices of each variety of crops.
- b) Respective quantity produced.
- c) Procurement of price of each crop.

d) Amount procured for each crop.

e) Price procured for each crop.

f) Amount of by-product produced per ton of the relevant crops.

2) Value of output in Animal Husbandry Sector:

Value of Output = Total sum of the value of each animal husbandry product from each category of animal.

$$\sum_o \sum_A VOA = \sum_o \sum_A POA \times ROA \times NOA$$

VOA: Value of Output of animal A
POA: Value of product of animal A

ROA: Yield rate of output of animal A

NOA: Population size of animal that produce O

3) Value of Input:

To arrive at the district-wise gross value added (GVA) from Agriculture (Crop husbandry) and Animal Husbandry sector, value of various input items has to be first deducted from the gross value of output of these sectors. The deductible inputs are a) seed, b) organic manure (Cattle and Buffalo dung), c) chemical fertilizers, d) feed of livestock, e) pesticides and insecticides, f) diesel oil consumption, g) electricity, h) irrigation charges, i) market charges, j) repairs and maintenance of fixed assets and other operational costs and k) financial intermediary services indirectly measured.

The Gross Value Added of Agriculture (Crop husbandry), Animal Husbandry and fisheries sectors was individually calculated and used for estimate of share of Agriculture, Animal Husbandry and Fisheries sectors in Gross Domestic Product of Nagpur District. The year-wise estimated figures of separate and combined share of Agriculture (Crop husbandry), Animal Husbandry and fisheries sector are given in Table 1.2.

4) Growth Rate calculated by

$$\frac{(\text{Current year value}) - (\text{Previous year value})}{\text{Previous year value}} \times 100$$

(Previous Year Value)

Growth rate is a relative concept. Even if absolute value increase is the same amount of the percentage increase in growth rate will be different. It will be lower for higher base values.

GDP of Maharashtra State in the year 2005-2006 was Rs. 339425 Crore at constant prices of 1999-2000. The share of Agriculture sector of Chandrapur district in its Gross Domestic Product was highest in the year 2003-04 while it was lowest in the year 1999-2000. The contribution of agriculture in GDP of the district is declining and therefore, the annual growth rate of agriculture is also declining.

Table 1.2: Share of Chandrapur district in the GVA yearwise

Year	GVA of M.S. (Rs In Lakh)	GVA of Chandrapur (Rs in Lakh)	Share of Chandrapur district (%) in the Agriculture Sector of Maharashtra State
2005-2006	2759313	49618	1.80
2006-2007	2564676	35675	1.39
2007-2008	2787968	51277	1.84
2008-2009	2822095	40371	1.43
2009-2010	3028581	45892	1.51
2010-2011	2806940	29883	1.06
2011-2012	3129929	31405	1.00

The year-wise estimated figure of separate and combined share of Agriculture

(crop husbandry), Animal Husbandry and Fisheries sector are given in Table 1.3

Table 1.3: Share of Chandrapur district in the GVA of Agriculture and allied sector in State

District	Fishery	AnimalHus. andDairy	Agriculture	Total
Wardha	750.14	2556.85	57602.71	60909.70
Nagpur	2258.57	4356.57	107327.00	113942.100
Chandrapur	4282.28	3244.57	34643.85	42170.7
Gondia	5476.71	4978.14	14786.14	25240.99
Bhandara	3828.85	4908.42	41729.00	50466.27
Gadchiroli	840.42	3900.85	14570.42	19311.69
Nag.Div.	17236.71	24500	269094.14	310830.90
M.S.	93341.42	355665.28	2862786	3311793.00

