EXECUTIVE SUMMARY

OF

PARBHANI DISTRICT

EXECUTIVE SUMMARY

E.S. 1. INTRODUCTION :

This comprehensive district agricultural plan (C DAP) :

a) Assesses the available natural physical and human resources in the district and possibilities of their fuller or better utilization for acceleration in growth with more scientific and technological methods and purposive investments;

b) Identifies the social, infrastructural, agronomical, and governance weaknesses which have so long impeded the processes of growth and development and led to backwardness, lower levels of living and poverty;

c) Recommends strategies and scores of practicable projects, schemes and programmes for overcoming the weaknesses along with estimates of financial out lays required and the outcomes expected from them; and

d) Suggests appropriate agencies for implementing the various projects, schemes and programmes along with the proposals for strengthening them and for raising their capabilities to match the requirements of effective implementation.

This (C - DAP) describes what the district can achieve over a medium term of three years and how it should work to achieve it. The C - DAP has been prepared with the following objectives:-

1) To continuously raise productivity, production, employment and income in agriculture and allied activities through optimal utilization of natural and human resources;

2) To strengthen, reorganize or newly build up physical infrastructure and institutions to effectively help adopt and operate modern technologies and practices to provide further impetus to agricultural growth and rural Development;

3) To provide food security and to eliminate hunger;

4) To focus all activities in support of small and marginal farmers, poor and disadvantaged people with a view to secure social justice and to reduce poverty and distress;

5) To continuously improve economic well being and quality of life of all stake holders in the district; and

To help the district to take off on a faster track of growth and sustainable development.

Along with crops and their productivities, the C-DAP deals with all the infrastructural and allied activities like soil health and conservation, optimal utilization of land and water resources, adequacy and purity of inputs, credit, marketing, livestock, dairying, poultry, fisheries, sericulture, agro-processing, agro services and strengthening of research, education and extension services, for a continuing technological up-gradation of the entire farming system. These goals and the strategies (meaning courses of action) to achieve them have been discussed in the CDAP for different sectors and services supporting them.

PARBHANI DISTRICT:

Parbhani district is located on the Deccan plateau the Eastern side of Maharashtra State. It is bounded a North by Buldhana and Hingoli districts, while at west by Jalna district. To the South it is bounded by Beed and Latur districts and to the East by Nanded district. It is located between 18.45^0 and 20.01^0 North latitude and 76.13^0 to 77.29^0 East longitudes. The Ajanta hill ranges run through Jintur Taluka of Parbhani district, and Balaghat hill ranges run through Gangakhed Taluka of the district. The district comes under Godavari and Dudhana river valley. Parbhani district is located about 457 meters above the sea level.

The total geographical area of Parbhani district is 6311 sq.kms. There are 9 talukas in the district. These are Parbhani, Jintur, Gangakhed, Pathri, Purna, Palam, Sailu, Sonpeth and Manwat. There are 1 municipal corporation, 7 Municipal councils, 9 Panchayat Samities and 704 Gram Panchayats in the district with a total number of 848 villages.

Godavari is the most important river which rams through this district. Dudhana and purna are the two other major rivers. There is one major irrigation dam at Yeldari in Jintur Taluka on Purna river in Parbhani district.

Parbhani district comes under assured rain fall zone of the state. The average rainfall is 774.59 mm. The district has black soil rich in nutrients. The depth and Fertility of soils differs from Taluka to Taluka. Taking into account the fertility of soils, the district can be divided into 3 parts

i) Soils in the Godavari valley are fertile and deep.
ii) The central part of the district (Sailu, Pathri, Parbhani and Purna is having medium black soils.
iii) Hilly areas in North and Gangakhed, Palam talukas in the south have medium and low quality soils.

According to 2011 census, the total population of the district was 18.36 lakhs, of which 9.42 lakh are male, while female population was 8.93 lakh. The sex ratio observed in the district is 947 females as against the 922 .females as states average. The rural population of the district is 10.43 lakh indicating rural dominance. SC population was found to be 2.47 lakhs, (13%) while the total population of scheduled Tribes was 040 lakh i.e. 2.3% of the total population of the district Density of population in Parbhani district is 192 per sq.km area as against state average of 315 persons per sq.kms.

E.S. 2: VISION, GOALS AND THE MAIN POINTS OF SWOT :

A ten year vision for the district is that:

i) It should be doubling its production from agriculture and allied activities;

ii) It should have modern physical, social and institutional infrastructure;

iii) It should have healthy sustainable environment and full employment; and

iv) It should be free of poverty, ignorance and social or gender disparities.

The goals for the Medium term of 5 years of the twelveth plan should be to ;

i) Quickly set all the processes of growth and equity in motion in a mission mode;

ii) Achieve a growth rate of not less than 4% per annum for agriculture and not less than 8% per annum for allied activities;

iii) Promote and activate Gram Panchayats to functionally contribute to improvement of primary education, health services minor irrigation and agricultural production; and

iv) Organize asset poor and asset less farmers into self help groups and help them transform into providers of services critically beneficial in rejuvenation of agriculture of the village including their own holdings and thereby reduce poverty to less than 15 percent;

The SWOT analysis shows what the district is capable of doing; what it is doing and what it should be doing. The district has substantial but underutilized potential of irrigation. It has a capability of raising higher value crops and raising productivities of almost all the crops with better cultivation practices. The district has inherently good soils but they have been getting degraded for long for want of watershed development works as well as lack of nourishment based upon soil testing and scientific advice. Thirty percent of lands are owned and operated by small and marginal farmers who make almost 75 percent of all farmers. They are generally poor and do not afford to keep even a pair of bullocks. Those small farms are non-viable and because of indifferent cultivation are not making any contribution to agricultural production. As a result 75 percent of all farmers owning and operating those nonviable farms are all poor and living a life of bare existence.

The greatest infrastructural gap likely to impede the process of growth is the shortage of electricity supply and the load shedding in the rural areas for the whole day and more.

There appear to be many executive gaps as well, which are likely to slow down the process of implementation of CDAP projects, schemes and programmes. Presently the coordination linkages between different departments and between the different wings of the agriculture department are weak. The interface between the activities of government departments and those of Panchayat Raj Institutions is weaker. Those gaps would make a great difference as performance of most of the entities in the district is at mediocre levels.

E.S. 3 AREAS AND SECTORS WHICH NEED TO BE ADRESSED:

On the background of the vision, medium term goals and the SWOT analysis of the district we have identified a few areas and sectors to be addressed and formulated a few strategies, schemes, projects and programmes for implementation during the eleventh five year plan. More important of them are briefly described below:

1) Watershed development – project is to complete watershed development work on all lands not tackled so far.

2 - Minor Irrigation – 112000 new wells – 50000 farm ponds and 66000 micro irrigation systems. Good maintenance of existing M.I. schemes and restoration of those in disrepair.

3 - Net work of taluka-wise soil testing laboratories, upgrading of the existing laboratory at the dist. H.Q. and organizing local services for drawing soil samples and for reaching them upto laboratories.

4 – Strengthening of extension services and intensification of training and demonstrations.

5 – Organising asset poor and asset-less farmers into self help groups and empowering, training and helping them to transform themselves as providers of services critically beneficial to the village community. Because of their services their nonviable farms would be joining in the production line and because of additional employment and income they will be coming out of the poverty trap.

6 – Supporting and functionally activating Gram Panchayats, Panchayat Samities and Zilla Parishad to positively contribute towards i) improvements in primary education and health services; ii) Development of minor irrigation and restoration of existing schemes now in disrepair; iii) Organising asset poor and asset-less farmers into SHGs, help them undertake agro-services, to create employment and reduce poverty; and iv) to actively participate in all CDAP projects, schemes and programmes under implementation for raising agricultural production of the district.

7 – Ensuring adequacy, timeliness and purity of all input supplies;

8 – Strengthening of implementation agencies. Particular attention is given to provide for participation by Panchayat Raj Institutions, NGOs and non-official experts at all levels. They are to be organizationally strengthened and motivated so that they participate in implementation of CDAP with enhanced capabilities more effectively.

9 – The following areas need special attention for development;

i) Horticulture development, especially banana,,mosambi and mango, etc. needs special attention.

ii) There is a big scope for the development of agro-based, food processing industries in Parbhani district. Cotton-based industries like, ginning, pressing, spinning mills have good scope.

iii) Remote sensing techniques have identified numerous local pockets having ground water lineaments and thus having rich potential. Exploitation of that potential and its optimum use through micro irrigation systems should receive priority.

10 – The CDAP to be implemented in a mission mode, supported by all official and non-official agencies, backed by powerful media and publicity efforts, monitored, supported and inspired by the highest authorities in the State and Central Governments.

11 – As Parbhani District is short of water. It is necessary that all farmers are given a high subsides at 90% of the cost of drip/sprinkler irrigation system.

E.S. 4 VARIOUS ON-GOING PROGRAMMES IN THE DISTRICT – A BRIEF CONTEXTUAL GIST:

Reduced public investment in agriculture and allied sectors during last decade has resulted in decline in growth rate of agriculture. Therefore, there is an urgent need of enhancing investment in agriculture (both public and private) to augment productive capacity. As public extension system empowers farmers technologically and economically, it needs to be adequately strengthened.

A large number of schemes and projects sponsored both by the central and State Governments are implemented and are operational in the district. There is need to network and co-ordinate these schemes/projects to empower farmers for enhancing agricultural productivity through resource use efficiency.

Major schemes implemented at the district level are:

AGRICULTURE:

1. Integrated cereal development.
2 Rapid maize development
3. National pulse development.
4. National Oil-seed production.
5. Sugarcane development.
6. Integrated cotton development
7. Seed quality testing.
8 National food security mission.
9. Cropsap.
10. Dryland farming mission.
11. Enploment Linked Horticulture Development.
12 Nursary Management.
13. Micro irrigation system
14. National Horticulture Mission (NHM).
15. Organic farming.

SOIL AND WATER CONSERVATION:

16. Intrgated Watershed Mangement Program.
17. River-Vally Project.
18. Farmers participation in national programme of soil and water conservation.
19. Saline & Sodic Soil development
20. Marathwada Watershed Development Mission Programme

EXTENSION:

21. Gender sensitization and participation.
22. Information support to agril extension.
23. Soil, Water, testing.
24. Bio-pesticide production
25. State extension reforms (ATMA)
26. Natural disaster management.
27. National Agril Insurance.
28. Agri-polyclinics and farmers training.
29. Shetkari Magazines and publication.
30. Awards and incentivization scheme.

Details of CDAP proposals are given in chapters IV, V and VI, along with targets and outcomes and costs for each. The above table is the summary of financial outlays of the CDAP shown separately for both new and ongoing projects, innovative schemes and programmes.

Total outlay proposed in this C-DAP is Rs 24720.77 lakhs out of which Rs 12449.37 lakhs is for new projects. (stream I) The total outlay for the CDAP works out to Rs 19808.00 per capita for rural population of the district. The CDAP will improve the per annum per household agricultural production from Rs. 45310 to Rs 69,063./-.

In stream II, we have mainly included ongoing schemes. The department may have to reexamine stream II proposals both for adequacy of allocations and inclusion of all on going schemes.

CDAP has assumed that all approved and ongoing major irrigation projects would be completed in the twelveth plan period. The total outlay required for completing them is …. crores. This is not included in CDAP proposals as we are sure the department of water resources will provide them outside the CDAP. It would be desirable that Ministry of Agriculture pursues this case with Ministry of water resources and ensures that adequate provision to complete & modernize irrigation projects are provided adequate budget

E.S.6 PUBLIC PRIVATE PARTNERSHIPS THAT CAN BE ENVISAGED IN THE C-DAP:

The Planning Commission has set a very high target for investment in infrastructure sector. The Eleventh Five year plan would be consequentially looking out for the possibilities of Public Private Partnerships (PPPs) to meet a part of the investment needs. The CDAP proposals also have a large element of investments in watershed development and minor irrigation. Both these types are small and widely scattered works spread all over the rural areas. Moreover, the individual beneficiaries can be identified for minor irrigation works like dug wells and farm ponds but not for watershed development. If, however, it is necessary to bring in more investments through the PPP route, mandal-wise or village cluster wise lots of all the three types of works combined can be made for appropriate sizes of investment say 10, 25 or 50 crores. All aspects of tendering, contracting and other modalities may have to be handled by the department of Agriculture as the Chief Authority for implementing the CDAP. Implementing projects through the PPPs should, however, be more challenging than that under conventional practices. One advantage of PPPs should, obviously, be timely and speedy completion of projects enabling reaping benefits of the works relatively very fast. It is suggested that the implementation of CDAP projects should not, in any case, be tied up with EGS funds and the availability of local unemployed labour. Agriculture growth is more important and speedy implementation of CDAP will do much more for reducing unemployment and poverty and rural development. PPP pattern is likely to use machines and keep to the time schedules without which a part of soil work done under conventional methods and even in private sector goes waste because of delays or untimely rains

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Another project for which PPP may be envisaged is setting up of eight taluka-wise soil testing laboratories, upgrading of the district H.Q. – Laboratory and operating the entire net work for five years.

Other projects which may attract PPP are setting up and operating a large wheat flour mill and a plant for production of modern agricultural tools, implements and small machines and repairs to all machines. The CDAP has, however not proposed any out lays for this last group of agro industries.

E.S..7 EXPECTED OUTCOMES AS A RESULT OF IMPLEMENTATION OF THE PLAN:

This comprehensive district Agriculture plan C-DAP, has been prepared under the guidelines of the RKVY. It deals with all these issues comprehensively. It attempts to provide solutions to overcome several impediments which are presently obstructing the development process. It presents scores of actionable projects, schemes, and programmes which, if implemented properly will help the district to shed out its agricultural backwardness and to take off on a fast growth track of much higher than 4% per annum growth of agricultural production.

As a result of implementation of the CDAP all sectors are expected to have a substantial addition to the gross production in the distric

TABLE
GROSS VALUE ADDED IN VARIOUS SECTORS PARBHANI DISTRICT 2012-2017

Sr. no.	Sector	3 years average gross value 2009-10 to 2011-12 in lakh	Gross value 2016-17 in lakhs	Compound annual growth rate %
1	Agriculture	122669	170916.00	6.86
2	Horticulture	16210.86	45886.55	23.10
3	Animal Husbandry	2344.00	3170.00	6.22
4	Sericulture	15.03	27.00	12.42
5	Fisheries	16440.00	20340.00	4.35
Total		157678.89	240339.55	8.79

Highest growth is in the horticulture sector both because of expansion of areas and increase in productivities. Significant increases in production and productivities will, however, accrue in the next four years when, very large plan investments in watershed development and minor irrigation start bearing fruit.

The proposals of C-DAP will provide employment to thousands of unemployed or partly employed people, raise standards of living in rural areas, reduce poverty and distress, and specially reach the benefits of growth and development to the thousands of small and marginal farmers who are mostly in distress today because of the non-viability of their farms and several other consequential handicaps. Naturally, this last group of small and marginal farmers and their handicaps are the focus of attention of many C-DAP proposals.

Earnest implementation of all C-DAP projects, schemes and programmes will result in simultaneous increments in productivity of each crop and each of the allied activities, in each farm in each village, and in each block in the district. Combined with improvements in credit, marketing. Employment and other infrastructure, the overall growth is bound to have a multiplier effect. It should be certainly possible to raise farm production and farmer incomes at least by 50% over a medium term of five years. That should mean the beginning of the Second Green Revolution. The momentum generated, the self confidence gained by the farmers in the process and the continuing upgrading of agro- technologies will continue to lift the district economy to higher and higher levels in future. Outcomes of all the efforts will remain in the farmer's hands. No one else will claim any share or tax from them. Even the access to credit will be much easier and cheaper than what it has been during the past several decades. Accomplishment of this C-DAP will thus lead to the most desired well-being of the people of the district.

OUTLAYS AND OUT COME

Total outlay (Rs. lakh)	=	Rs. 24720.77
Stream I	=	Rs. 12449.37
Stream II	=	Rs. 12271.4
Per capita outlay/ during XII plan	=	Rs.19808
(population)	=	

OUTCOME
Gross Value Added (GVA) Constant Prices

	GVA of		(Rs. lakhs)
1)	Average of 3 years 2010-11 to 2012-13	=	Rs. 157678.89
2)	GVA of final year 2013-14	=	Rs. 240339.55
3)	Compound Growth Rate	=	8.79 %
4)	Improvements in Gross value per from	=	Rs. 45310
	Cultivator to	=	Rs. 69063
5)	Improvement in GVA per annum per capita (rural population)	=	Rs. 12635 to 19258

CHAPTER – I
INTRODUCTION

1.1 OBJECTIVES:

This Comprehensive District Agricultural Plan (C - DAP) describes what the district can achieve over a medium term of five years and how it should work to achieve it. The C – DAP has been prepared with the following objectives:-

1) To continuously raise productivity, production, employment and income in agriculture and allied activities through optimal utilization of natural and human resources;

2) To strengthen, reorganize or newly build up physical infrastructure and institutions to effectively help adopt and operate modern technologies and practices to provide further impetus to agricultural growth and rural Development;

3) To provide food security and to eliminate hunger;

4) To focus all activities in support of small and marginal farmers, poor and disadvantaged people with a view to secure social justice and to reduce poverty and distress;

5) To continuously improve economic well being and quality of life of all stake holders in the district; and

6) To help the district to take off on a faster track of growth and sustainable development.

Along with crops and their productivities the C-DAP deals with all the infrastructural and allied activities like soil health and conservation, optimal utilization of land and water resources, adequacy and purity of inputs, credit, marketing, livestock, dairying, poultry, fisheries, sericulture, agro-processing, agro services and strengthening of research, education and extension services, for continuing technological up gradation of the entire farming system.

These goals and the strategies (meaning courses of action) to achieve them have been discussed in the following chapters on different sectors and services supporting them. All the strategies are designed to continuously raise productivity.

The C-DAP proposals will provide employment to thousands of unemployed or partly employed people, raise standards of living in rural areas, reduce poverty and distress, and specially reach the benefits of growth and development to the thousands of small and marginal farmers who are mostly in distress today because of the non-viability of their farms and several other consequential handicaps, Naturally, this last group of small and marginal farmers and their handicaps are the focus of attention of many C-DAP proposals.

The most important aspect of C-DAP is the implementation of strategies. For doing it effectively we have to strengthen, reorganize or newly build up physical infrastructure and institutions to effectively help adopt and operate modern technologies and practices and to provide further impetus to agricultural growth and rural development.

Earnest implementation of all C-DAP projects, schemes and programmes will result in simultaneous increments in productivity of each crop and each of the allied activities, in each farm in each village, and in each block in the district. Combined with improvements in credit, marketing, employment and other infrastructure, the overall growth is bound to have a multiplier effect. It should be certainly possible to raise farm production and farmer incomes at least by 50% over a medium term of five years. That should mean the beginning of the Second Green Revolution. The momentum generated, the self confidence gained in reprocess and the continuing upgrading of agro- technologies will continue to lift the district economy to higher and higher levels in future. Outcomes of all the efforts will remain in the farmer's hands. No one else will claim any share or tax from them. Even the access to credit will be much easier and cheaper than what it has been during the past several decades. Accomplishment of this C-DAP will thus lead to the most desired well-being of the people of the district.