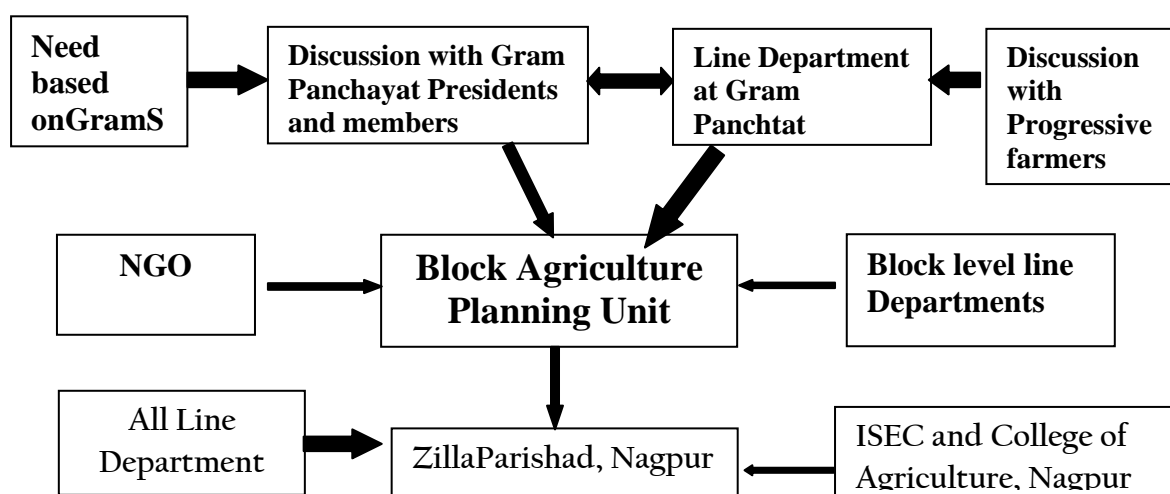
PreparationofDistrictAgriculturePlan:

1.1 Organization of Report

This report deals with process of preparation of C-DAP and provides sequentially the steps to be taken in the process and methodology to be adopted by making several meetings and discussion of district level officers and. Manual begins with the vision for the district and elaborates on methodology in collection and analysis of the data. The focus of the methodology and process is to arrive at optimum utilization of resources and convergence of the existing and new schemes. The manual emphasizes preparation of innovative schemes keeping in view the developmental needs of the district and the available resources. It also provides suggestive/indicative data formats to be utilized.

Thus, the utmost care has been taken to prepare C-DAP with the involvement of stakeholders at all levels.

Flow Chart of Consultation Process



ISEC: Institute for Social and Economic Change

NGO: Non Government Organisation

G.P: Gram Panchayat

Data collected and compiled by the Extension Functionary and the data submitted by district heads of line department consolidated. Present status of the entire Agriculture and line department was discussed and projections for development of individual sector during the 12th Five-year plan were formulated.

Chapter-II

General Description of the District

2.1 Introduction

Chandrapur was formerly known as Chanda and is situated in eastern Maharashtra state, Central India. Wardha River flows near the city. Chandrapur was the capital of the Gond dynasty from the 12th to the 18th century and was later conquered by the Maratha Bhosles from Nagpur. It formed part of the British Central Provinces from 1854 until Indian independence in 1947. The tombs of the Gond kings and several temples are in the town.

The district Chandrapur was earlier known as 'Chanda' according to tradition and legend the name of the place was 'Lokapura' which was first changed to 'Indpur' and subsequently to Chandrapur. During the British colonial period it was called Chanda district, which was again changed to its original name 'Chandrapur' around 1964. Other places of the region in ancient times include Wairangad, Kosala, Bhadravati and Markanda.

2.2.1 Location and Geographical Unit

Chandrapur district is located in the eastern edge of Maharashtra in Nagpur division and forms the eastern part of 'Vidharbha' region. It is located between 19.30' N to 20.45' N Latitude and 78.46' E longitude. It is the easternmost district of the state of Maharashtra. The district is bounded by Nagpur, Chandrapur and Wardha on the northern side. Yavatmal on the western side. Gadchiroli on the eastern side and Adilabad district of the Andhra Pradesh on the southern side. Physiographically, the district is situated in the Wainganga and Wardha river basin.

slopes of the hills have poor and low density vegetation. The plains of the tract have luxuriant forest. The district had about 3651 sq.km. forest cover in 1998-99, which accounted for 33.44% of the total geographical area of the district. However according to forest Dept. the district has an area 3600.6 sq.km under forest which works out to 31.50% against total geographical area of District.

Map showing Talukas distributed in Chandrapur district



2.2.2 Demographic Profile

Demography of a district such as population and its growth, density, occupational structure, sex ratio etc. The total geographical area of the district Chandrapur is 11443 sq km of which 11280 sq km is rural and 162.2 sq km is urban. The average no of inhabited villages per tehsil comes to about 105. According to the latest Census 2001, the total population of Chandrapur district was 20,71,101 persons of which 14,06,034 persons (67.89 %) were residing in rural areas and 6,65,067 persons (32.11%) were in urban areas. In 1991 Chandrapur had 2.24% of state population over 3.72% of its area and in 2001 it came down to 2.14%. Sex ratio of the district is 948 females per 1000 male

Blockwise Distribution of population (urban & rural)

SN	Taluka	Area	Population				
			Total	Male	Female	Rural	Urban
1	Chandrapur	1343.8	481758	247558	234200	79936	401822
2	Bhadravati	1200	158751	82121	76630	84309	74442
3	Warora	1081.2	171540	87540	84000	125008	46532
4	Chimur	1025.0	169547	85898	83649	169547	0
5	Nagbhir	793.7	133020	66886	66134	133020	0
6	Bramhpuri	868.7	166165	83680	82485	130140	36025
7	Sindhewahi	1053.0	110440	55784	54656	110440	0
8	Mul	818.7	114611	57358	57253	89162	25449
9	Saoli	146.7	107937	54291	53646	107937	0
10	Gondpipri	1018.7	79672	40315	39357	71198	8474
11	Rajura	1700	138408	71136	67272	99475	38933
12	Korpana	NA	125317	64675	60642	84302	41015
13	Pomburna	NA	50781	25648	25133	50781	0
14	Ballarpur	392.7	134540	69461	65079	31854	102686
Total		11442.2	2204307	1123834	1080473	1428929	775378
Source: Census of India 2011							

ScheduleCaste proportion(%)

Persons	Male	Female
15.81	8.03	7.78

scheduleTribeproportion(%)

Persons	Male	Female
17.70	8.92	8.78

Table 2.1 demographic features in Chandrapur District

According to the 2001 census, the demographic features observed in Chandrapur district areas follows:

Total Population	2071101
Total Male Population	1062993
Total Female Population	1008108
Sex Ratio	950
Urban Population	665067
Rural Population	1406034
Percentage of Urban	32.11%
Population Density	160 persq.kms.
Literacy Rate	62.32%
Male Literacy Rate	8.42%
Female Literacy Rate	41.18%
SC percentage	14.3
ST percentage	18.10
Slum Population percentage	5.79%
Population below poverty line	13.30%

2.2.2 Economic, Occupational, Social and Educational Profile of the Population

Physical feature and land use pattern of the district indicate that agriculture is the main activity in the district. The total cropped area is 5208.77 Sq. kms. i.e. 45.52% of the total area of the district.

Out of the total area, 20039.4 hectares area is non agriculture, 35886.3 hectares area is uncultivable land and 477102 hectares area is net cultivable area.

Paddy, Cotton, Jowar and Soybean are the main crops in the district. 31.50% of the total area is under forest cover.

The percentage of urban & rural population is 64.82% & 35.18% respectively. Scheduled Castes and Scheduled Tribes population accounts for 15.81% and 17.70% respectively. The total area under industrial use accounts for 32.34 sq. km.

There are 8 Urban centres and 13 major rural centres. 6.71% of the population lives in the slums and 8.00% of the population is below poverty line.

Total work-force in 4 existing industrial estates is just 2071 but there are major industrial like coal mines, Thermal power station, Cement factories, Paper mill etc. which are situated outside the industrial area where work force is about

30,000. There is influx of workers from other states particularly in Coal Mines. Seasonal migration is temporary phenomenon lasting for two-three months. The workers mostly come from Madhya Pradesh, Andhra Pradesh, Orissa and Bihar.

There are two historical centres and 16 religious centres where there is influx of tourists in particular season.

The overall literacy percentage of the district is 80.00%

2.2.3 Topography & Agroclimatic Characteristics

Owing to the geographical location and physical features, the climate of the district can be classified as tropical hot climate with high range of temperature throughout of year. Primarily there are two prominent seasons in the district - the very hot summer and moderate winter. The summer months are very hot and prolonged while winter is short and mild. The monsoon season starts immediately after summer till late September. The southwest monsoon brings lot of rain fall during rainy season and there is no draught prone area in the district.

The temperature starts decreasing from the month of October. December is the coldest month. Mean maximum temperature during December is 28.2° and mean minimum is 11.6° . The southern part is comparatively warmer than the north, which ranges between 29.6° to 14.6° . The lowest recorded temperature is 3° in the north and 8° in the south. The daily mean temperature starts rising from the month of February and may is the peak summer month when mean maximum temperature goes up to 43° and minimum temperature is 28° to 29° . In severe heat condition temperature rises up to 46° . However temperature starts reducing after May due to onset of monsoon, which lasts from June to September when it is hot and humid.