1.2 GOVERNMENT OF INDIA'S INITIATIVES :-

The Government of India has taken several significant initiatives during the last 8/10 years. A few of them may be mentioned :-

i) The task force on revival of co-operative credit institutions (Vaidyanathan committee) constituted in 2004; It reported in December 2004.

ii) Launching of the Mahatma Gandhi National Rural Employment Guarantee scheme in 2006.

iii) Constitution of an Expert Group on Ground water Management and ownership 2013..

iv) National Farmers Commission 2006. It submitted five reports.

v) Declaration of National Policy on Farmers 2007

vi) Launching of Food Security Mission 2013

vii) Establishment of National Rainfed Areas Authority 2007

viii) Launching of Rashtriya Krishi Vikas Yojana (RKVY) 2007,

ix) Watershed Development and micro irrigation programmes;

x) The Loan waiver scheme for farmers 2008.

xi) Backward Region Grant Fund (BRGP)

xii) Extention of woman SHG program – Ajeevika National Livelihood Mission.

The Planning Commission's approach paper to the 12th five year plan also reflects the national concern for inclusive growth. In fact,. that paper is titled" Towards a faster and more inclusive growth. The pro-poor inclusiveness is bound to be the future strategy of development. It shall be operative in two ways. First is that sectors like agriculture which had been neglected in the earlier decade would again be contributing to the vibrant economy. Second is that the poorer sections of the population whom the earlier growth process had bypassed shall be enabled to fully engage themselves with the development process.

The core purposes behind all the above initiatives are;

1) Rejuvenation of Agriculture and reversal of the downward trend in agricultural production;
2) Acceleration of growth of agricultural production;
3) Optimal utilization of land and water resources;
4) Creation of additional employment;
5) Reduction of poverty;
6) Immediate relief to indebted farmers;
7) Decentralized development planning with reference to location specific, potentials, needs and problems
8) Special attention to and focus generally upon poor and especially upon small and marginal farmers whose farm holdings are not viable and who for this and several other handicaps live in poverty and distress.

Looking to the above initiatives and the core purposes underlying them generally, and especially to the RKVY with its assertive precondition of decentralized comprehensive District Agriculture Plans (C-DAPS) based upon agro climatic variations, location specific potentials , needs and problems , one can confidently say that the bad days of neglect and indifference towards this district , its development potential , its needs and its problems are at last gone. In their place a new era has dawned in which well organized and determined efforts of each and every farmer will be enthusiastically and actively supported by Gram Panchayat, NGO's. Local Technology Support Groups Banks, and higher entities in the Agricultural Department, District Administration. KVKs and the Agricultural university. The GP, NGOs and the village TSG will together ensure that no farmer or no farm remains out of the campaign or remains unsupported . Generally , the farmers will need technological advice on soil health , soil nutrients, fertilizers,, adequate and pure seeds and harvesting or marketing . The poor small and marginal farmers would , in addition , need support of agro-services, bullocks , tools implements etc, and a sort of small working capital loan for payment of those services. A tripartite arrangement may have to be made between a Bank , GP and the individual small farmer or a self help group formed by a group of small farmers for meeting expenses up to harvesting time.

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APPENDIX - II

METHODOLOGY – TECHNICAL NOTE:

The following methodology is adopted in different chapter analyses of the problems and to suggest solutions. –

Estimation of Intra-District Growth Differentials: For estimation of intra-district (or inter-taluka)difference, the district average is considered as the base or (100). The productivity of each crop a the district level has been compared with the productivity of that crop at taluka level and productivity indices prepared.

Finally, the productivity indices of 12 major crops in each taluka are added and a composite' index of all crops was prepared. This composite index represents the intra- district growth differentials of that district. (Chapter II)

Lorenz curve: To measure the inequality in distribution of land holdings and land operated by various categories of farmers (marginal, small, large farmers) the well known method of Lorenz Curve is used. Two Lorenz Curves are depicted for the State of Maharashtra, to understand the level of inequality at the district compared to the state levels.

Growth Rates: For estimating the projected level of output at given period of time (for 5 years) compound growth rates (CGR) are used. i.e. 4% for agriculture, and 6% for allied activities'.'-The following formula is used.

$$A=-P\left(\frac{1+r}{100}\right)^{n} \text{..... ...(1)}$$

Where, A = Amount or final output,

P = initial output,

R = growth rate,

N = number of years.

GAP ANALYSIS:

For estimating the difference between district/taluka level per hectare productivity and the productivity per hectare of Front Line Demonstration, the gap analysis is followed.

Formula for estimating growth rate: $R = \{(A/P)^{1/n} – 1\}$

Estimation of trend growth rates:

For estimating the long-term growth rates of the past 8-10 years of each crop (i.e. 2004-05to 2013-14) the method of Least square is followed :

i) $Yc = a + bx$ 2004 – 05 to 2011 – 12 .(i) for estimating trend growth rate

Usefulness of the method : Generally productivity / production of crops differs from year to year, may be due to climatic conditions scanty & irregular rainfall, diseases, etc. the least square method eliminates such fluctuations and a trend growth rate over a period can be obtained. This trend growth rate can be used for projections during the 5 year period.

Estimation of Gross Value Added of Districts: For estimating the Gross Value of output of agriculture, horticulture, floriculture, milk, meat, eggs, fish etc. we have used 2004-05 prices (constant prices) so as to understand the real changes in the value of output. The prices have been obtained from the respective APMC offices, of the district.

Estimation of income of various categories of farmers: After estimating the Gross Values of output of each district, this total value of output has been allocated to each category of cultivators in their proportion, i.e. proportion of marginal farmers; small farmers, medium and large farmers, etc. This allocated proportion is divided by the total number of farmers in each category so as to obtain average income of the cultivator in each category.

(i) This kind of estimation is made at two points of time, i.e. base year (2011 - 12) and final year 2016-17. This will enable us to find out the changes in level of incomes of the cultivators at two points of time.

(ii) The Compound Growth Rate of incomes of cultivators are also estimated at two points of time.

CHAPTER - II
GENERAL DESCRIPTION OF PARBHANI DISTRICT

2.1 INTRODUCTION:

The XI Five year Plan aims at the improvement of the farming community in particular and the rural masses in general through investments in agriculture and allied sectors of the Indian economy. To achieve this broader objective the Govt. of India has initiated a number of projects/programmes/schemes during the XII Plan period, 2012-13-2016-17.

A) WHY COMPREHENSIVE-DISTRICT AGRICULTURE DEVELOPMENT PLAN (C-DAP)

1) To raise productivity, production employment and income in agriculture *&.* allied sectors.
2) To achieve optimal utilization of natural and human resources.
3) To strengthen, recognize and build up physical infrastructure and institutions.
4) To ensure higher adoption or modern technologies.
5) To provide further impetus to agricultural growth and rural development.
6) Provide food security and eliminate hunger.
7) To secure social justice by focusing all activities / programmes in support of small and marginal farmers, poor & disadvantaged people.
8) To reduce poverty and distress.
9) To continuously improve economic well being and quality of life of all stake holders in the district.
10) To help the district to take off on a faster track of growth and sustainable development.

B) GROWTH TARGETS:

i) The twelveth Five year Plan (2012-17) has set the 4% growth target for agricultural sector; and
ii) 6% for the allied sectors, like, animal husbandry and agriculture, sericulture, fisheries, etc. per annum.

INTRODUCTION:

During ancient period, Parbhani was known as "Prabhavati Nagar". The district is located on the Deccan plateau on the Eastern side of Maharashtra State. It is located about 457 meters above the sea-level.

GEOGRAPHICAL LOCATION, AREA ETC:

Parbhani district is located between 18.45^0 and 20.01^0 North Latitude and 76.13^0 to $77\text{-}29^0$ East longitude. It is bounded at North by Buldhana and Hingoli districts, while at West by Jalna district. To the South it is bounded by Beed and Latur districts and to the East by Nanded district. The Ajanta hill ranges run through Jintur Taluka of Parbhani district. The Balaghat hill ranges run through Gangakhed Taluka of the district. The district comes under Godavari and Dudhna river valley.

ADMINISTRATIVE SET-UP:

The total area of Parbhani district is 6511 sq. kms. There are nine talukas in the district they are as follows:

1) Parbhani 2) Jintur 3) Gangakhed 4) Pathari 5) Purna 6) Palam 7) Sailu 8) Sonpeth and 9) Manwat. For administrative convenience, the district has been divided into 4 sub-divisions; under sailu sub-division, the following talukas are included, viz.1) Sailu 2) Jintur 3) Pathri and 4) Manwat, and under Parbhani sub-division, the following 5 talukas are included, viz. 1) Parbhani 2) Purna 3) Sonpeth 4) Gangakhed and 5) Palam. There are 1 municipal corporation, 8 Municipal councils; 9 Panchayat Samities and 704 Gram Panchayats in Parbhani district, with a total no. of 848 villages.

NATURAL RESOURCES IN THE DISTRICT:

RIVER SYSTEM:

Godavari is the most important river which runs through this district. Dudhna and Purna are other two major rivers of the district. Godavari River runs through Pathri, Gangakhed, and Palam talukas of the district for about 79 kilometers and then enters into Nanded district towards East. Dudhana River runs through Sailu, Jintur, Parbhani, and Purna tahsils and then enters into Hingoli district to the East. There is one major irrigation dam at Yeldari in Jintur Taluka on Purna River in Parbhani district.

RAINFALL, CLIMATE AND SOILS:

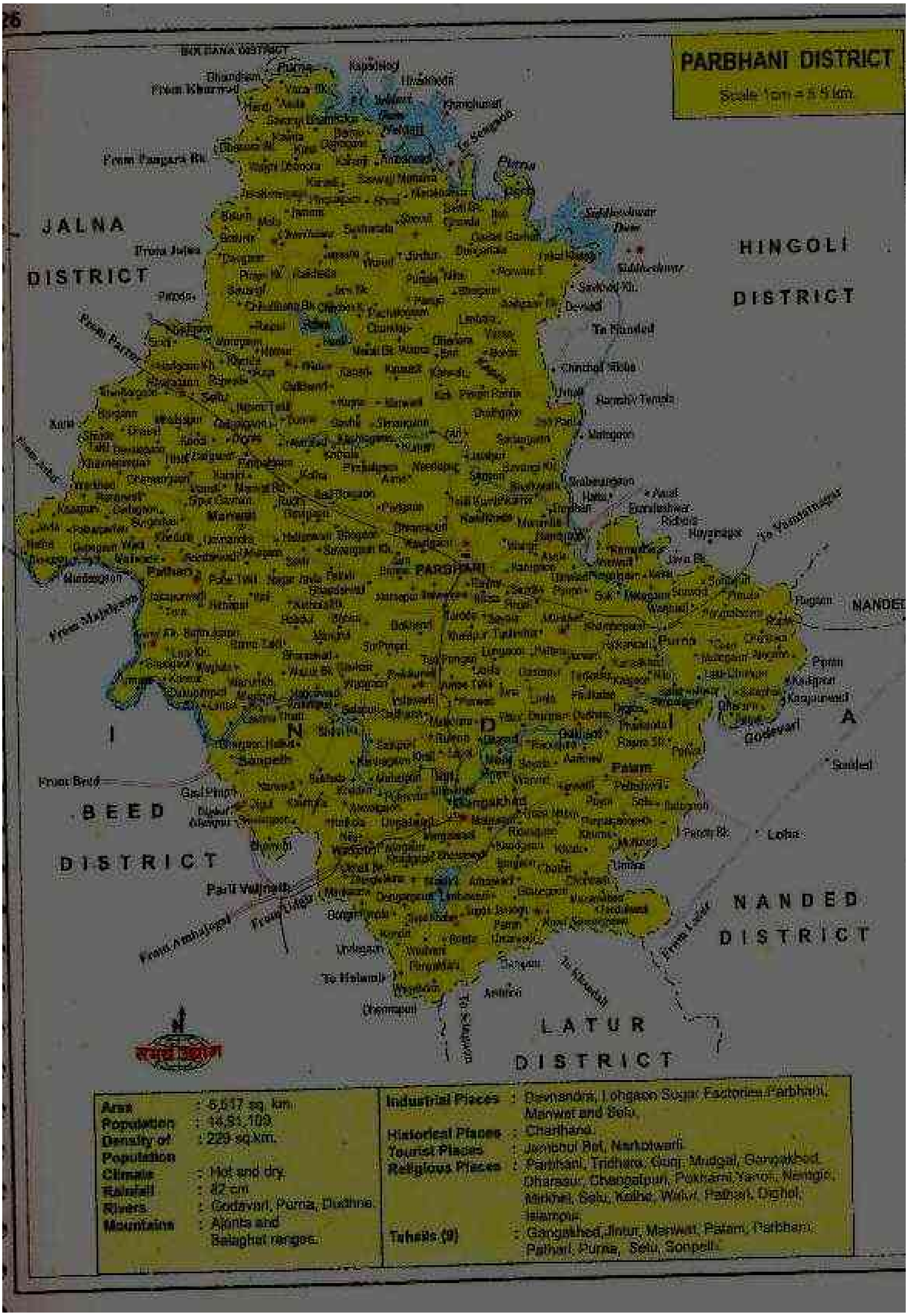
Parbhani district comes under the assured rainfall zone of the state. During June to December the district receives 774.59 mms of rainfall from North – East monsoons. Again during October and November, the district – receives 102 mms. of rainfall from Eastern Monsoons, every year. It may be stated here that the distribution of rainfall is not uniform in all the district. The proportion of rainfall increases as we move towards eastern part of the district.

During the rainy season which starts from June and ends in September, the other seasons are mostly dry. The raining season again starts in October and ends in November. Between December & February end the district experiences winter seasons. During the months of March up to May, the district passes through the Summer Season. During the year 2004, the maximum and minimum temperatures of the district recorded 42.2`$c^0$ and 13.4`c^0, respectively.

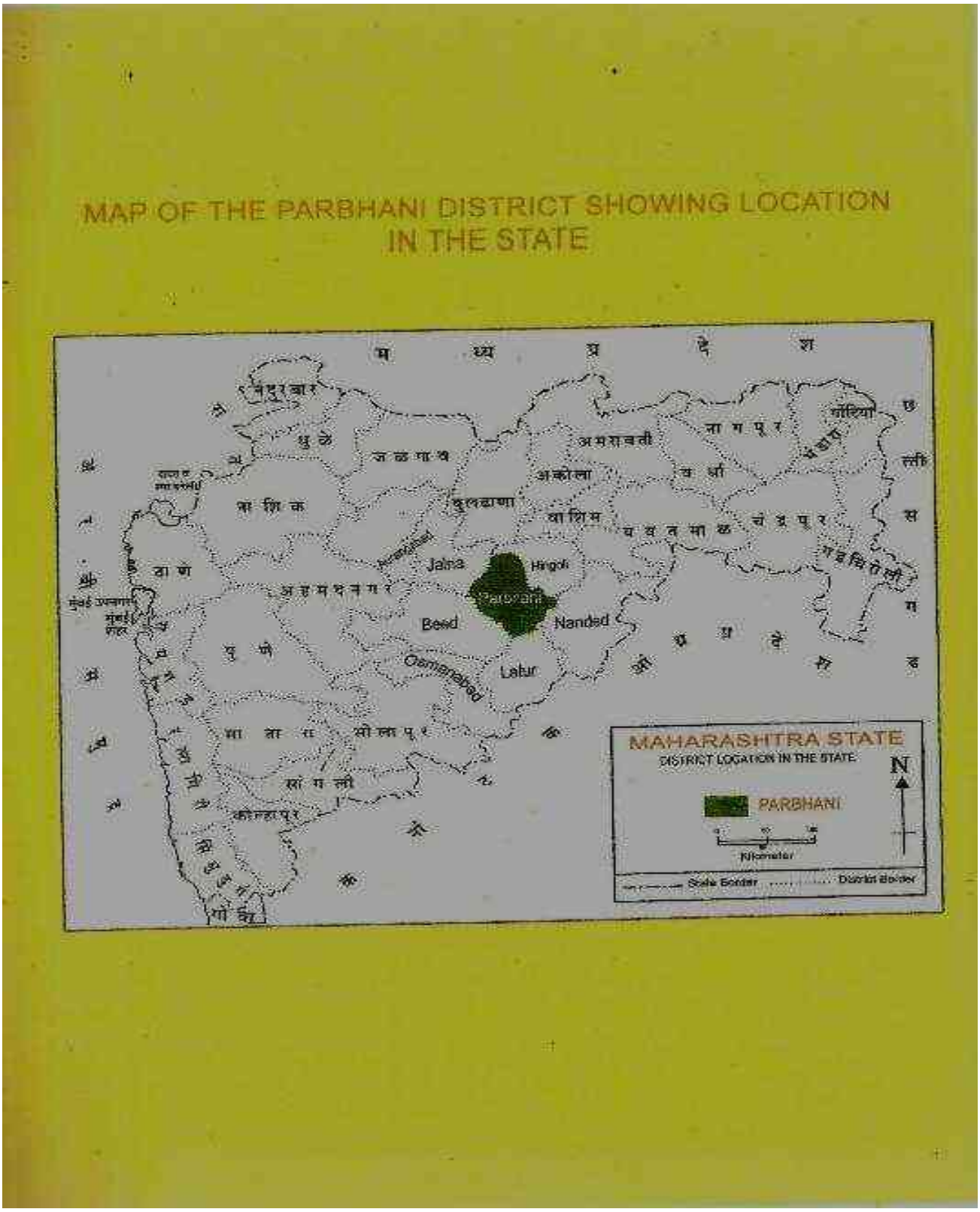
Parbhani district has black soil rich in nutrients. The depth and fertility of soils differs from Taluka to Taluka taking into account the fertility of soils, the district can be divided into 3 parts.

a) Soils in the Godavari Valley are very fertile, deep and rich in nutrients.
b) The central part of the district comprising of sailu, Pathri, Parbhani, and Purna talukas, and a part of Jintur Taluka the soils are medium block.
c) Hilly areas north of the district and Gangakhed and Palam talukas in the South, have medium and low quality soils.