The average annual rainfall is about 1420 mm. The eastern part receives more rainfall than the west. Average number of rainy days is 60 to 65 throughout the district.

The relative humidity is very high during monsoon season, which exceeds 70%, but after monsoon season it falls down rapidly and in summer it is only 20%.

The prominent wind direction is from south to north. In summer the wind direction is from east to south and monsoon from south to east. During winter, the wind direction changes from north to east. Frequently is characterized by the blowing of wild and violent winds heralding the approach of hot season which lasts till middle of June.

2.2.4 RAINFALL

The district receives its rainfall (about 90%) from the southwest monsoon from June to September. The average annual rainfall is about 1135 mm. The rainfall generally increases as one goes from the west to the east.

Below shows rainfall data calculated for the period of 15 years.

Average rainfall 1224 mm

Maximum rainfall – 1715.8 mm In 1994

There was about 448 mm rainfall in the year 1986 on 14.8.86 within 24 hours in Waroratahsil.

The one day high rainfall of 448 mm on 14.8.86 resulted in very high and sudden floods in river Irai and its tributaries. Such flash floods do occur sometimes due to concentrated rainfall in catchment areas of river Irai and release of excess water from Irai dam by the authorities.

2.2.4 Land Use Pattern

Chandrapur district can be divided into two regions on the basis of district physiographic features.

1. The plain and the fertile region lying in river valleys of the Wardha, the Penganga and the Wainganga rivers- The widely spread and flat terrain exhibits mostly rolling topography with residual knolls of the hills in the southern portion while in the northern portion that is in Brahma Pur tahsil, fairly wide flood and alluvial plains covered with fertile loams are observed. The flat terrain of Chandrapur district on the whole lies generally between 250 m (MSL). In the Penganga valley, flat terrain covers very little area in the southwestern portion of the district. The area occupied by the Penganga basin in the south-western part of the district in Rajura and Chandur tahsil exhibits mostly hilly topography.

The hills

are known as Gadchandur and Manikgarh hills. The altitude in general rises to 500 m above MSL.

2. The upland hilly region - The upland hilly region lies between the Wardha and the Wainganga rivers comprising parts of Warora, Chandrapur and major part of Brahmapur tahsils. It has sandy soil. The mills in Wardha, Brahmapur and Brahmapur district are low altitude hills called 'Chimur-Perjagarh-Mul hills'. The altitude of these hills is on average 300 m above MSL.

The soil of the district is well defined and conducive for growing crops of various kinds. The most fertile soils are found in the Wardha district and Wainganga valleys. The numerous varieties of soils known by many local names they are grouped under the following representative classes.

Kali	This type of soil is mainly confined to ever intercast and is found in the valley of Wardha and Wainganga. It is suitable for only rabi crops.
Kanhar	It contains small amount of grit in the form of lime. Inferior type of Kanhar is known as bersi Kanhar and is coarser in texture. It is mainly noticed in Wainganga valley.
Mornand	It responds well to irrigation due to its loamy texture. Both kharif and rabi crops can be grown on this soil.
Khardi	This is light in color and full of stones. But when embanked sometimes improves itself into morandi. In the open it grows only til and jowar.
Wardi	It is principal rice soil of the heavy tracts. It is light colored soil as good as sand with just sufficient clay to keep it from crumbling in the dry season.
Pandhri	It is grey soil which is found in and around villages. It gets color and fertility from the ashes and refuse that accumulate upon it from the neighboring houses. It grows maize, tobacco and similar crops even without irrigation.
Retariandi Bardi	The first type of soil is mostly sand and second is nothing but pebbles.

The soil conditions along Wardha-Painganga valleys are rich with black regur loams and clay loams along the river bed. These soils locally known as kaskal soils, are very productive and suitable for rabi crops due to high moisture retention capacity. However, water logging is very common during monsoon and is therefore not suitable for kharif crops.

Table 2.4 Classification of landholders

In Chandrapur district, maximum number of the farmers (29.46%) lie in the small category having only 12.39% of the total landholding.