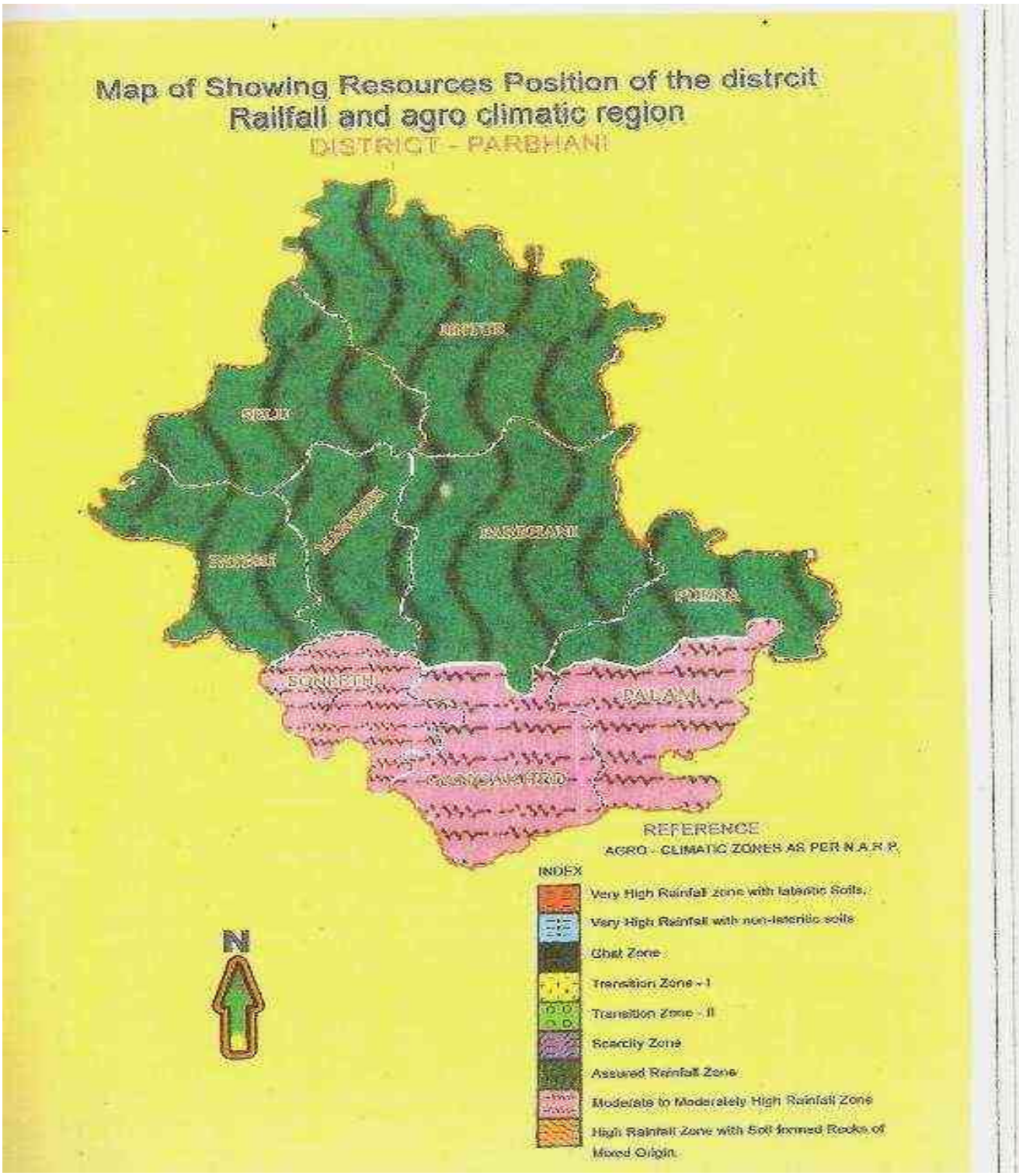
Map 2.1


PARBHANI DISTRICT
JALNA DISTRICT
HINGOLI DISTRICT
NANDED DISTRICT
LATUR DISTRICT
BEED DISTRICT
PARBHANI
Area : 6,517 sq. km.
Population : 14,91,109
Density of Population : 229 sq.km.
Climate : Hot and dry.
Rainfall : 82 cm
Rivers : Godavari, Purna, Dudhna.
Mountains : Ajanta and Balaghat ranges.
Historical Places : Charthana.
Tahsils (9) : Gangakhed, Jintur, Manwat, Palam, Parbhani, Pathari, Purna, Selu, Sonpeth.

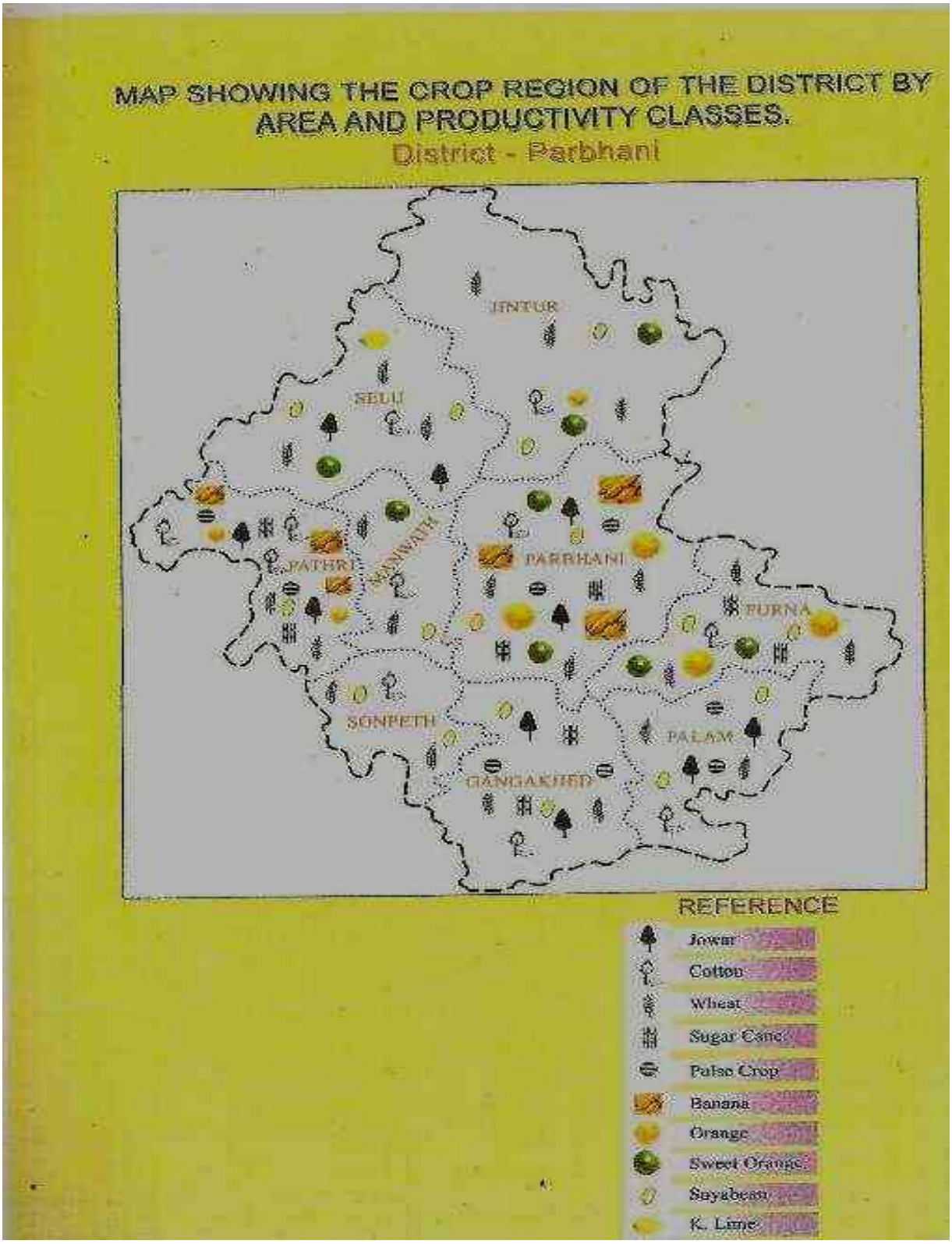
Map 2.2


MAP OF THE PARBHANI DISTRICT SHOWING LOCATION IN THE STATE
Jalna
Hingoli
Parbhani
Beed
Nanded
Osmanabad
Latur
MAHARASHTRA STATE
DISTRICT LOCATION IN THE STATE
N
PARBHANI
Kilometer
State Border
District Border

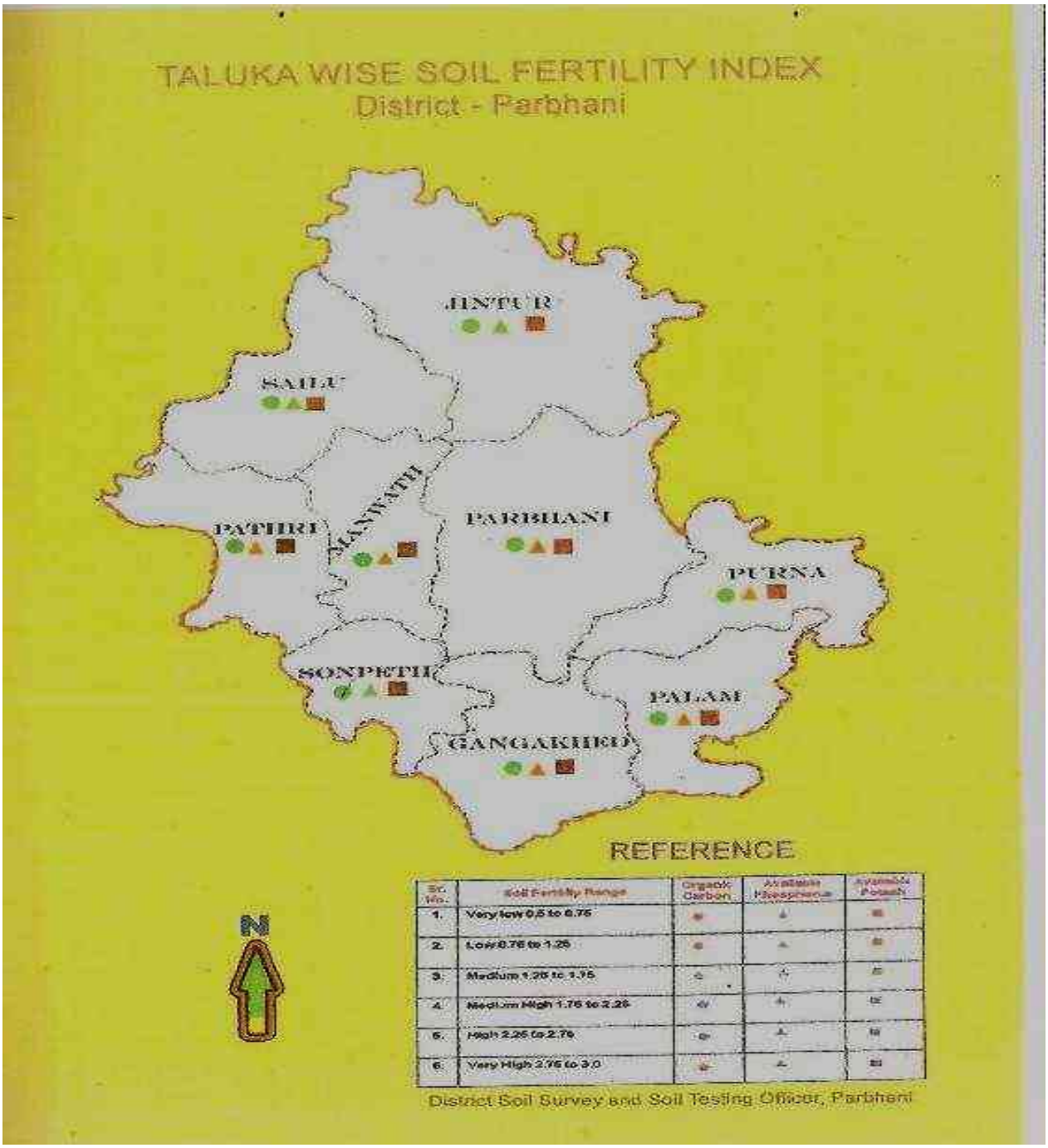
Map 2.3


Map of Showing Resources Position of the distrcit
Railfall and agro climatic region
DISTRICT - PARBHANI
JINTUR
SELU
PARBHANI
PURNA
SONPETH
PALAM
GANGAKHED
N
REFERENCE
AGRO - CLIMATIC ZONES AS PER N.A.R.P.
INDEX
Very High Rainfall zone with laterite Soils.
Very High Rainfall with non-laterite soils
Ghat Zone
Transition Zone - I
Transition Zone - II
Scarcity Zone
Assured Rainfall Zone
Moderate to Moderately High Rainfall Zone
High Rainfall Zone with Soil formed Rocks of Mixed Origin

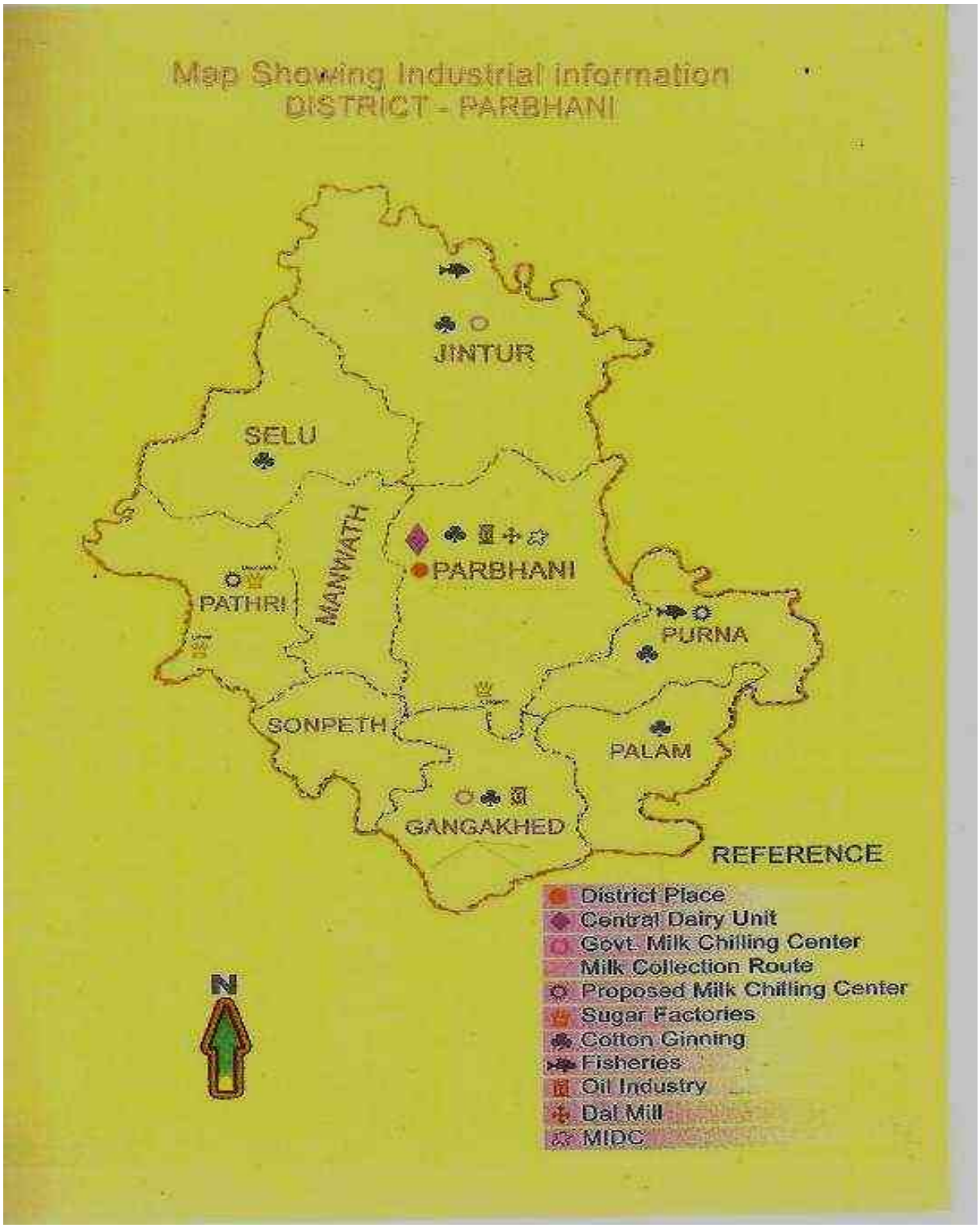
Map 2.4


MAP SHOWING THE CROP REGION OF THE DISTRICT BY AREA AND PRODUCTIVITY CLASSES.
District - Parbhani
JINTUR
SELU
PATHRI
MANWATH
PARBHANI
PURNA
SONPETH
PALAM
GANGAKHED
REFERENCE
Jowar
Cotton
Wheat
Sugar Cane
Pulse Crop
Banana
Orange
Sweet Orange
Soyabean
K. Lime

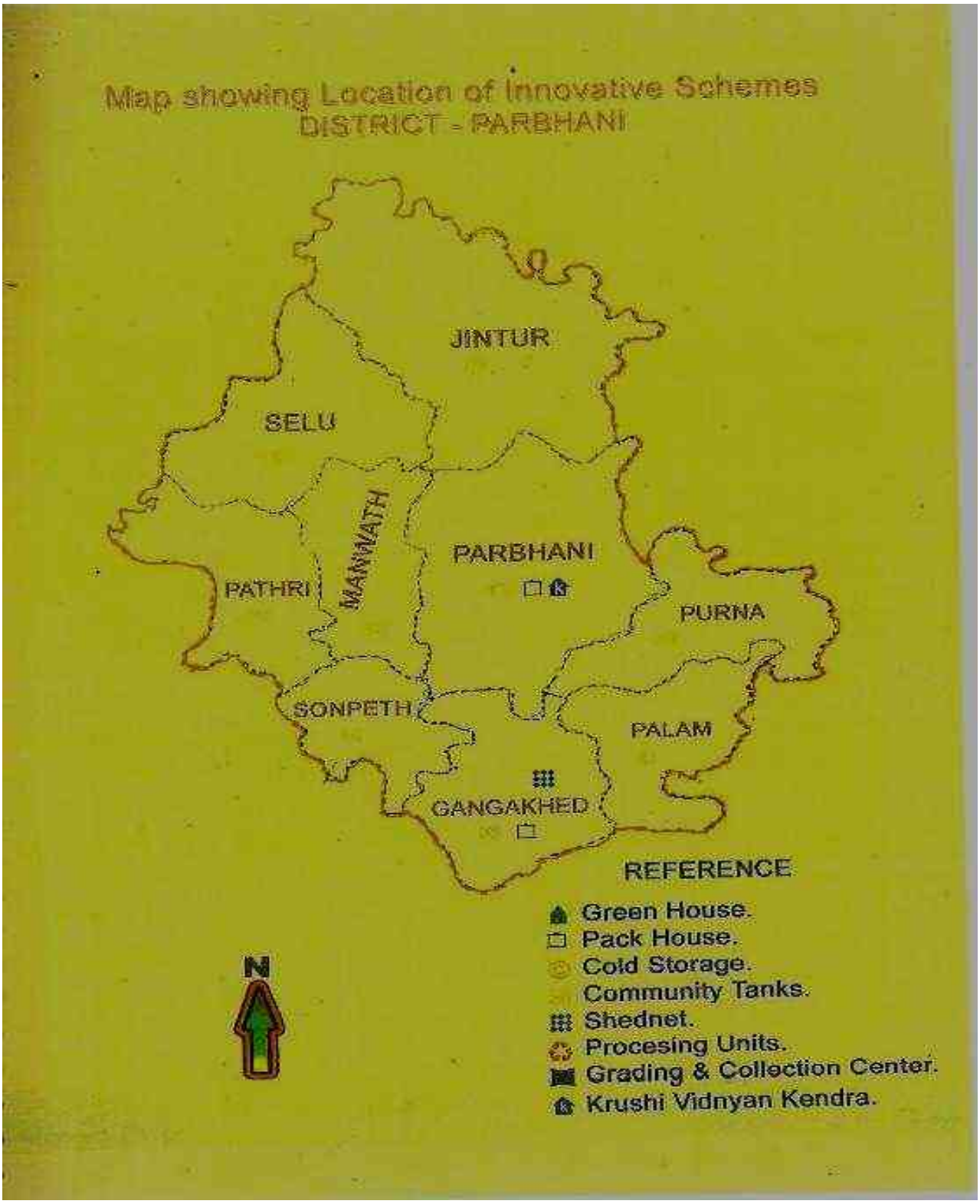
Map 2.5


TALUKA WISE SOIL FERTILITY INDEX
District - Parbhani
JINTUR
SAILU
PATHRI
MANWATH
PARBHANI
PURNA
SONPETH
PALAM
GANGAKHED
REFERENCE
N
Sr. No.
Soil Fertility Range
Organic Carbon
Available Phosphorus
Available Potash
1. Very low 0.5 to 0.75
2. Low 0.76 to 1.25
3. Medium 1.26 to 1.75
4. Medium High 1.76 to 2.25
5. High 2.26 to 2.75
6. Very High 2.76 to 3.0
District Soil Survey and Soil Testing Officer, Parbhani

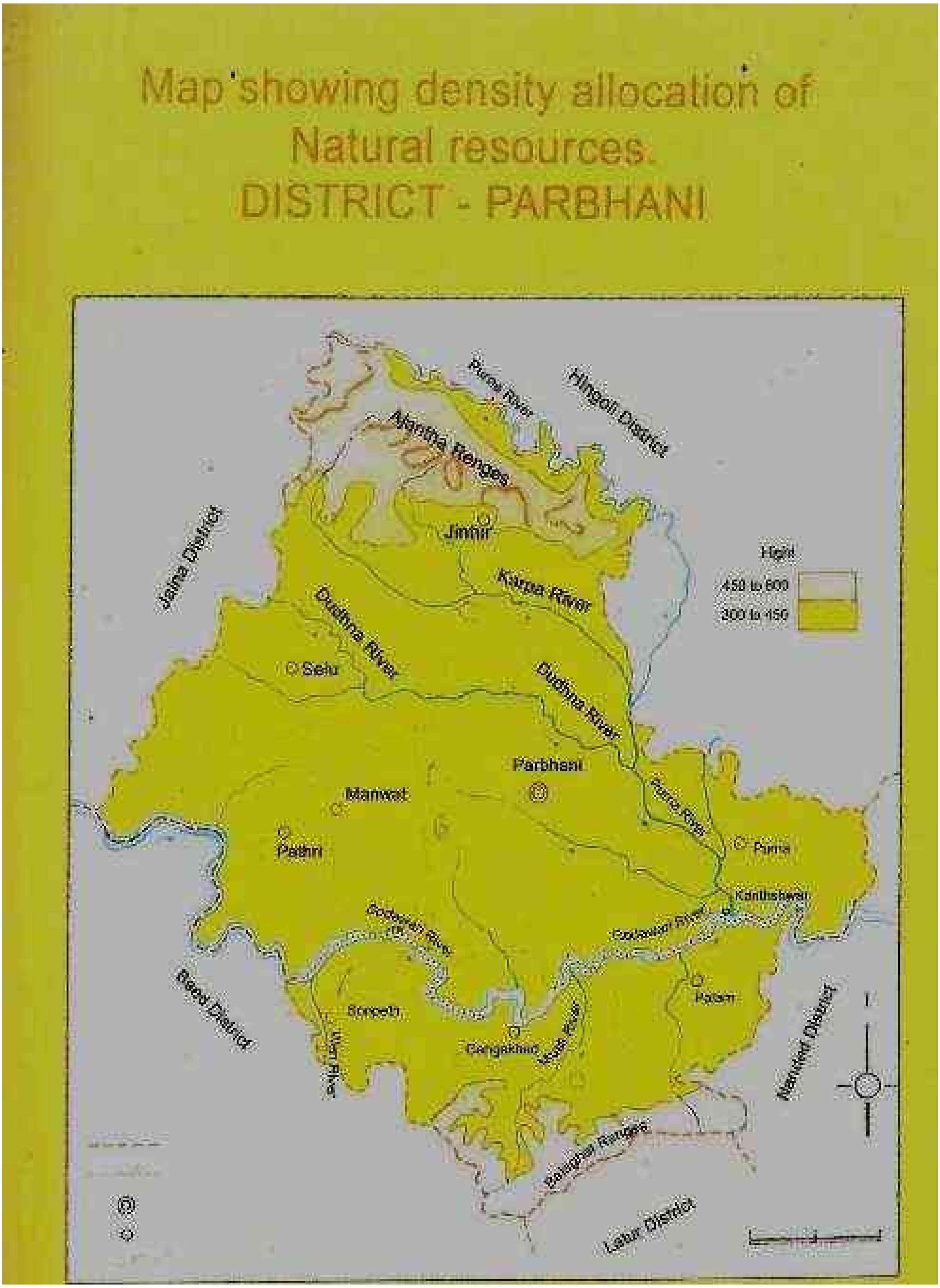
Map 2.6


Map Showing Industrial information
DISTRICT - PARBHANI
JINTUR
SELU
MANWATH
PARBHANI
PATHRI
PURNA
SONPETH
PALAM
GANGAKHED
N
REFERENCE
District Place
Central Dairy Unit
Govt. Milk Chilling Center
Milk Collection Route
Proposed Milk Chilling Center
Sugar Factories
Cotton Ginning
Fisheries
Oil Industry
Dal Mill
MIDC

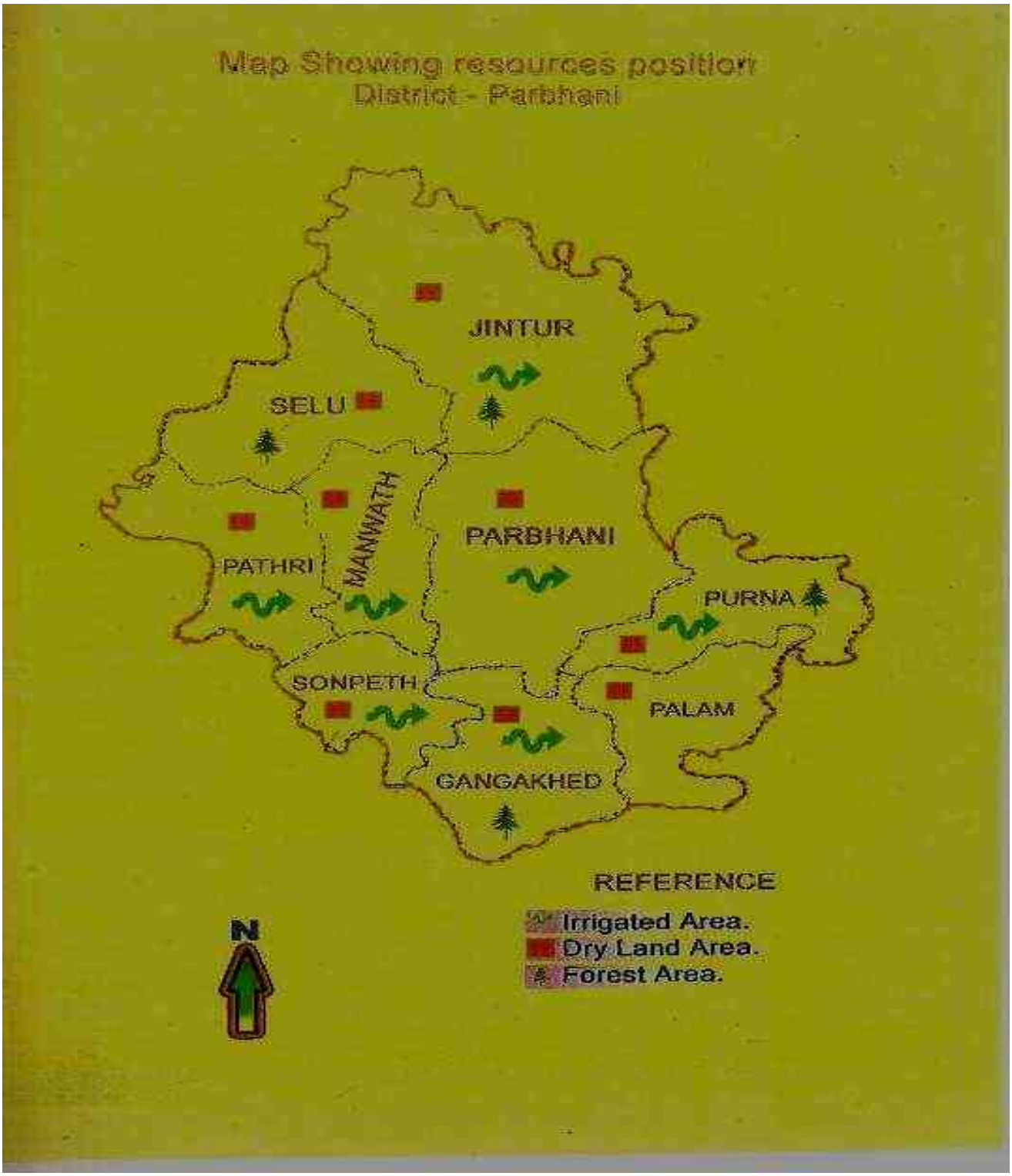
Map 2.7


Map showing Location of Innovative Schemes
DISTRICT - PARBHANI
JINTUR
SELU
MANWATH
PARBHANI
PATHRI
PURNA
SONPETH
PALAM
GANGAKHED
N
REFERENCE
Green House.
Pack House.
Cold Storage.
Community Tanks.
Shednet.
Procesing Units.
Grading & Collection Center.
Krushi Vidnyan Kendra.

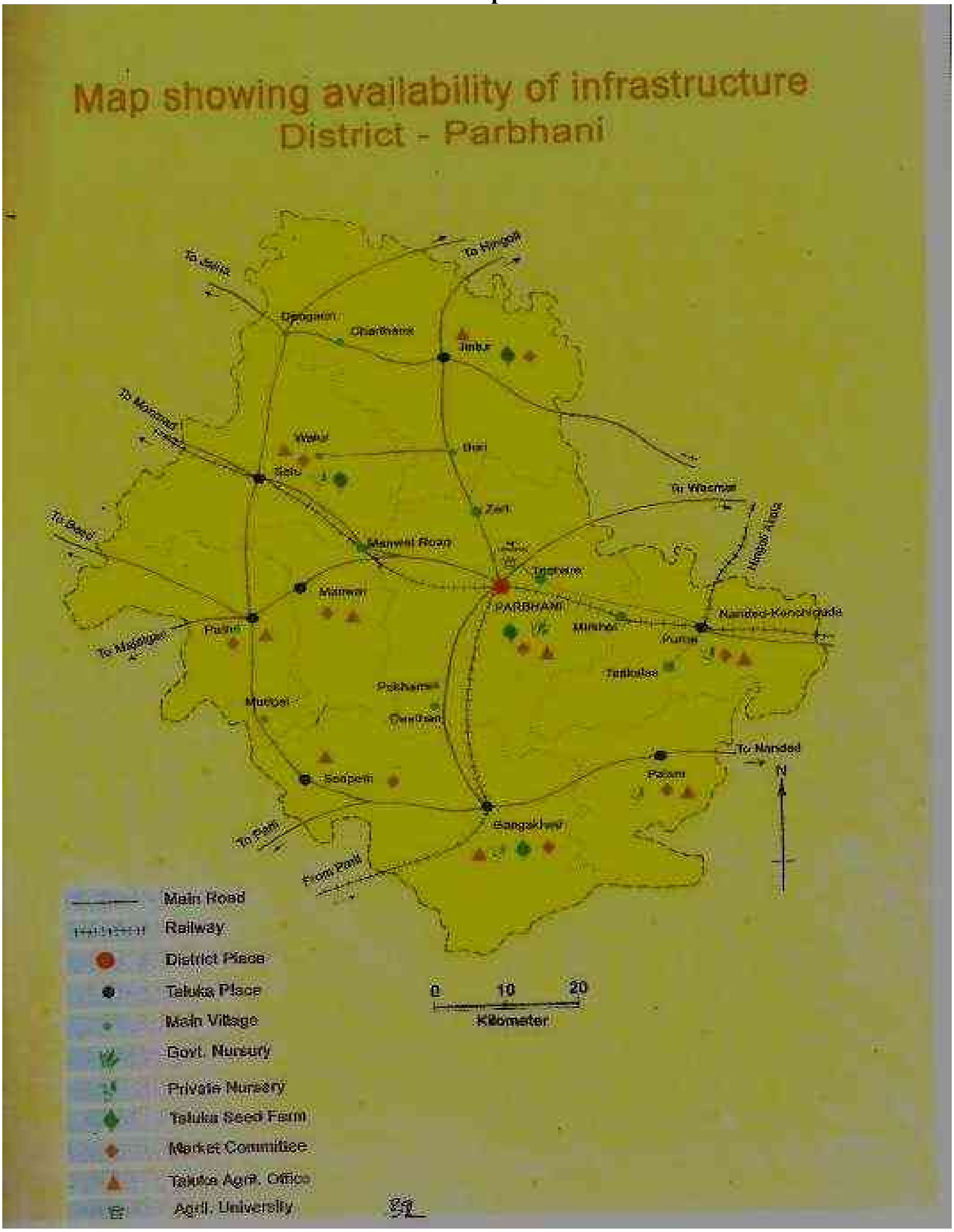
Map 2.8


Map showing density allocation of
Natural resources.
DISTRICT - PARBHANI
Purna River
Hingoli District
Ajantha Renges
Jinthr
Jalna District
Karpa River
Dudhna River
Selu
Dudhna River
Parbhani
Manwat
Pathri
Purna River
Purna
Kanthshwar
Godawari River
Godawari River
Palam
Sonpeth
Gangakhed
Beed District
Nanded District
Balaghat Ranges
Latur District

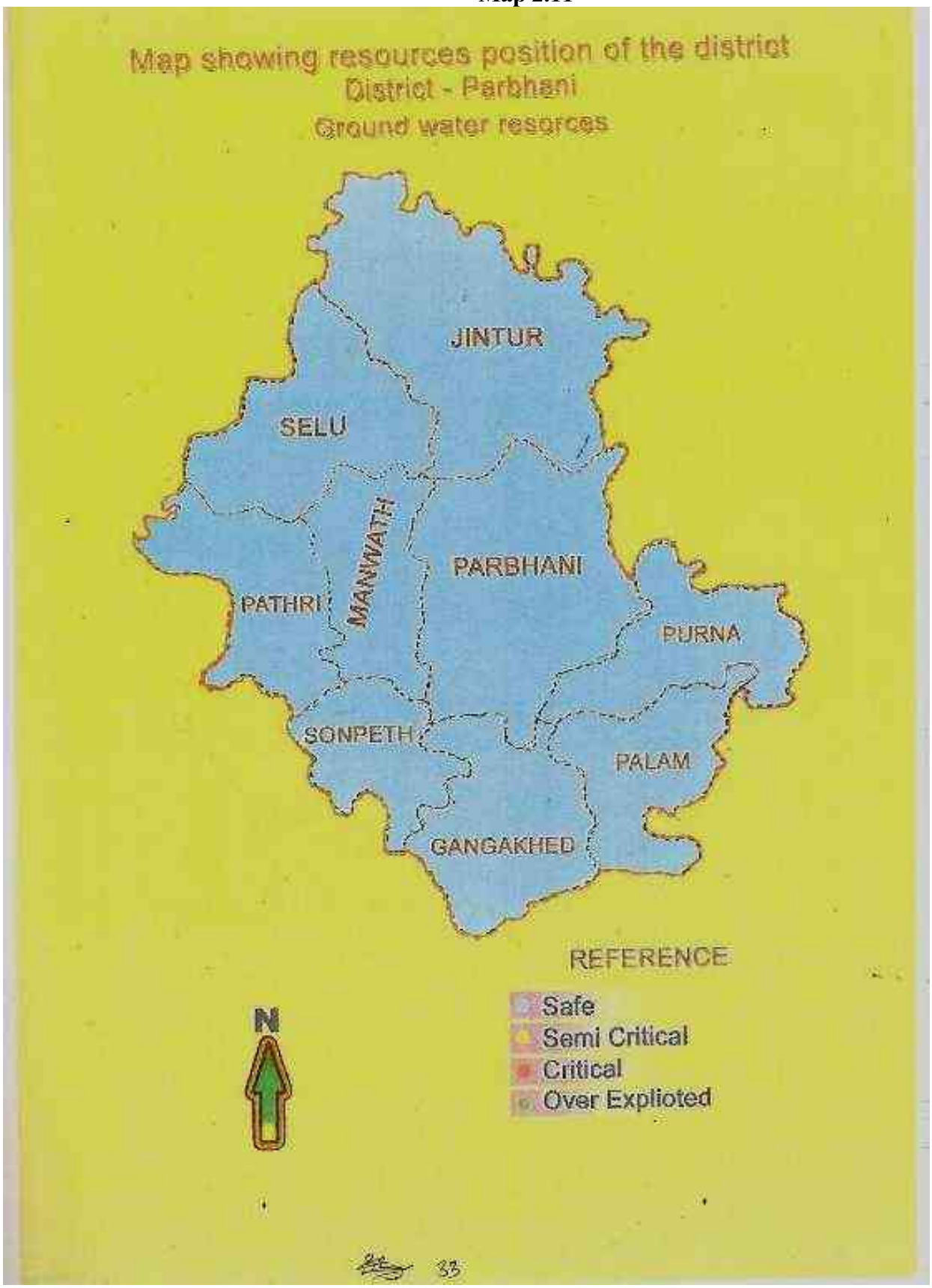
Map 2.9


Map Showing resources position
District - Parbhani
JINTUR
SELU
PARBHANI
MANWATH
PATHRI
PURNA
SONPETH
PALAM
GANGAKHED
REFERENCE
Irrigated Area.
Dry Land Area.
Forest Area.
N

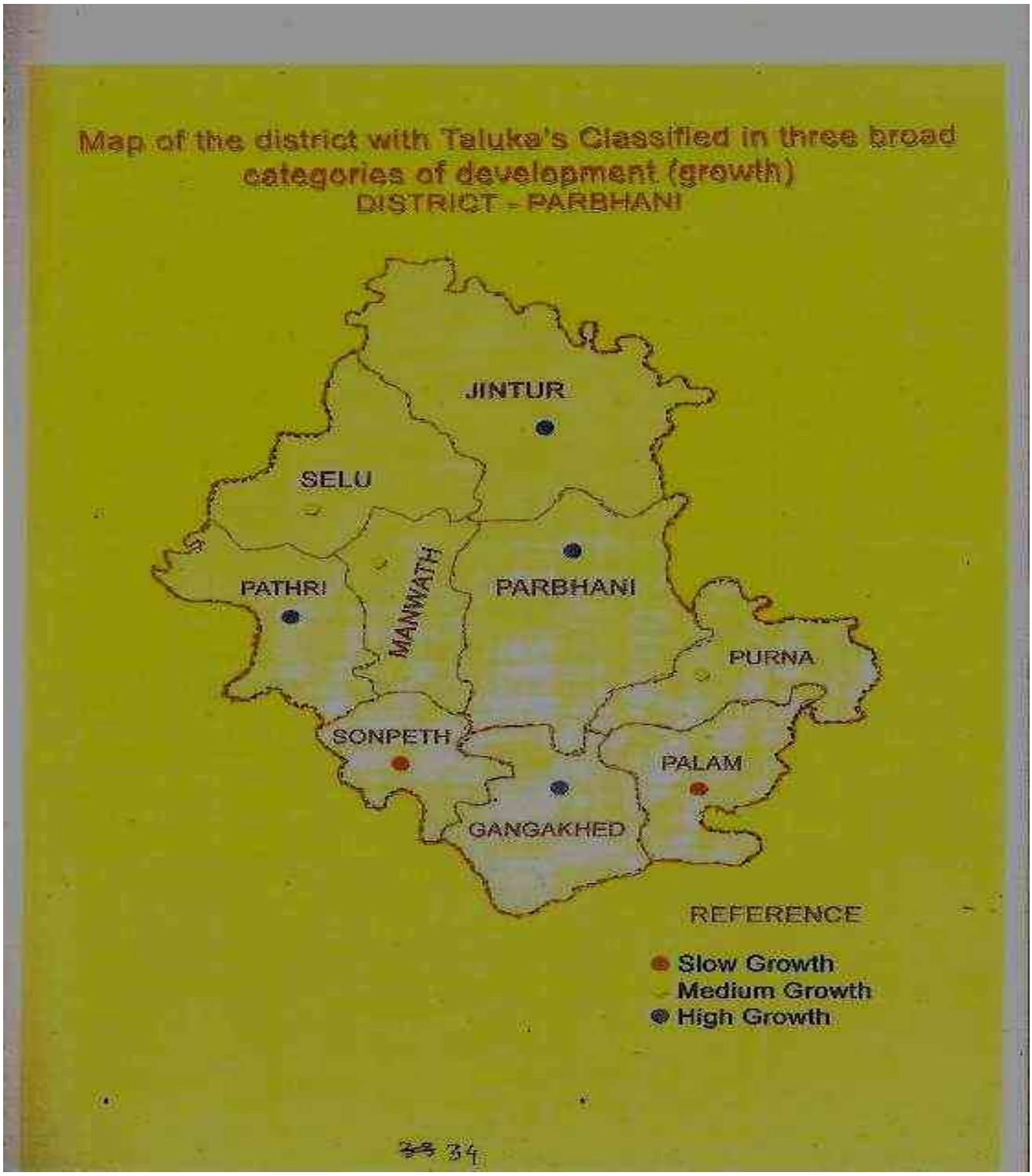
Map 2.10


Map showing availability of infrastructure
District - Parbhani
To Hingoli
To Jalna
Jintur
Selu
Manwat Road
PARBHANI
To Washim
Nanded-Kandhargade
Purna
Manwat
Pathri
To Majalgaon
To Beed
To Nanded
Palam
Sonpeth
Gangakhed
To Parli
From Parli
Main Road
Railway
District Place
Taluka Place
Main Village
Govt. Nursery
Private Nursery
Taluka Seed Farm
Market Committee
Taluka Agri. Office
Agri. University
0 10 20
Kilometer
N