Category of farmers	Number of farmers	Land (Ha)	% to population	% of total landholding
0-1ha	113227	62751.60	37.21	11.60
1-2ha	97509	138960.20	32.05	25.68
2-5ha	78632	230926.00	25.84	42.69
5-10ha	13376	87084.00	4.40	16.09
10-20 ha	1360	16812.90	0.45	3.14
More than 20 ha	123	4379.90	0.05	0.80
Total	304227	540914.60	100	100

Table 2.5 Land Use Statics

1. Geographical area 143220 ha.
2. Forest area 137240.8 ha.
3. Non-Agricultural area 20039.4ha.
4. un-Agricultural area 35886.3ha
5. net-cultivated area 477102 ha.
6. Gross cropped area 520877 ha
7. Intensity of cropping 109.17 ha

2.2.5 Irrigation & Groundwater

The entire area of the district falls in the Godavari basin. The area is drained by major tributaries of the Godavari river. The major tributaries are the Wardha, the Wainganga and the Penganga rivers. The Penganga, flowing along part of the Western boundary, meets the Wardha river near Ghugus to form the Wardha river. It further flows in NW-SE direction finally merging into the Wainganga river at the southeastern corner of the district. After this confluence the river at the southeastern corner of the district. After this confluence the river along with their subtributaries rising in the uplands within the district drain whole area of the district. Rising in the uplands within the district drain whole area of the district.

The Wainganga river which flows along the border of Chandrapur and Gadchiroli district is the main river of the district.

The Wardha is the only perennial river in the district having the longest river course as compared to the other two major rivers. The main tributaries of the Wardha river are the Erarises in the northern part of Waroratahsil and flows along due south over a length of 80 km. till it meets the Wardha just south of Chandrapur at Wardha village.

The Penganga flowing along western border takes east west course and then joins the Wardha river at Ghugus. The area occupied by Gadchiroli tahsil and part of Rajuratahsil is drained by the Penganga and its tributaries. The main rivers in Chandrapur district are Wainganga, Wardha, Andhari, Irai, Painganga and Prnhita

2.6 Irrigation project & area in irrigation

Table 2.7 Source wise area irrigation

SN	Source	Area Irrigated (ha)
1	Canal	
2	Tanks	
3	Open Wells	
4	Tube/Borewells	
5	Lift Irrigation	
6	Other	
	Total	

2.9 District at a Glance**CHANDRAPUR DISTRICT AT A GLANCE**

Geographical area 11432.20 Sq.Km

Taluka 15

Normal Rainfall 1398mm

Temperature Maximum 47.2 Deg.C.

Temperature Minimum 7.1 Deg.C.

Per Capita Income (at Current Prices) Rs.4,755

Population Total 22,04,307

Male 11,23,834

Female 10,80,473

Density (Per Sq.Km.) 160 Per Sq.Km

Live Stocks (Husbandry) 1,136

Live Stocks (Poultry) 649

GrowthCenters:

(i)Warora(ii)MulLiteracy80.00 %

CommercialBanks257

Industries(BIG) 242

Industries(SMALL) 1503

IrrigationProject

(Medium) 8

IrrigationProject

(SMALL) 87

LanguagesbDialectsMarathi,Hindi,Gondi,Kolam

AdivasiDance,GhusadiDanceof

FolkArtsKolam,Gondhal,Dandar, Tamasha,Keertam

HealthInfrastructure

PHC's 58

RuralHospital24

PrimaryHealthSub-
Center 339

MobilehealthUnits7

TouristPlaces

RamalaTank,JunonaTankatChandrapur,GhodazariProjec
t,SatbahiniTapovanAtNaghbir,AdyalTekariatBramhpuri,
RamdegiatChimur,TadobaAndhariTigerProject.