Map 2.11


Map showing resources position of the district
District - Parbhani
Ground water resorces
JINTUR
SELU
MANWATH
PARBHANI
PATHRI
PURNA
SONPETH
PALAM
GANGAKHED
REFERENCE
Safe
Semi Critical
Critical
Over Explioted
N
33

Map 2.12


Map of the district with Taluka's Classified in three broad categories of development (growth)
DISTRICT - PARBHANI
JINTUR
SELU
PATHRI
MANWATH
PARBHANI
PURNA
SONPETH
PALAM
GANGAKHED
REFERENCE
Slow Growth
Medium Growth
High Growth
34

Map 2.13

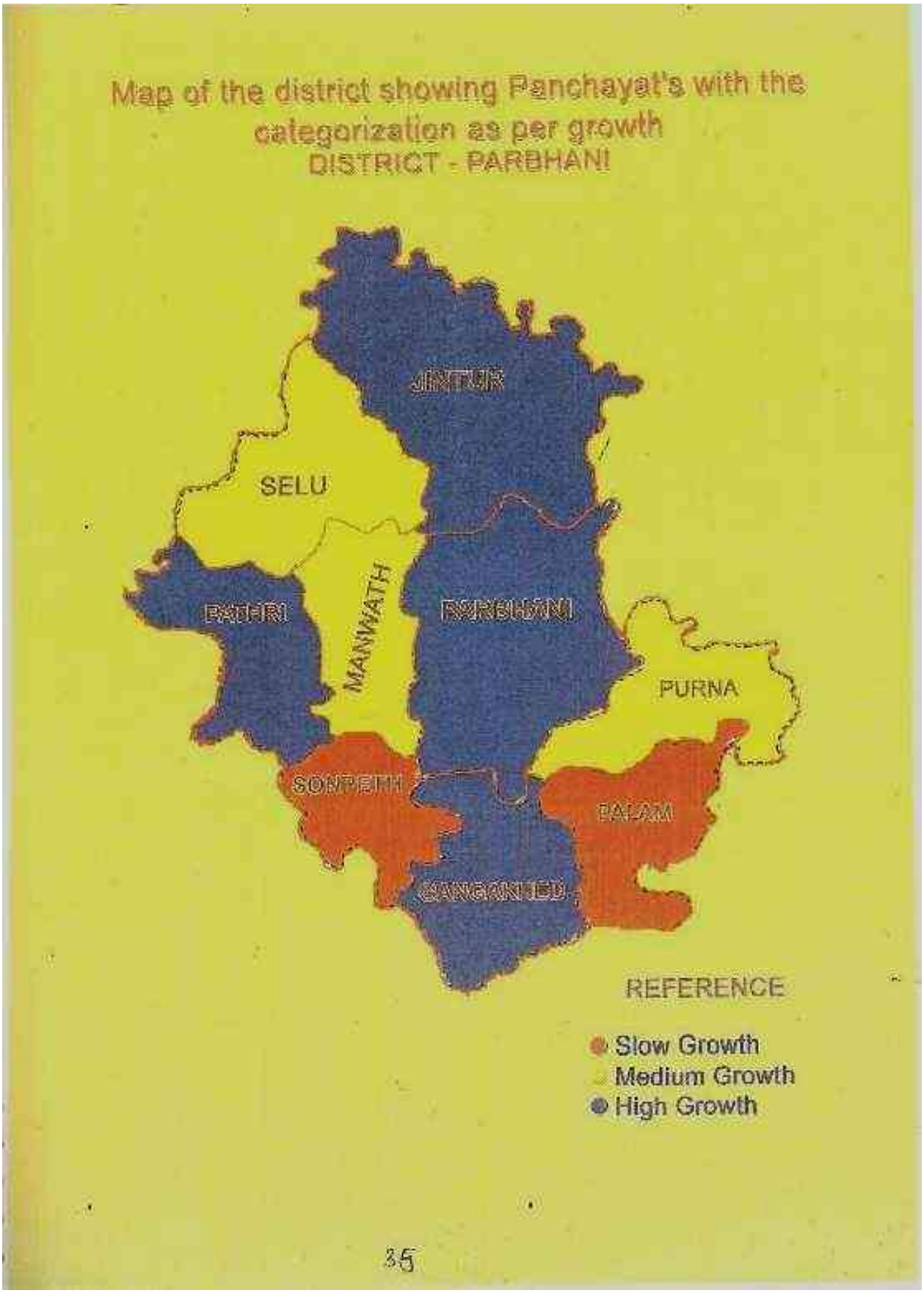

Map of the district showing Panchayat's with the categorization as per growth
DISTRICT - PARBHANI
JINTUR
SELU
PATHRI
MANWATH
PURNA
PALAM
REFERENCE
Slow Growth
Medium Growth
High Growth

TABLE 2.1

General Information **District - Parbhani**

Sr.No.	Taluka	Villages			Population (As per the 2011 Census)				
		No.of Revenue Village	Area in Ha.	No. of G.P.S.	Male	Female	Total	S.C.	S.T.
1	Parbhani	131	125331	117	86633	82541	169174	20156	2031
2	Purna	95	63173	79	144882	137874	282756	31336	15816
3	Palam	82	50884	67	275285	262525	537810	69316	7348
4	Gangakhed	106	51981	84	59745	57072	116817	15060	1427
5	Sonpeth	60	35623	42	71482	67564	139046	20387	1634
6	Pathri	58	54029	49	46250	43332	89582	13032	1005
7	Manvat	54	42917	49	104857	98010	202867	29627	4333
8	Selu	94	81455	82	59737	55645	115382	15862	4335
9	Jintur	168	125722	135	93999	88653	182652	32532	2585
	Total	848	631115	704	942870	893216	1836086	247308	40514

II DEMOGRAPHIC PROFILE:

a) **Population:** According to the Census Report 2011, the total population of Parbhani district is 18.36 lakhs; of which males are 9.42 lakhs while female population is 8.94 lakhs. The sex ratio of the district is observed to be 947 females per thousand, males as against the state average of 922 females per 1000 males.

b) **Urban – Rural:** The rural population of Parbhani district is 12.48 lakhs (or 67.9%) indicating a dominance of rural sector; the urban population is 5.88 lakhs (or 32.1 %) of total population of the district; at the state level the urban population forms about 42% of total population.

c) **SC/ST Population:** The Scheduled Casts (SC) population of the district is found to be 2.47 lakhs or 12.45% of the total population of the district; while the total population of Scheduled Tribes (ST) is observed to be 0.40 lakhs or 2.3% of the total population of the district.

d) Density of Population: The density of population per sq. km. of area in Parbhani district is quite low at 192 persons as against the State average of 315 persons.(Please see Table 2.1)

Table – 2.2
Demographic Profile of Parbhani District (2001)

Sr. No.	Item	Number(lakhs)
1	Total Population	18.36
2	…of which Males	9.42
3	…of which Females	8.93
4	Sex ratio (Per 100 males)	947
5	Rural Population	12.48 (67.9)
6	Urban Population	5.88 (32.1)
7	SC Population % to total Population	2.47 (13.45%)
8	ST Population % to total Population	0.40 (2.17%)
9	Density of Population	192

Source: Socio-Economic Review of Parbhani District 2011

LAND USE PATTERN IN PARBHANI DISTRICT:

The economy of Parbhani District is mainly dependent on agriculture as about 60% of the workforce is engaged in agriculture. The district has a geographical area of 6.51 lakh ha, of which 86% is available for cultivation. Following are some important characteristics of land utilization pattern in the district:-

1. Forest area in the district is less than 1%. It is 0.99% to the total geographical area.
2. Land Area which is not available for cultivation is 5.46%. It means the land used for agriculture activity is high.
3. Jintur Block in the district possess highest geographical area (1,25,722 Ha.). But, the area under fallow land and uncultivated land is also large in the block.

4. An area of fallow land is 4.62% to total geographical area of the district. Uncultivated area in the district is 5.46% and it is concentrated in Jintur Block. It has 12,900 Ha. uncultivated land..
5. The cropping intensity of the district is 163%, which is comparatively less. The total land area available for cultivation is 90% to total geographical area but actually cultivated area is less than the availability. This shows the under utilization of land.

Table 2.3

Land Use Pattern in Parbhani District (2011 – 2012)

Taluka	Geographical Area (Ha.)	Forest Area (Ha.)	Area not available for cultivation (Ha.)	Uncultivated land (Ha)	Fallow land (current & other)	Total cultivable Area
Parbhani	1,25,331	0	3247	1838	3160	1,21,576
Jintur	1,25,722	6257	12,900	10,896	13,799	1,03,359
Gangakhed	87,604	0	5155	7083	1630	75,981
Pathri	96,946	0	4092	3750	2788	91,984
Purna	63,173	22	4386	167	3025	58,653
Palam	50,884	0	6433	3200	2444	43,401
Selu	81,455	27	3282	10,442	2317	77,804
District Total	6,31,115 (100%)	6306 *(0.99)	34,495 *(5.46)	37,376 *(5.92)	29,163 *(4.62)	5,72,758 *(90.75)

Source: District Socio-economic abstract, Parbhani 2011 – 12
A) Figures in brackets shows % to total
b) Cropping intensity – 163%

Land Capability Classification:

As reported by agriculture department, the data on land capability classes (Table 2.4) indicate that 2.5 lakh ha. of land falls under class I. This means that there is a great scope to increase growth rate because these are productive soils. Class II and III land occupy nearly 1.9 lakh ha. This land has a few limitation for the productivity land they can be productive if properly managed. Lands susptible to erosion is scanty.

Soil Fertility:

The data on PHc EC and available N, P, K in table 5 indicate that these are nv acidic soil, in the district. Most of the sample show that there is neutral reaction while salinity hazard is limited. Soil have low to medium level of organic carbon while there is no status given of available P. The soils have of high level potash. As regards the micro nutrients the soils are sufficient in available Cu Fe and Mn. As regards the available zinc there is sufficiency at 60% locations while 40% samples have deficiency this indicates the need of integrated nutrient management.

Saline and Alkali Soil:

Small area 419 ha. affected by salts. This needs reclamation. The area should be diagonised separately for salinity and alkalinity as the treatments for reclamation are different.

Table No.2.4
Land Capability classification

Area in (ha.)

S.No	Taluka	Very good cultivable land Class-1	Good Cultivable land Class-ll	Moderately Good cultivable land Class-111	Fairly good land, suited for occasional cultivation Class-IV	Nearly levelland not suitable for cultivation because of stoniness,wetness,et c. Class-V	Steep slopes, highly erosion prone with shallow soils Class-VI	Steep slopes with severe soil erosion relulting in eroded stony and rough soil surfaces with shallow soil depth Class-VI!
1	Parbhani	99468	12888	2233	2160	—	337	-
2	Purna	43987	6476	1554	3556			-
3	Palam	1296	19765	6552	8770	—	2424	-
4	Gangakhed	30981	13281	6743	14073	—	8658	-
5	Sonpeth	0						-
6	Selu	4257	44570	8964	6911	—	685	-
7	Pathri	27429	29071	14173	15455	—	188	-
8	Manvat	0						-
9	Jintur	47615	17440	5453	7434	—	3928	-
	Total	**255033**	**143491**	**45672**	**58359**		**16220**	-

Table No.2.5
Soil Firti Indic

Sr. No	Taluka	No. of Soil Samples Analysed	pH			EC (ds/m)			Organic carbon (%)			Available Nitrogen (kg/ha)			Available Palash (kg/ha)			Available Potash (kg/ha)		
			Acidic	Neutral	Alkaline	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Parbhani	4205		4196	9	4093	112	---	1102	2413	690	1283	2922	---	62	234	3909	---	---	21025
2	Purna	1876		1872	4	1821	55	---	429	1044	403	526	1350	---	21	67	1768	---	---	9380
3	Palam	1344		1343	1	1309	35	---	307	787	250	308	1036	---	12	49	1283	---	---	6720
4	Gangakhed	2150		2134	16	2117	33	---	499	1275	376	774	1376	---	43	188	1919	---	---	10750
5	Sonpeth	581		580	1	576	5	---	131	337	113	169	412	---	3	36	542	---	---	2905
6	Selu	2006		1998	8	1986	20	---	571	1161	274	590	1416	---	10	51	1945	---	---	10030
7	Pathri	1255		1247	8	1196	59	---	309	797	149	447	808	---	36	39	1181	---	---	6275
8	Manvat	1169		1167	2	1152	17	---	289	681	199	335	834	---	68	81	1020	---	---	5845
9	Jintur	2314		2304	10	2284	30	---	636	1305	373	740	1574	---	81	160	2073	---	---	11570
	Total	16900		16841	59	16534	366	---	4273	9800	2927	5172	11728	---	336	924	15640	---	---	84500

Table No. 2.6
Micro Nutrient Status

Sr. No.	Taluka	No. of Soil Samples Analysed	Copper (Cu)		Iron (Fe)		Manganese (Mn)		Zinc (Zn)	
			Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient	Sufficient	Deficient
1	Parbhani	1991	1991	0	1836	155	1861	130	1088	903
2	Purna	1241	1241	0	1113	128	1144	97	711	530
3	Palam	668	668	0	610	58	617	51	377	291
4	Gangakhed	913	913	0	829	84	844	69	552	361
5	Sonpeth	292	292	0	272	20	265	27	163	129
6	Selu	542	542	0	505	37	493	49	289	253
7	Pathri	372	372	0	327	45	333	39	193	179
8	Manvat	607	607	0	543	64	546	61	370	237
9	Jintur	896	896	0	835	61	858	38	490	406
	Total	7522	7522	0	6870	652	6961	561	4233	3289

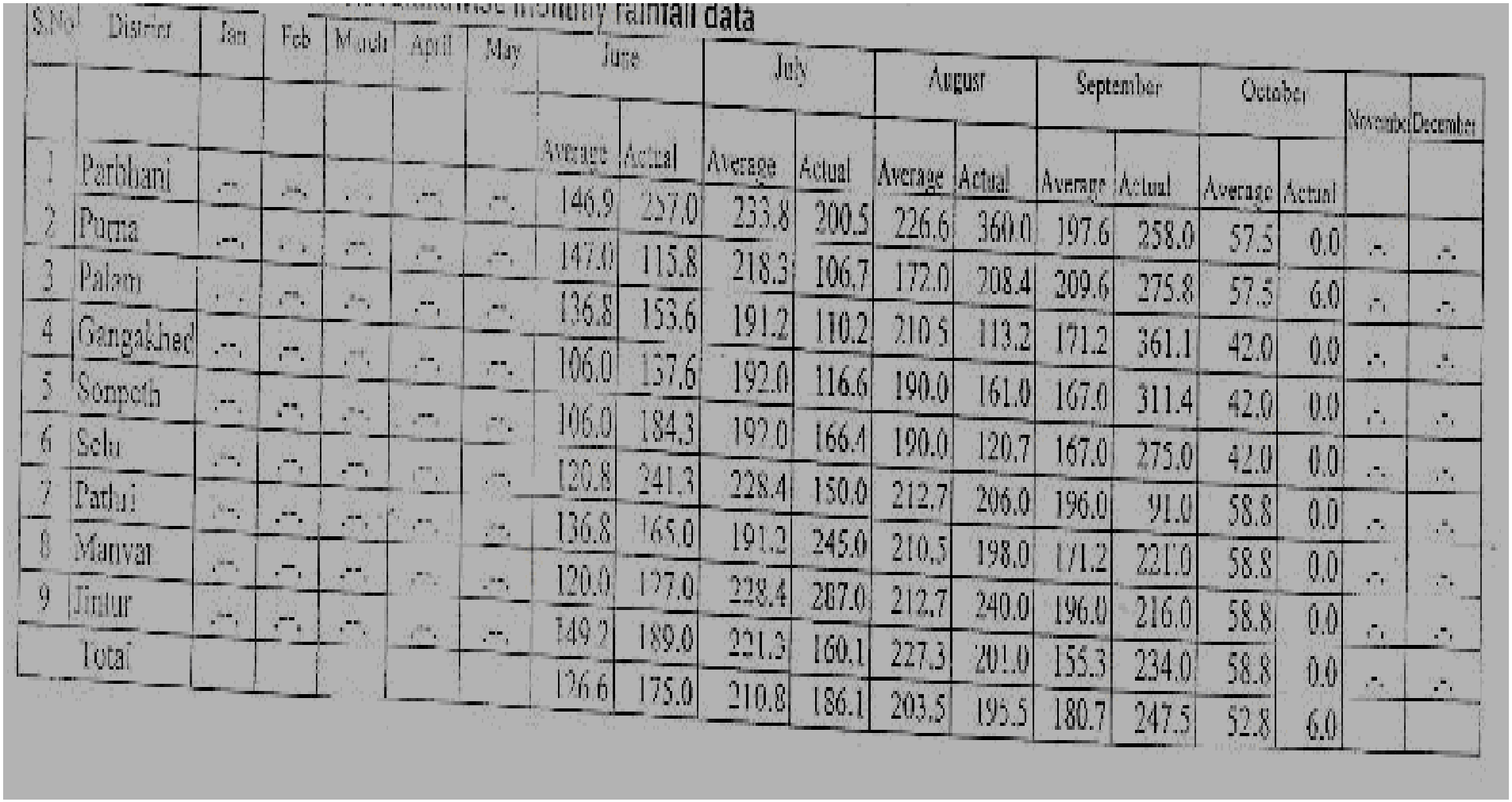
Table No. 2.7
Reclamation and Development of Saline / Alkali Soils

S. No.	Taluka	Area under Saline / Alkali Soil	Area treated (ha) upto 2006-07	Balance Area (ha)
1	Parbhani	39 Ha	---	39 Ha
2	Purna		---	
3	Palam		---	
4	Gangakhed	13 Ha	---	13 Ha
5	Sonpeth		---	
6	Selu		---	
7	Pathri	355 Ha	---	355 Ha
8	Manvat	12 Ha	---	12 Ha
9	Jintur		---	
	Total	**419 Ha**	---	**419 Ha**

Table No. 2.8
Data on Weather (Available normals) 2007-08

S.No		Rainfall		Temperature		Humidity	
	District	No. of Rainy days	Average rainfall (mm)	Min °c	Max°c	Min	Max
1	Parbhani	45	862.40	11	36	34	65
2	Purna	35	804.40	11	36	34	65
3	Palam	45	697,00	12	34	29	59
4	Gangakhed	43	697.00	12	34.	29	59
5	Sonpeth	48	697.00	12	32	31	66
6	Selu	44	816.70	13	31	28	65
7	Pathri	34	768.50	13	31	28	65
8	Manvat	48	816.70	13	31	29	58
9	Jintur	55	811.10	14	32'	25	54
	Total	**397**	**774.40**	**12**	**33**	**30**	**62**

Table No. 2.9
Block/Talukawise monthly rainfall data



Block/Talukawise monthly rainfall data

S.No	District	Jan	Feb	March	April	May	June		July		August		September		October		November	December
							Average	Actual	Average	Actual	Average	Actual	Average	Actual	Average	Actual		
1	Parbhani	--	--	--	--	--	146.9	257.0	233.8	200.5	226.6	360.0	197.6	258.0	57.5	0.0	--	--
2	Purna	--	--	--	--	--	147.0	115.8	218.3	106.7	172.0	208.4	209.6	275.8	57.5	6.0	--	--
3	Palam	--	--	--	--	--	136.8	153.6	191.2	110.2	210.5	113.2	171.2	361.1	42.0	0.0	--	--
4	Gangakhed	--	--	--	--	--	106.0	137.6	192.0	116.6	190.0	161.0	167.0	311.4	42.0	0.0	--	--
5	Sonpeth	--	--	--	--	--	106.0	184.3	192.0	166.4	190.0	120.7	167.0	275.0	42.0	0.0	--	--
6	Selu	--	--	--	--	--	120.8	241.3	228.4	150.0	212.7	206.0	196.0	91.0	58.8	0.0	--	--
7	Pathri	--	--	--	--	--	136.8	165.0	191.2	245.0	210.5	198.0	171.2	221.0	58.8	0.0	--	--
8	Manvat	--	--	--	--	--	120.0	197.0	228.4	287.0	212.7	240.0	196.0	216.0	58.8	0.0	--	--
9	Jintur	--	--	--	--	--	149.2	189.0	221.3	160.1	227.3	201.0	155.3	234.0	58.8	0.0	--	--
	Total						176.6	175.0	210.8	186.1	203.5	195.5	180.7	247.5	52.8	6.0		

Command of Jaikwadi, Purna and lower Dudhana irrigation projects lies in this District. The total area irrigated in of the order of 217048. Major portion of this area of the order of 167135 is contributed by the above mentioned two major projects. Present utilization of grand water from open and tube wells of only of the order of 49913 ha there is adequate scope of use of available ground water by digging more than one lakh additional wells.

Table No. 2.10
Source wise Area Irrigated

Sr. No	Taluka	Nos.	Tanks	Open Wells		Tube/Bore wells		Lift irrigation		Other sources		Total	
			Area	Nos.	Area	Nos.	Area	Nos.	Area	Nos.	Area	Nos.	Area
1	Parbhani		35163	4175	12141			0	0				4730
2	Purna		34089	3015	2760			2	969				3780
3	Palam		873	574	6549			0	0				7422
4	Gangakhed		19877	1320	3519			3	928				24328
5	Sonpeth		19900	108	619			0	0				20519
6	Selu		434	1442	4545				0				4979
7	Pathri		30118	3637	5445			4	759				36326
8	Manvat		11660	1452	3186			0	0				14846
9	Jintur		11377	6980	5369				988				17727
	Total	130	163491	22703	44133	4975	5780	12	3644	0		27820	217048

Table No. 2.11
Analysis Report – Period – 2008 – 09 to 2013 - 14

Sr. No.	Name of the Taluka	No. of Water Samples analysed	Permissible C-1	Moderately Safe C-2	Moderately unsafe C-3	Unsafe C-4
1	2	3	4	5	6	7
1	Parbhani	716	6	260	415	35
2	Purna	287	1	121	162	3
3	Palam	491	3	232	247	9
4	Gangakhed	347	3	174	165	5
5	Sonpeth	94	4	40	46	4
6	Selu	219	4	112	95	8
7	Pathri	110		40	53	17
8	Manvat	307	2	127	163	15
9	Jintur	336	5	198	127	6
	Total	**2907**	**28**	**1304**	1473	102

MAIN AND MARGINAL WORKERS: EMPLOYMENT, UNEMPLOYMENT IN PARBHANI DISTRICT:

INTRODUCTION:

Achievement of full employment is one of the major objectives of the economic policy of any Government. There are other objectives of economic policy like price stability and high economic growth. Our 12th five year plan aims at 9% growth rate of the Gross Domestic product, during the period, 2012 -20017. To create higher level of employment a high growth rate of GDP is an important precondition.

Another important objective of our 12th plan is to create more jobs in the non – farm sector of the economy. Today in an industrially advanced state like Maharashtra, the share of Agriculture or primary sector in the state Domestic product has come down to 13% only. This is no doubt, an indicator of a progressive economy; but at the same time the burden of population and labour force should have been reduced by the same proportion. But this process has not taken place at the All India level or the state level. In Maharashtra, 58% of the total population of the state depends on agriculture and allied activities for its livelihood. In Parbhani district, the share of Agriculture to total District Domestic product of Parbhani district is as high as 26 % while the proportion of population depending on it is 68 %. Hence, there is a need to shift population to non-farm sector, manufacturing and services sector.

Therefore, in this chapter we have discussed the position of employment, unemployment as well as the present position of industrial or non-farm development in Parbhani district.

Table – 2.12
Main and Marginal workers:

	Main Workers	Total		
1	Cultivators……	281771		
2	Agriculture Labourers …….	288438		
3	Manufacturing, repairs, ……. Services and household industry.	10939		
4	Other workers……..	175269		
5	Total Main workers	756417		
	MARGINAL WORKERS			
6	Cultivators……	13259		
7	Agriculture Labors …..	29368		
8	Manufacturing, repairs… Service, household industry	2271		
9	Other workers ….	21482		
10	Total Marginal Workers…..	66380		
	CLASSIFICATION OF WORKERS			
11	Total workers ….	822797 (100%)		
12	Proportion of workers to total population of dist ….	44.77%		
13	Total non-workers ….	1013289		
14	Proportion of non – workers to total population of district….	55.18		
15	Total population of district …	1836086		

Source: Socio- economic Review of Parbhani Dist. 2011 - 12

MAIN AND MARGINAL WORKERS IN PARBHANI DISTRICT (2011)

Table 2.13 shows the data relating to the Main and Marginal Workers in Parbhani dist. in 2011.

1) WORKING AND NON-WORKING POPULATION:

In 2011, the total population of Parbhani dist. Was 18.36 lakhs; of which 44.77% or 8.2 lakhs was working population in various sectors of the economy. The remaining 55% or 10.13 lakhs, was non-working or dependent population. It may be observed from the table that in rural areas the proportion of workers to total rural population is much higher at 48.81%. In other words the non-working population in urban areas is very high at 72.90%

2) MAIN AND MARGINAL WORKERS:

The total no. of workers in Parbhani dist. in 2011 was 822797; of which 756417 workers were Main workers, while 66380 workers were classified as Marginal workers.

3) CULTIVATORS AND AGRICULTURAL WORKERS:

There were 281771 main Cultivator and 13259 marginal cultivators in Parbhani district, or a total of 295030 Cultivators. They formed about 35.86% of total workers. In this way a total number of 308289 cultivators plus agricultural workers are dependent on primary sector of the district economy. (or 75%). Policies have to be framed to shift this labour force from agriculture to non – farm sector

4) MANUFACTURING, HOUSEHOLD INDUSTRY AND REPAIRS, SERVICES:

There are 10939 main workers and 2271 marginal workers employed in manufacturing sector making a total of 13210 workers. This forms hardly 1.60 % of total workers in the district in 2001. This clearly indicates a very weak industrial base of the district economy. Hence there is need to expand the industrial sector of the district economy.

5) OTHER WORKERS:

This category of workers mainly belongs to the personal and services sector. In this sector there are a total no. of 175269 main and 21482 marginal workers, making a total of 196751 workers, forming about 23.9 % total workers.

It has to be noted that the marginal workers in the district are not fully employed. Most of them are under employed and are in the category of disguisedly unemployed (or their marginal productivity is zero.) Hence there is a problem of providing them with full time jobs in non-farm sector.

EXTENT OF UNEMPLOYMENT IN PARBHANI DISTRICT: (2011 - 12)

The Employment Exchanges at the district level play an important role in registering the names of the job-seekers in the district. They also play the role of providing guidance and job opportunities in the district. Table 2.14 gives information relating to the position of unemployment in Parbhani district for the year 2005-06.

There were 636 vacant positions in the district in 2011 - 12; 93 employers made use of the Employment Guidance Centre, to notify these jobs. The total member of unemployed on live register of the Employment Exchange till end of 2004-05, was quite huge at 66819. Another 10126 job-seekers registered their names at the Employment exchange during the current year.

Table 2.13

Data relating to employment / unemployment Registered with Employment, Self Employment Guidance Centre, Parbhani Dist: 2011- 12

Sr.no.	Particulars	Number
1	Number of vacant jobs declared	502
2	Number of employers making use of Employment Guidance Centre	47
3	Total number of unemployed on live register (till last year)	42522
4	Number of new candidates registered during current year	10302
5	The number of Candidates obtaining jobs	21
6	Number of unemployed at the end of year	44773

Source: Socio- economic Review, Parbhani district 2011- 12, GOM

Table – 2.14

Pattern of Land holding and Land operated in Parbhani District 1991:
(Parbhani / Hingoli combined)

Sr. no.	Size class of land holding	Total No. of cultivators	%of land holders	Total land operated	% to total land operated
1	0-1	132349	38.10	76862.69	14.24
2	1-2	129678	37.33	183270.66	33.97
3	2-4	76530	22.03	218240.13	40.45
4	4-10	8212	2.30	52219.48	9.68
5	10-20	547	0.16	6663.55	1.23
6	20- above	57	0.02	2331.65	0.43
	Total	**347373**	**100.00**	**539588.16**	**100**

Source: District Socio-economic review of Hingoli and Parbhani District GOM.

1) There are a total no. of 347373 land holders in Parbhani district in 2011, operating a total land of 539588.16 hectares. Hence, the average land holding per cultivator comes to about 1.56 hectares, as against the State average of 1.66 ha. per cultivator.

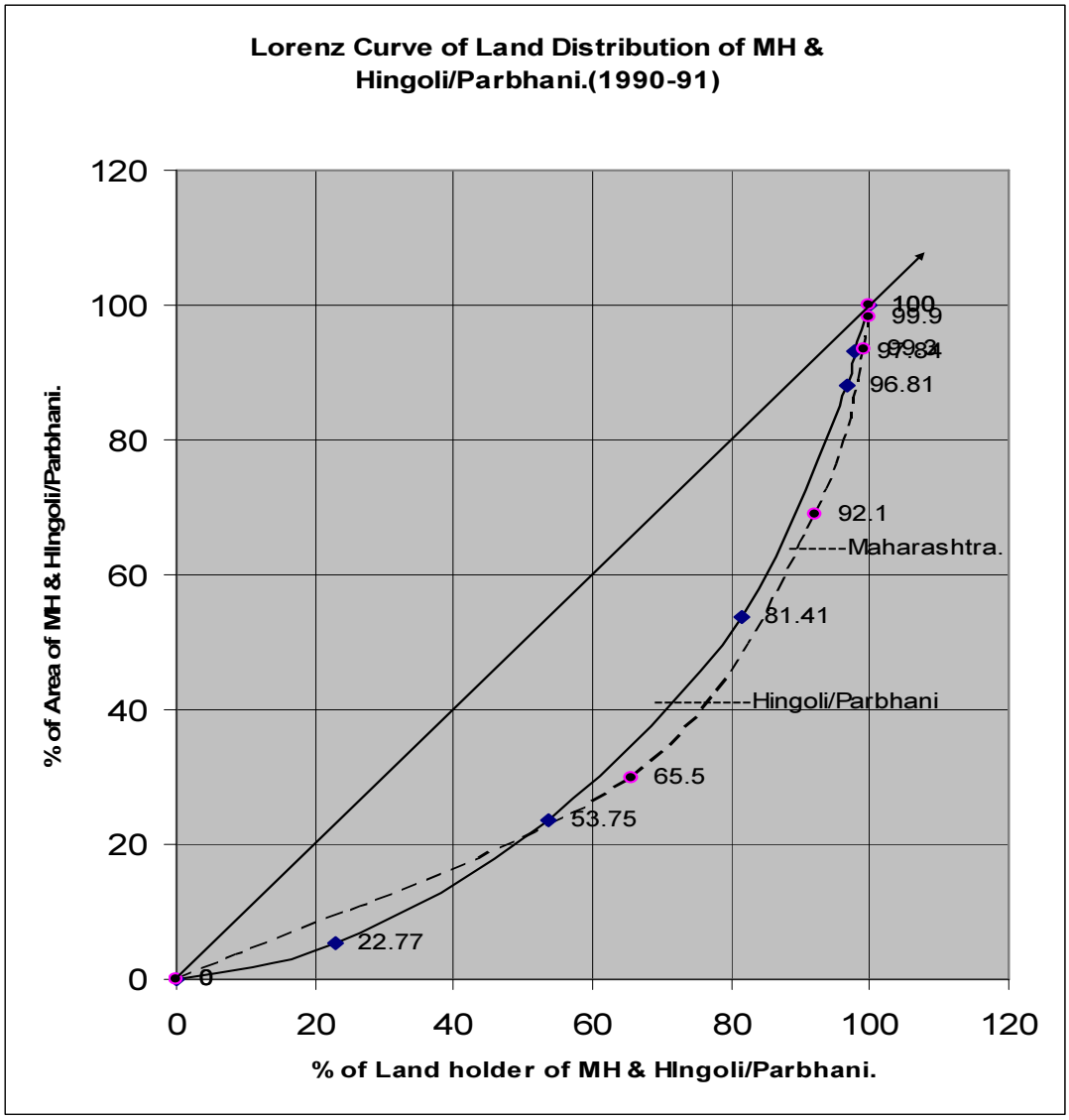
2) Small and Marginal Farmers:

There are a total no. of 132349 cultivators in Parbhani district owning less than one hectare of land; their percentage to total land holders comes to 38.10; while they operated bravely 14.24 % of total land operated in the district.

The total no. of small farmers (1 to 2 ha) in Parbhani district was 129678, or 37.33 % of the total no. of cultivators; while they operated 33.97 % of total land operated in the district.

Diagram 2.1

Lorenz Curve of Land Distribution of MH & Parbhani District



The proportion of small and marginal farmers together in the district formed 54.8% of total farmers, while they together operated 23.6% of total land operated.

3)Land holders owning land between 2 ha-4 ha formed 27.7 % of total while they operated 30.2% of total land.

Similarly, cultivator owning land between 4 ha – 10 ha was 15.5%, but they operated 34.2% of total land. Cultivators owning land between 10 to 20 ha. was 1% but they operated 5% of total land. The big farmers group formed, 1% of total but they operated 7% of land. This clearly indicates that the distribution of land in the district is skewd in –equality of land distribution in Parbhani district; which is depicted the Lorenz curve diagram 2.1.

The average land holding of the marginal farmers is only 0.6 hectares; while that of small farmers group is 1.47 hectares. On the other hand the large farmers' average land holding is quite large at 15.54 hectares per cultivators.

GROSS DISTRICT DOMESTIC PRODUCT OF PARBHANI DISTRICT:-

Our 11th five year plan aims at 9% growth rate of the Gross Domestic Product, during 2007-2012. To create high level of employment a high growth rate of GDP in an important pre-condition.

The share of Primary sector in total district income was 25.36% in 2005-06; while at the State level, the contribution of the primary sector to State Domestic Product in 2005-06, was 14.2%.

The contribution of the secondary sector, in 2005-06, was only 13% indicating a weak and relatively declining position of industrial sector. During the year 2005-06, the contribution of secondary sector to state income was 26.5%.

The contribution of the tertiary sector to the District Domestic product in Parbhani district was 61.6% while at the State level it was 59.3%.

District's per capita income of Parbhani in and 2005-06 was Rs. 18142 as against the State per capita income of Rs. 32587.

Table No. 2.15
Gross District Domestic Product of Parbhani
(at 2004-05 constant prices) 2011-12

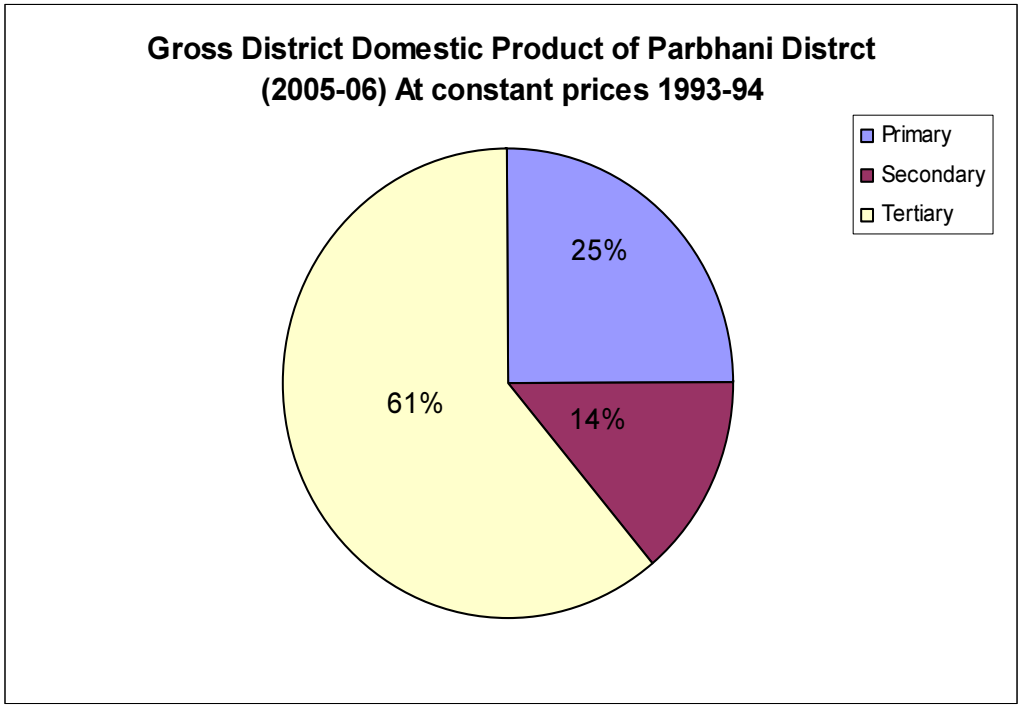
(Rs. 000)

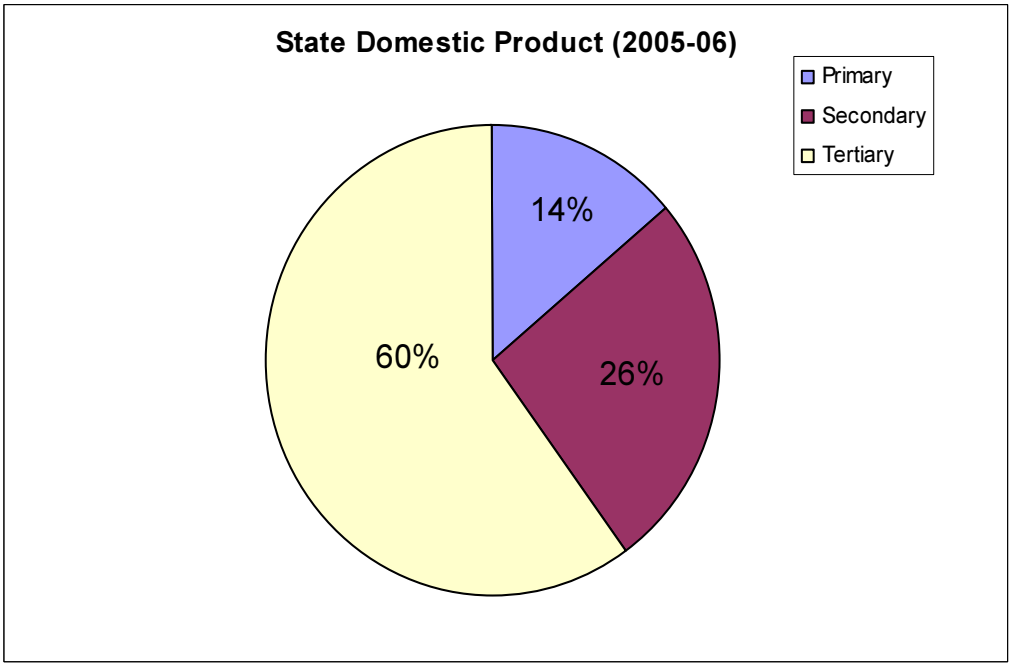
Sr. No.	Sector	Amount	% of total	State GSDP%
1	Primary Sector	7500800	25.36	14.21
2	Secondary Sector	3863200	13.06	26.47
3	Tertiary Sector	18208200	61.58	59.32
	Total	295722200	100	100
4	Per capita district Income	18142		
5	Per capita state income Rs.	32587		
6	Dist. per capita income as % of state per capita income	55.6		
7	Human Development Index (HDI)	0.43		0.58
8	Human Poverty Index (HPI)	22.50		16.22

Source: District Socio-economic review- Hingoli & Parbhani G.O.M. 2006-07. P-20
Human development Report 2002, Maharashtra GOM Economic Survey of Maharashtra

2005-06 GOM T14

Diagram 2.2





INTRA-DISTRICT RELATIVE GROWTH RATES: PARBHANI DISTRICT.