HolyPlaces

ShreeMahakaliMataMandirAtChandrapur,

Industries

No.ofIndustrialEstate	8
TypeofIndustries	Engineering,MineralBased, Paper,Cement&Chemical
Totalworkforcein Industries	18969
No.ofChemicalIndustries	15
No. ofPipelinesCarryingChemical	Nil
No. ofPotentiallyhazardouslocation-	
Chandrapur	ChemicalLPGfuelling
Ballarpur	PaperMill,CoalMines
Ghugus	Cement,CoalMines
Bhadrawati	OrdanceFactory
Gadchandur	CementFactories

Table 2.10 Agriculture at a glance

Information regarding main agricultural crops, their cropping period and market area is as below:

Types	Names	Cropping Period in	Market (District, State, Export)
Major crops (Irrigated)	Kharif - paddy Cotton Soyabean Wheat Gram	Jun to Dec May to Feb Jun to Oct Oct to Feb Oct to Feb Jan to May	State & District fed. Cotton market District through APMC State & District -----”----- -----”-----
Major crops Non irrigated	Paddy Kharif Soybean Cotton Tur Mung Udid	Jun to November July to Oct Jun to Feb Jun to Dec Jun to Sept-----”-----	State & District State & District District (APNC, taluka) District -----”-----
Major Cash Crops	Cotton Chilli	May to Feb Jun to	As above Bhivapur & Nagpur
Major Plantations	Nil	--	--

Table 2.2.7 District Income

2.2.7 District Income:

Chandrapur is basically a rural district with limited industrialization and about 90% of population depends on Agriculture. Gross domestic product of district in 2005-06 at constant prices of 1999-2000 is 2948 crore with 2nd ranking after Nagpur, Sector wise classification of the district income in 2005-06 at constant price of 1999-2000 is as follows.

Table 2.11: Classification of GVA added by Agriculture in 2011-12 at constant price of 1999-2000

Sector	Contribution in Lakh
Agriculture	
Cereals	9014.12
Pulses	2592.63
Oilseed	8609.50
Drug and Narcotic	22.25
Condiment and spices	1266.63
Fruit and vegetable	5374.63
Fodder	2597.13
By product	4061.13
Total	33538.02
Animal Husbandry and Dairy	
Milk	2555.14
Meat and Meat Product	802.28
Poultry and poultry Product	749.28
Others	940
Total	5046.7
Fisheries	3829.28
Agriculture and allied sector	41414

In respect of per capita income of state, Chandrapur shares 1.6% with per capita annual income of Rs.73328 at current prices.

Considering 248423 farm families in the district and share of agriculture and allied sector in the GDAP, Annual income of farm family in the district is Rs.10994.

Table 2.12: Total GVA of Agriculture sectors (Rs. In Lakh)

Year	Total GVA
2007-08	49618
2008-09	35675
2009-10	51277
2010-11	40371
2011-12	45892
2012-13	29883
2013-14	39405

Source:- Directorate of Economics and Statistics, Mumbai.

Table 2.13: Share of Chandrapur district in the GVA of Agriculture with allied sector in State

Year	GVA of M.S. (Rs In Lakh)	GVA of Chandrapur (Rs In Lakh)	Share of Chandrapur district (%) in the Agriculture Sector of Maharashtra State
2007-08	3159656	59853	1.89
2008-09	2929173	43887	1.49
2009-10	3232699	57578	1.78
2010-11	3274475	48543	1.48
2011-12	3469083	55100	1.58
2012-13	3271399	40123	1.22
2013-14	35908664	49137	1.37
Av.	22997349	50603	2.20

2.2.8 Intra-district growth differentials

Data in respect of GVA of Agriculture sector of district in Nagpur division is compared with GVA of Gondia district. Data reveal that Chandrapur ranks 3rd in Nagpur division in respect of GVA contributed by the agriculture and allied sector.

Table 2.14 GVA of Agriculture and allied sector of district in Nagpur division

District	Fishery	Animal Hus. and Dairy	Agriculture	Total
Wardha	750.14	2556.85	57602.71	60909.70
Nagpur	2258.57	4356.57	107327.00	60909.70
Chandrapur	4282.28	3244.57	34643.85	113942.100
Gondia	5476.71	4978.14	14786.14	50466.27
Chandrapur	3828.85	4908.42	41729.00	42170.7
Gadchiroli	840.42	3900.85	14570.42	25240.99
Nag.Div.	17236.71	24500	269094.14	19311.69
M.S.	93341.42	355665.28	2862786	310830.90
				3311793.00

Table 2.15 Yearwise GVA of Agriculture & Allied sectors

(Rs In Lakh) at constant prices for 1999-2000

SN	Year	Agri & Hort.	Anim. Husban dry	Fisheries	Total
1	2007-08	49618	4317	5918	59853
2	2008-09	35675	5455	2757	43887
3	2009-10	51277	4283	2018	57578
4	2010-11	40371	5048	3124	48543
5	2011-12	45892	4941	4267	55100
6	2012-13	29883	5852	4388	40123
7	2013-14	39405	5399	4333	49137
	Av.	41731	5042.14	3829.28	50603