Table no. 2.17 shows the per hectare yield of various crops, in 9 talukas/blocks of Parbhani district for the year 2005-06. Similarly, this table also indicates the average per hectare yield of these crops at the district level. It may be observed that there is a big variation between per hectare yield rates at district level and per hectare yield rates of the same crop at Taluka level. We have assumed that the per hectare yield rates at Taluka level represent the relative growth rates, with reference to District level yield rates.

INDEX OF PRODUCTIVITY:

We have assumed that productivity per hectare of each crop at the district level is 100. With this base, the productivity of each crop at the block level is indexed. For example, the productivity of Kharif Jowar at district level is 973.8 kg. per hectare, while the productivity of kh. Jowar in Prbhani block is 1149.3 kg. per hectare or 118 or 18% higher than the district average; while in Purna block, the productivity of kh. Jowar is very low at 530 kg. per hectare or 54.4% of the district level productivity. By following the same methodology, we have estimated indices of 9 major crops for all the 9 blocks of Parbhani district. Finally, a composite index of all 9 crops for each block is estimated. These indices represent intra-district or Intra Taluka growth differentials for Parbhani district the following results are important.

a) Palam block has scored highest growth rates with a composite index of 192.8; while on the other hand Purna block has the lowest composite index of 69.7, indicating a very low growth rates of crops.

b) The following blocks have composite index above 100, indicating better performance; they are; i) Palam (192.8); ii) Pathri (147.2); iii) Sonepeth (112.0); iv) Jintur (105.5). Four blocks.

c) The following blocks have composite index below 100; indicating below normal performance. They are, i) Purna (69.7); ii) Gangakhed (79.8); iii) Manwat (89.5); iv) Sailu (94.7) and v) Parbhani (95.9).

FACTORS RESPONSIBLE FOR INTRA-DISTRICT GROWTH DIFFERENTIALS:

The following factors are generally responsible for intra-district growth differentials.

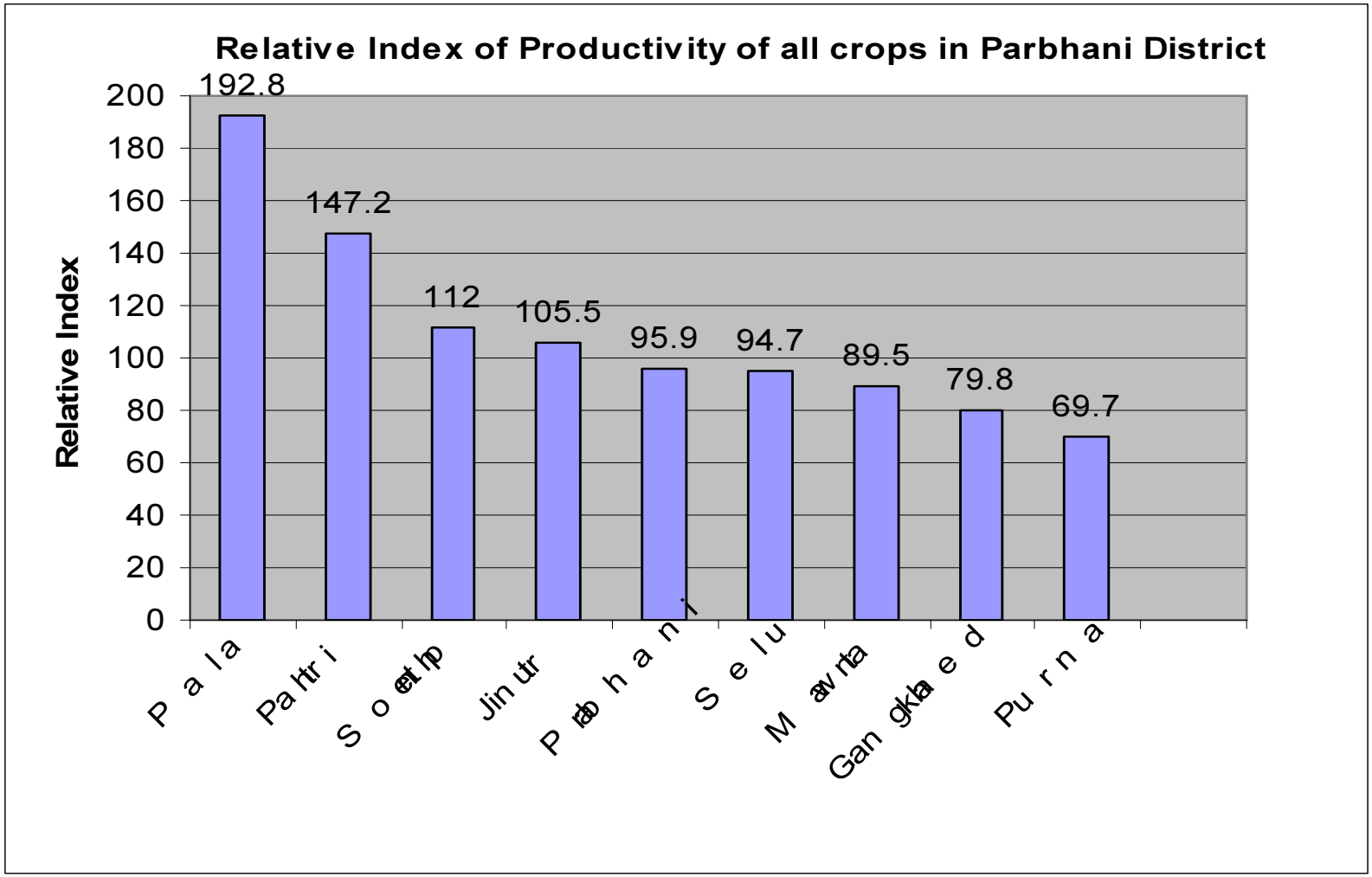
i) Nature of soils, which differ from block to block.
ii) Timely and adequate rainfall, may not be possible in all blocks.
iii) The extent of irrigation facilities available in each block also differ.
iv) Supply of timely and adequate crop loans may result in different yield rates.
v) Proper use of inputs like fertilizers, seeds, pesticides, also results in different growth rates.
vi) Proper management of available resources, entrepreneurship, are other factors leading to differences in growth rates in various blocks.

Table no. 2.16
Intra – District Growth Differential of Major Crops Parbhani District 2011-12

(Productivities Kg. / ha.)

Sr. No.	Crop	Dist. Average	Parbhani	Purna	Pathri	Palam	Gangakhed	Sonpeth	Sailu	Manwat	Jintur
1	Kh. Jowar	973.8	1149.3	530	1689	1941	890.9	610	448.3	685	938.6
		(100.00)	(118.0)	(54.4)	(173.4)	(199.3)	(91.5)	(62.6)	(46.0)	(70.3)	(96.4)
2	Paddy	550.5	369.1	278.5	-	1343	427.2	464	653.7	392.5	671.45
		(100.00)	(67.0)	(50.6)	-	(243.9)	(77.6)	(84.3)	(118.7)	(59.1)	(122.0)
3	Bajra	531.1	526.1	291	962	932.5	435.5	715	384.5	401.8	484.9
		(100.00)	(99.0)	(54.8)	(181.1)	(175.6)	(82.0)	(194.6)	(72.4)	(75.7)	(91.3)
4	Tur	508.7	525.9	376.2	819	775	411.3	735	216.3	682	419.9
		(100.00)	(103.4)	(80.0)	(161.0)	(152.3)	(80.9)	(144.5)	(42.5)	(194.00)	(82.5)
5	Cotton	513.6	562.9	391.8	756.7	810	309.0	813.3	406	533.8	459.3
		(100.00)	(109.6)	(76.3)	(147.3)	(157.7)	(60.2)	(158.4)	(79.8)	(103.9)	(89.4)
6	Sunflower	578.2	516.8	246.2	734.1	1062.3	494.5	292	535.4	376.5	679.6
		(100.00)	(89.4)	(42.6)	(127.0)	(183.7)	(85.5)	(50.5)	(92.6)	(65.1)	(117.5)
7	Mung	340.3	225.2	372.4	520.4	88	201.1	561	563.5	376.2	243.3
		(100.00)	(66.2)	(109.4)	(152.9)	(25.9)	(59.0)	(164.9)	(165.6)	(105.5)	(71.5)
8	Udid	371.2	347	215	285.8	89.6	224	280.3	252.6	195	412.2
		(100.00)	(99.5)	(57.9)	(77.0)	(24.1)	(60.3)	(75.5)	(148.9)	(52.5)	(111.0)
9	Soybean	969.6	1084	984	1530.8	316	1176.4	705	832.5	710	1630.5
		(100.00)	(111.8)	(101.5)	(157.9)	(32.6)	(121.3)	(72.7)	(85.9)	(79.2)	(168.2)
	Total Index	**(900)**	**(863.9)**	**(627.5)**	**(1177.5)**	**(1195.1)**	**(718.3)**	**(1008.0)**	**(852.4)**	**(805.3)**	**(949.8)**
	Average Composite Index	**(100)**	**(95.9)**	**(69.7)**	**(147.2)**	**(192.8)**	**(79.8)**	**(112.0)**	**(94.7)**	**(89.5)**	**(105.5)**
	Rank		**5**	**9**	**2**	**1**	**8**	**3**	**6**	**7**	**4**

Diagram 2.3


Relative Index of Productivity of all crops in Parbhani District
Relative Index
200
180
160
140
120
100
80
60
40
20
0
192.8
147.2
112
105.5
95.9
94.7
89.5
79.8
69.7

2.3 : VISION :

I - OUR VISION OF THE DISTRICT IS THAT IN THE NEXT TEN YEARS:

i) It should be doubling its production from agriculture and allied activities;

ii) It should have — —
   a) Modern physical infrastructure ;
   b) Modern social and institutional infrastructure;
   c) Healthy and sustainable environment; and
   d) Full employment; and

iii) It should be free of
   a) Poverty;
   b) Illiteracy and ignorance;
   c) Social disparities; and
   d) Gender disparities.

II- OUR TEN YEAR VISION FOR THE FARMERS OF THE DISTRICT IS THAT ALL OF THEM SHOULD

i) Have adopted modern farming technologies and best practices and should be reaching achievement of maximum yields and optimum agriculture production from their farms, water and other resources;

ii) Have at least one well or one farm pond each fitted with micro irrigation system and should be optimally utilizing their rain water and ground water resources;

iii) Have had soils testing of their lands done and received and acted upon scientific advice from experts and used inputs for preservation and enrichment of their soils;

iv) Be getting adequate, timely, and quality pure supplies of seeds, fertilizers, pesticides and other inputs;

v) Have taken to using modernized tools and implements, reduced drudgery of manual work and have taken to farm mechanization to overcome shortage of hired labour;

vi) Have taken to growing higher value crops and specially to irrigated or rainfaid horticulture;

vii) Have good credit and marketing facilities and supporting infrastructure like all weather connectivity, transport and market intelligence; and

vii) Have caring and technologically competent extension workers willing to rush advice and help at the shortest notice of needs,

viii) We also envision formation of an Associations For Progressive Fanning (AFPFS) separately for each bloc with village wise branches and a federation for the district to positively support spreading of modem implementation of CDAP programmes at the Panchyat Samiti and Gram Panchayat levels. PPFs will take special care to ensure total coverage of all the farmers and that no farmer is left out.

III - OUR TEN YEAR VISION SPECIALLY FOR THE ASSET POOR AND ASSET LESS FARMERS IS THAT ALL OF THEM:

a. Have joined self help groups (SHGs) specially promoted for them;

b. Through those SHGs and with training, financial and backup promotional support from DRDA, Z.P. Gram Panchayat, Panchayat samiti, Progressive Fanning Society, Banks and the Agriculture department get themselves transformed into capable providers of critical services to agriculture of the village;

c. With those critical agro services they have started contributing to the rejuvenation of agriculture of the village including their own presently non-viable small farms;

d. With their non-viable farms back in progressive production line and with the additional employment and incomes they get from the agro services they are providing, most of them have come out of poverty;

e. At least 20% out of them have made more progress and have setup their own micro - agro enterprises; and

f. Al! of them have gained self confidence for making more progress in future and are all living with dignity and in well being,

For actualizing this vision, the C- DAP attempts to explore possible ways of better utilization of natural, physical and human resources. It attempts to discover and locate latent potentials of growth and development and is making proposals for activating human energies and social organizations for their full utilization.

C -DAP proposals for reforms and strengthening of the extension agencies should help inform the farmers of the latest technologies and adequately motivate them to diligently work for their own advancement.

The reforms and strengthening of the implementation agencies in the district are of crucial importance. The best policies and programmes fail because of poor governance and shortcomings in implementation. An innovative re-organization to provide missing coordination links within the different wings and departments involved with implementation is absolutely necessary. It is also imperative to set up reasonable working relationships with Panchayat Raj Bodies, NGO's and Public Private Partnerships,. If the government is serious about transformation of rural economy and rural society through massive programmes like RKVY it must take early steps to provide for a strong inspired implementing agency to lead that movement in the district and to get results.

This C-DAP has recommended several strategies for various sub-sectors to overcome the reasons of backwardness and to accomplish the vision stated in para above. Details like rationale behind them, action plans with physical targets, financial requirements and outcomes, and implementing schedules will be found in the related chapters. Action plans have been formulated so that their implementation will make a great impact on the agricultural growth and development of the district. It is worthwhile to emphasize that every element of action plan under each strategy

positively contributes to the desired results. Most elements will be simultaneously in operation and will have additive effects on outcomes of each other. That add-on effect would lead to still higher growth.

C-DAP targets are realistic and not difficult to achieve. Individual mediocrities and indifference and departmental egos have, however, halted .many fast trains in the past. Top bosses should be alert. The above weaknesses and many more have to be overcome. Enthusiasm for a good work has to be sustained at all official and non-official levels.

The C-DAP should be implemented in a mission mode. Print & electronic media will help to motivate people for more hard work and more positive roles. Every farmer (large or small), every Gram Panchayat, every NGO or informal group or committee should be a doer (Karta), earnest and fired by the spirit of the C-DAP. The opportunity should not be lost. C-DAP throw a challenge to them. Every one is on trial and has to contribute his utmost towards the successful accomplishment of the mission.

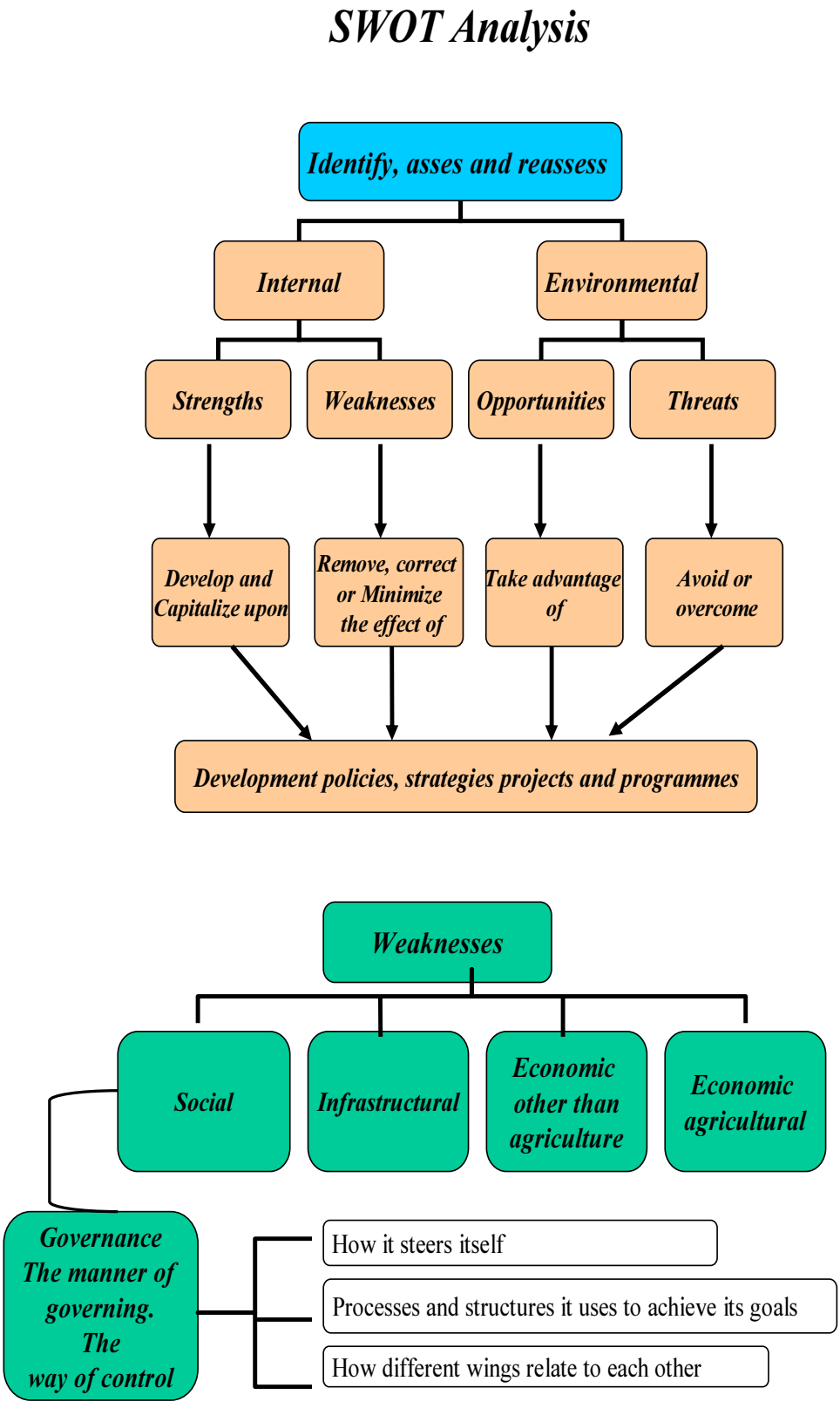
CHAPTER III
SWOT ANALYSIS OF FARM SECTOR IN PARBHANI DISTRICT

THE MAJOR STRENGTHS OF THE FARMING AND NON-FARM SYSTEMS OF PARBHANI DISTRICT :

1) District is strategically located nearer to cities like, Hyderabad, Aurangabad, Mumbai & Jalna where fresh agricultural produce can be transported overnight due to the broad-gauge network.
2) Appropriate agro-climatic situations suitable for cultivating diverse range of crops. The district has black soil rich in nutrients.
3) The district has assured rainfall every year & is a water rich district.
4) Good surface irrigation potential, supported by groundwater.
5) The district is known as Maharashtra's storehouse of Jawar.
6) Farmers have well accepted dairy as supportive enterprise which gives good livelihood support. Medium to medium soils which are suitable for growing sugarcane.
7) The district could manage to fetch a total price of 240 lakh Rs. through sale of fish. 100% the total area which is useful for fishery is utilized in the district. The particular varieties of fish obtained are in good demand in Kolkata.
8) Availability of electricity for irrigation for at least 10-12 hours per day. Village electrification is cent percent.
9) Crop loans are available from co-operative and nationalized banks.
10) Machineries like tractor/tractor drawn implements are available in almost all villages, the farm families have access to these on rental basis Bullock power is utilized for certain operations like sowing / inter-cultivation / ear thing up etc.
11) Labour are available for carrying out skilled operations like planting of sugarcane, onion thinning, pruning of fruit crops.
12) Availability of inputs like seeds, fertilizers, insecticides, cattle feed and veterinary services within 8-10 kms. from the villages.
13) Planting material and seeds of improved varieties is made available for farmers by Co-operative sugarcane Factories, Agricultural University, Agricultural Department..
14) Farming community is ready to adopt modern technology such as drip irrigation, cultivation of fruits and vegetables.
15) The basic resources required to increase the production of fruits & vegetables is ample.
16) Irrigation facilities & green fodder availability has given a boost to dairy sector.
17) There are 7 agricultural marketing committees. These committees have built rest houses for farmers at the head quarters. Drinking water facilities also have been made available for farmers & bullocks.
18) Ware houses network is available in the district.
19) There is a Doordarshan Broadcasting centre at Parbhani since 1994. There is also a radio – substation at Parbhani.
20) There is a well – equipped modern drama theatre at Parbhani & also an ultra –modern swimming tank. There are 15 cinema theatres in the district.