Table 2.2.8 Interdistrict growth differentials

Table 2.14 GVA of Agriculture and allied sector of district in Nagpur division

District	Fishery	Animal Hus. and Dairy	Agriculture	Total
Wardha	750.14	2556.85	57602.71	60909.70
Nagpur	2258.57	4356.57	107327.00	113942.100
Chandrapur	4282.28	3244.57	34643.85	42170.7
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Chandrapur	3828.85	4908.42	41729.00	50466.27
Gadchiroli	840.42	3900.85	14570.42	19311.69
Nag.Div.	17236.71	24500	269094.14	310830.90
M.S.	93341.42	355665.28	2862786	3311793.00

Under Nagpur division it seems that in respect of Agriculture sector Chandrapur district has wide scope for improvement of Agriculture sector next to the Wardha district.

Chapter-III

SWOT Analysis

3.1 Introduction

Strength, Weakness, Opportunity and Threats are four words that guide for development of any plan.

Every sector is having some strengths, weakness, opportunities and threats. These four words are very significant in the process of formulating the development plan. SWOT analysis in general represents the situation of the district and scope for development. Major activities related to Agriculture and Rural Development is divided in different subheads.

3.2 STRENGTHS

High rainfall:

Chandrapur district falls in XIth and XIIIth Agroclimatic zone which is characterized by high rainfall. Very few districts of the Maharashtra receive rainfall as high as 1330mm. Though the rainfall is high it is received in very short duration. Thus rainfall needs to be conserved.

Geographical Placement of District:

Chandrapur District is centrally situated in the country and is situated in Wainganga basin. Chandrapur is within periphery of 150 Km from two major cities Hyderabad, the capital of Andhra Pradesh and Nagpur which is second capital of Maharashtra which are well connected by rail and road. It has a common border with Nagpur, Chandrapur, Wardha, Gadchiroli and Andhra Pradesh.

Infrastructure:

It has an excellent banking network with easy credit availability. It has Krishi Vigyan Kendra and Zonal Agriculture Research Station operating under Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola located at Sindewahi, which is about 40 Km from headquarter. SAU Affiliated ones senior college located at Warora and three Agriculture Technical schools are located in Chandrapur district.

Self-sufficient in food grains:

Chandrapur, being predominantly a paddy growing area, is self-sufficient in food grains required for the population of the district. A large network of rice mills which convert paddy into rice makes the district self-sufficient in food grains.

Proximity to MIHAN:

MIHAN (Multi Model International Hub at Nagpur) project is being instated at Nagpur which is only 150 km from Chandrapur. The project after completion will boost Hi-Tech Horticulture in the district.

Irrigation Potential:

Chandrapur receives a good amount of rainfall. As per reports of the irrigation department around 111353 ha area is considered as the irrigated area which is about 21.38% of the total cultivable area. Chandrapur district is having a large number of open wells in the district which are used by the farmers for irrigation.

Paddy Processing units, coal mines power plants:

Network of paddy processing units in the district is a major industrial activity in the district which processes the paddy produced in the district.

Availability of natural resources for subsidiary occupations:

Chandrapur has a large number of palas (*Butea monosperma*) and Anjan, Aintrees vegetation. Palas is a host for lac insect (*Caricalacca*) and Ain, Anjan, Jamun, are the host for Tassar silk worm. These tree species are largely found on the bunds of farms which are being utilized for lac cultivation on a considerable scale, Tassar silk production to some extent.

Forest protection committees have been formed in the district which can be encouraged for forest based activities.

3.3 WEAKNESS:

Analysis of weakness is important for developing the district development plan. Major weakness of the different agriculture and allied activities are as follows.

Little Use of Hi-Technology:

Presently Hi-Technology adoption rate in the district is negligible. Only a few hectares are under micro irrigation system. Not only the area under Hi-Technology is low but other Hi-Tech measures like protected cultivation under Polyhouse, shade net house, fertigation is also negligible. High value crops like flower and vegetable are not grown by farmers on large scale.

Low Mechanization:

Paddy is major crop of the district. But due to very low holding of land the mechanization of paddy cultivation is minimal. Only ploughing and threshing operation is partially mechanized.

Large number of labourers are required for the paddy transplanting, weeding and harvesting due to shortage of labourers and low mechanization transplanting operation is delayed which results in the low productivity.

Low Water Use Efficiency:

Though district receive fair amount of rainfall, water conservation measure at farmer's level are least and method used for irrigation crops is flood irrigation for all the crops.

Little Awareness and Partial Adoption of Technologies:

Awareness about the technologies developed by the SAU and ICAR institutes is very low. Farmers know some of the technologies but adoption and application of these technologies is partial, which is one of the major reasons for the low productivity of different crop in the district.

Lack of Co-operative and Group Approach:

Co-operative movement amongst farmers has not developed in the district, neither from cultivation point of view nor from the processing and marketing agriculture outputs. There is wide availability of perennial surface water from rivers, nala and Malgujar tanks. Small lift irrigation schemes could not be formulated because of absence of Co-operative movement.

Non Availability of Continuous Electric Supply:

Electric Supply to the farms for the water lifting pumps is not continuous, which has hampered the productivity of Agriculture sector.

Low Productivity:

Productivity of most of the crops in the district is below national and state productivity because of the depletion of soil and low organic carbon content, lack of adoption of technologies and soil health needs to be focused through INM.

Low Area under Horticulture:

Area under horticulture crops specially fruit crops is less than 1% of cultivated land. The trend during last five years shows that area under perennial crops has not increased more than 150 ha per annum.

3.4 OPPORTUNITIES:

Potential for Large Number of Wells:

As per the GSDA reports, all the blocks of Chandrapur district falls under safe (White) Category for groundwater availability. As per the GSDA reports, presently number of existing wells is 44838. Additional 11000 wells if supplied uninterrupted electricity supply can bring about 10,000 ha additional area under partial perennial irrigation.

Mechanization:

Farm Mechanization, is presently limited to tractor. Mechanization of small farms can increase the productivity and reduce drudgery. Farm mechanization for transplanting, weeding, and reaping can increase the productivity.

Sericulture:

Agro-climatic situation in the district is suitable for sericulture. District Sericulture centre is established by Directorate of Sericulture, Nagpur at Chandrapur which can be utilized for procuring DFL. This activity can promote Tassar silk production in all blocks of the district.

Less Area under Forage Crops:

District is having large number of milch animals however; area under seasonal and perennial forage crops is negligible. which is one of the reasons for low productivity. Lack of knowledge and negligence for cultivation of forage crops however grazing land area available for grazing is 27906 ha.

Milk & Milk products:

Presently production of milk in Chandrapur district is 872 lakh litre which can be raised to 1086 lakh litre by enhancing cross breed cow rearing and A.I. to indigenous cows. It can also be raised by introducing improved buffalo breeds.

Poultry & Meat:

Egg production is 112 lakh nos. of the district which can be increased to 218 lakh eggs by introduction of improved dual purpose breeds like Giriraj, Vanraj etc.

Meat production can be raised to 2179.12 MT from 2448 MT.

3.5 Threats

Low Productivity and Low Net Returns from Paddy:

Paddy is major crop grown in the district, however productivity of paddy is less than the national and state average, and low productivity resulted in the narrow cost benefit ratio which ultimately has affected Agriculture Development of the district.

Unavailability of Labourers:

Paddy is labour intensive crop and requires about 25 labourers for transplanting of 1 ha paddy and 20 labourers for harvesting of paddy. Transplanting operation of all the farmer coincides, which results in severe shortage of labourers due to which transplanting is delayed that hamper the productivity of paddy.

Wild Animals:

Since large area is under forest, population density of wild animal is high and wild animals specially monkey, bears and deer are damaging crops of the farmers.

Erratic Rainfall:

Chandrapur receives an average rainfall of 1135mm however number of rainy days are limited to 50-55. Moreover maximum rainfall is received upto mid September. Generally there is shortage of water during grain filling stage that results in less yields and low productivity.

Shortfall in Seed Production and Seed Processing Unit:

Chandrapur is predominately paddy growing district; however depends for seed on states like Andhra Pradesh.

Technology gap:

Due to poor extension network there is lack of farmer's co-operation in developmental activities. Most of the agro processing industries are sick. Farm credit mostly used for personal benefit rather than farm development.