21) The Govt. of Maharashtra has been implementing "Mahapik Abhiyan" in tune with Dr. Swaminanthan Committee Recommendation. Under Mahapik 319 Krishi Vigyan Mandals have been set up in the district.
22) Marathwada Agricultural University is located at Parbhani. The University informs farmer about latest agricultural technology through exhibition & demonstration. The "Krishi Tantradnyan Saptah" of the University was visited by more than 2 lakh farmers in 2006-07.
23) Agriculture Technology Management Agency (ATMA) has been set up in the district for increasing production & productivity in the district.
24) There is 1 polytechnic college, 3 Govt. ITIs & a few technical schools providing technical education useful for industrialization.
25) Facilities for education in Pharmacy and Computers are also available in the district.
26) Road length per 1000 sq km is greater than state average & there is excellent railway network connecting important state capitals like Mumbai, Bangalore & Hyderabad.
27) Well developed banking services up to the village level. The Nationalized banks, RRBs and District central co-operative bank has branches in rural areas.
28) Availability of sizable surplus agricultural produce for development of agro-based industries, e.g. Soyabean, Jawar, oilseeds etc.
29) There is sufficient no. of primary schools per lakh population in the district.
30) There are sufficient primary health centres per lakh population.
31) Most of the villages have drinking water supply (full or partial).
32) The productivity of Jowar per ha in the district is well above state average.

Diagram 3.1


SWOT Analysis
Identify, asses and reassess
Internal
Environmental
Strengths
Weaknesses
Opportunities
Threats
Develop and Capitalize upon
Remove, correct or Minimize the effect of
Take advantage of
Avoid or overcome
Development policies, strategies projects and programmes
Weaknesses
Social
Infrastructural
Economic other than agriculture
Economic agricultural
Governance The manner of governing. The way of control
How it steers itself
Processes and structures it uses to achieve its goals
How different wings relate to each other

THE MAJOR WEAKNESSES :

1) The district is classified as "D+" in terms of industrial development.
2) As the district is industrially backward, use of electricity for industrial purpose is as low as 1.1 % of the total use of electricity for various purposes.
3) Parbhani employment exchange was not successful in making employment available to the registered unemployed people.
4) There is need for uninterrupted power supply & also for additional electricity connection for energizing agricultural pump sets.
5) Of the total registered dairy societies in the district, more than 75% are defunct. There is urgent need to revive there.
6) The fund utilization under ATMA (Agriculture Technology Management agency) in the district is very low.
7) Accepting a few oil extracting units, dal mill units, there are no other processing units for other agricultural produce in the district.
8) There is a serious lack of availability of hassle – free institutional credit for marketing for farmers.
9) There is a lack of awareness of schemes among both bankers & farmers.
10) There is a lack of tie-up between public warehouse & banks for providing credit for marketing to farmers in the district.
11) There is severe problem of ground water table depletion in the district. So there is need for adopting water – conserving cropping pattern.
12) Though almost all plots in Parbhani MIDC have been allotted, in other MIDC area there are very few takers for the plots available.
13) Though there is consistent increase in Soya bean production, there is not a single unit in the district for processing Soyabean.
14) Though there is a lot of production of dals in the district there are only three Dal units.
15) Non judicious application of chemical fertilizers leading to decreasing organic carbon content and deficiency of micro nutrients.
16) Lack of application of recommended doses of organic matter and green mannuring.
17) Lack of in situ moisture conservation practices.
18) Lack of hygienic cultivation, handling, grading, packaging and storage facilities for different crops.
19) Non adoption of integrated pest management leading to increasing cost of production.
20) Farmers are organized for marketing only in sugarcane and dairy. Such organized activities are lacking in other horticultural crops.
21) Weak industrial base; weak non-farm sector
22) Lack of work culture among industrial workers.
23) Very meager forest area (1% of geographical area)
24) Huge No of non Performing Assets of the Co-operative banking system.
25) Lack of entrepreneurship.
26) Problem of repayment in certain sectors.
27) The industrial sector is weak as there is absence of natural mineral resources. Which has led to absence of basic heavy industry in the district?
28) Very low level of urbanization (31%).
29) Weak marketing services.
30) Very low Human Development Index as against the state average of 0.58.
31) Very high Human Poverty Index (22.5); as against the state average of 16.22%

THE MAJOR OPPORTUNITIES

1) There is ample availability of vegetables & fruits for agro-processing industries in the district & also the final production can have access through broad gauge railway network to metro cities like Mumbai, Bangalore & Hyderabad which are capital cities of three progressive states in India.
2) There are three co-operative sugar factories in the district. This offers scope for services like motor – rewinding etc.
3) Fruits & vegetables are perishable products. So it is necessary to establish agro-processing units to preserve these products. The state Govt. also offers incentives for agro & fruit processing units.
4) The area under high yield crops is rising continuously.
5) Demand for milk is significantly less than production of milk in the district. The surplus milk is exported on a large scale to other districts for production of milk – powder & other milk products. There is great opportunity in the district for setting up milk – processing units.
6) Though the district lacks in availability of minerals, there is ample availability of sand & stones & also the mud required for brick – making is available in the district.
7) In the Palam taluka of the district, there is an island called Jambhulbet in the river Godavari. This is a very beautiful island where tourism related development can be planned.
8) Marketing arrangements, if strengthened, will improve infrastructure support for the agricultural sector which is the mainstay of the district.
9) Water users Associations can be formed for judicious use, supply & management of water.
10) Fruit Growers Association can be set up to ensure proper storage, marketing & processing of fruits.
11) The incentives & credit linked subsidies available under National Horticulture Mission should be availed.
12) There is scope for cold storage units for fruits.
13) The social forestry Department can work as a nodal agency for developing agro – forestry model farms for demonstration purpose.
14) Till few years back, Parbhani was one of the leading districts for Sericulture activity. It has income & employment generation potential. Manav Vikas Mission is promoting Sericulture in Jintur & Palam blocks. It should be encouraged elsewhere also.
15) There is scope for forming women's dairy co-operative societies.
16) Veterinary clinics can be encouraged under the venture capital fund scheme for dairy sector in Parbhani district, involving veterinary graduates.
17) Selu has been identified as potential growth centre for non-farm activity by the MDC and the MDC has established industrial area at Selu.
18) MCED offers entrepreneurship development programmes in the district.
19) Govt. of India (Ministry of Food Processing) has selected Parbhani district for giving training for prospective entrepreneurs interested in setting up agro/food processing units.
20) New & existing coir units & food processing units are eligible for 15% subsidy under the GOI scheme titled "Credit Linked Capital Subsidy Scheme for Technology upgradation" for which NABARD & SIDBI are nodal agencies for disbursing subsidy.
21) There are NABARD's special schemes for women entrepreneurs.

22) Sizable area of the district is under spices cultivation. A few spices processing – specific EDPs need to be conducted in Parbhani district.
23) There is scope for cultivation of aromatic & medicinal plants in the district.
24) Jaggary units can be established in the district.
25) Prices of fruits & vegetables in the developed countries like the US & in EU countries are very high. Farmers can be helped out by different agencies to comply to the health & sanitary standards in there countries as they have opportunity in terms of market access under the WTO regime.

THE THREATS TO THE FARMING AND NON-FARM – SECTORS

1) According to 2001 census report, 33% of the population in the district is illiterate.
2) The share of district income to the income of Maharashtra state is less than 1%.
3) Due to industrial backwardness & lack of availability of nearby market, the production of fruits & vegetables could not grow as per expectation, despite availability of irrigation facilities in the district.
4) More than 34% of the total registered factories were closed (as per the data for 2004).
5) Lack of uninterrupted power supply is a serious threat to the already weak industrial sector & the potential linked expectations regarding agro-milk & fruit processing units.
6) Of the existing 3 sugar factories only one is operational while other two are non – functional.
7) There is a lack of entrepreneurial awareness.
8) There is a lack of exposure to food/fruit processing technology.
9) Heavy use of chemical fertilizers & pesticides threatens the productivity & quality of soil in the long run. Therefore the Dept. of Agriculture, GOM should popularize organic farming. Farmers can avail the capital investment subsidy scheme.
10) In spite of NABARD providing assistance under GOI scheme for dairy & poultry development, financing by banks to this segment in the district has not picked up.
11) Agricultural marketing network in the district is inadequate to handle even the present volumes of agricultural produce.
12) Presently the marketing credit needs of farmers in the district are met by traders & money lenders at higher interest rates. Banks should provide credit to farmers on the basis of pledge receipts issued by public godowns.
13) Lack of sufficient cold storage, cool chain may incur losses particularly to the horticultural crops due to price fluctuations and losses in handling & transport.
14) Lack of recommended quality standards may affect expected returns.
15) Lack of market research for identifying food habits may affect marketing and net returns.
16) Lack of infrastructural development directly affecting farming.
17) Rising cost of production of industrial goods due to low productivity of workers, absenteeism among workers.
18) Threat to agricultural products from import of goods, under the WTO regime.

CHAPTER IV
DEVELOPMENT OF AGRICULTURE SECTOR

4.1 INTRODUCTION:

Agriculture is the major occupation of majority of the population in Parbhani district. Economic, industrial, educational, social development of this area is dependent on agricultural production. Despite of higher promotions per capita availability of food over time did not increase significantly. The growth rate of agricultural production is only around 2 per cent. The growth rate of production in agriculture must be more than the growth rate of population. Hence there is an urgent need to accelerate agricultural growth to address issues on food security, nutritional adequacy and income generation. This can be achieved by identifying the problems in crop production, infrastructure facilities, issues related to the natural resources, input management and accordingly there is need to improve agricultural services keeping in view the vision and objectives.

4.2 LAND USE:

The total geographical area of Parbhani district is 631115 ha. and the net sown area is 518775 ha (82.5 per cent). Out of total cultivable area, the area sown more than once is about 177238 ha and hence gross cropped area has increased upto 696013 ha (110.3 per cent of total geographical area) and the cropping intensity in the district is 134.2 per cent. The area under forest is 6306 ha which is only 1.00 per cent of the total geographical area. Cultivable and fallow land is about 5.9 per cent and 4.6 per cent of total geographical area respectively which can also be converted as productive land in future. (see table 4.1)

The land use pattern of Parbhani district is compared with the land use pattern of Maharashtra state.

4.3 Soil Health

Approximately so percent area has class I land with a good potential for production. There are soil which have no limitation. However the fertility index indicate that most of them are depleted in nutrients with growing of high yielding varieties. Gt. of more than 50 percent samples indicates low or medium N, P and C. As regards the micronutrients, the soils indicates sufficiency of Cu and Fe. However soils are deficient at certain location. The physical and chemical constraints are described below. These are swell shrink soils which a serous management problem.

Constraints:

- Low hydraulic conductivity and hence water stagnation or longer duration for Vapsa condition which does not allow favourable air water ratio around roots.
- Occurrence of Calcium carbonate induces imbalance in nutrient availability.
- Shallow soil poses a problem of low water retention capacity and low organic matter.
- Multi-nutrient deficiency
- Susceptible to erosion.
- Soil health in terms of physical, chemical and biological condition is poor.

Potentials:
Soils provide fairly long duration of growing period.

- Soils are productive if properly managed.
- Soils suitability facilitates growing of number of different crops.
- Irrigation facilities further increases productivity.

Land Management Strategies:

- Watershed development needs first priority.
- Watershed based crop planning is a must in order to exploit high potential of the district.
- Soil water storage and long growth periods for crops available in black soils should be properly utilized for increasing growth rate of productivity.
- Grapes, mango, tamarind and Jambhul based horticulture need to be developed under larger areas.
- Adopt recommended practices of organic manures and fertilizer on the basis of soil test.

In order to achieve the 4% growth some of the important steps and projects are suggested.

The imbalances in nutrient availability, physical conditions and micro nutrient deficiency situation has led to deterioration of soil health. The first and foremost job is to restore soil health so that productivity increases on sustainable basis. The first and foremost job is to restore soil health so that productivity increases on sustainable basis. The important steps are suggested here. The projects regarding soil and land care management have been formulated (see 4.10). There are several aspects of soil health which include soil testing laboratories, production of bio-fertilizers, compost and vermi-compost preparation, green manuring and organic farming. Separate provision for integrated watershed development programme of each taluqua is presented in the report.

Table 4.1
Land utilization statistic of Maharashtra (2011)

Sr. No.	Particular	Maharashtra		Parbhani	
		Area	%	Area	%
1	Geographical Area	30758	100.0	631.115	100.0
2	Area under forest	5216	17.0	6.306	1.0
3	Land not available for cultivation a. Barren & uncultivable b. Land put to non agric. uses	1721 1374	6.0 4.4	39.495	6.3
4	Other uncultivated land a) Cultivable waste land b) permanent pastures and grazing lands c) land under miscellaneous tree	914 1249 246	2.8 4.0 0.8	24.443 8.956 3.977	3.9 1.4 0.6
5	Current follows	1216	3.9	29.163	4.6
6	Other follows	1192	3.8		
7	Net area sown	17631	57.3	518.775	82.2
8	Area sown more than once	4773	15.5	177.238	28.1
9	Gross cropped area	22405	72.8	696.013	110.3

4.4 WATER RESOURCES AND MANAGEMENT :

Availability of surface water in Marathwada region is far less than other regions of Maharashtra as under

Sr. no.	Region	Availability of Water Per hectare
1	Marathwada	1500 M^3
2	Vidarbha	4348 M^3
3	Rest of Maharashtra	9100 M^3

Normal requirement of water for irrigation is 3000 m3/Ha as per Maharashtra Irrigation Commission.

Availability of surface water in Parbhani, Hingoli district is of the order of 1660 M^3 / Ha. as against requirement of 3000 M^3 /Ha. The average rainfall for Parbhani is 854mm. Moreover five out of nine taluquas have been included in the latest list of 195 D.P.A.P. Taluquas.

100% area of the District falls in Godavari Basin which flows through the centre of lower half of District Purna basin lies in the exterior northern portion where as Dudhana & Karpura Basins lie in the central northern portion of the district.

The total availability of ground water in the district is about 132600 HaM. The no. of existing wells is about 20598. About 8773 wells are in the command of irrigation projects, where as balance 11825, say 11800 wells are in non command area and need recharging. There exists potential for digging additional 1,12,071 say 1,12,000 wells as per latest survey.

Godavari river flows through the middle of the southern half of the district. Purna Dudhna, Karpura Masoli, Sita, lendi, Penganga are some of main rivers flowing through the district. Command areas of major irrigation projects viz. Jaikwadi, Majalgaon, Purna, lie in the district. Purna,Jaikwadi, projects have already been completed along with medium projects and minor irrigation projects. Two major projects viz. lower Dudhana & Majalgaon Project are still under construction along with a no. of medium and minor irrigation projects.

The total surface water potential of the district as per present plan is about 2, 87,472 Ha. Irrigation potential of about 163491 Ha has already been created up to June 2008. It is obligatory that the balance irrigation potential of 1, 51,115 is created in next 4 years and all area brought under irrigation. Adequate provision will have to be made under Bharat Nirman, A.I.BP etc 1,54,872 and additional irrigation potential of created before end of 11^{th} plan.

Thus the total irrigation potential of Parbhani district is about 287472 + 132600 = 40072 Ha. Say 584000 Ha. It is desirable that all this potential is created in next four years.

Actual irrigation during the year 2006-07 is only of the order of 69280 ha. The low utilization of created irrigation potential is mainly due to non uniform spatial

distribution of rainfall resulting in non-availability of adequate storage of water in times of need, poor maintenance and repairs of irrigation project and Deep Black Cotton soil etc.

In view of the paucity of water in general in Marathwada, it is obligatory that all available water is used most economically and efficiently by switching over to micro irrigation to feasible extent. It is desirable and recommended that 90% subsidy should be considered for all farmers as an incentive to switch over to micro irrigation. However only 50% subsidy is considered while preparation of C-DAP estimates as per current practice.

The following measures are recommended for judicious, economic efficient use of all available water:

a) The existing Canal and Distribution System of Irrigation projects in operation is renovated and modernized so as to ensure that water in adequate quantity reaches all created potential area in next 4 years. Most of the major and medium projects in operation are 30 to 40 yrs old and hence it is obligatory that all available water is judiciously and efficiently used. Adequate provision for modernization and Renovation of canal Distribution system of major and medium projects will have to be made under Bharat Nirman, AIBP or any other source. So as to ensure that full irrigation utilization is achieved. The provision for modernization of miner irrigation projects are included C-DAP under head minor irrigation.

b) All major and medium irrigation projects presently approved and those under construction are completed in next 4 years and addl. irrigation potential created by making Adequate provision under Bharat Nirman or ABIP etc. Provision for completion of all approved minor irrigation project is made in C-DAP under head minor irrigation.

c) About 25% of the total surface irrigation potential viz 72000 Ha. is brought under micro irrigation 50% of this area i.e. about 36000 Ha is brought under drip irrigation and balance 36000 Ha is provided with sprinkler irrigation in next 4 years.

d) All the existing 11,800 wells outside command area of irrigation projects are recharged so as to ensure increased availability of water in next 4 years.

e) About 1, 12,000 new wells are dug and completed in next 4 years Govt. may facilitate granting of loans to farmers by giving guaranty.

f) 50% of the 132000 total wells in the district i.e. 66000 are provided with drip irrigation facilities and balance 50% i.e. 66000 wells are provided with sprinkler irrigation facilities in next 4 years. In this context it is strongly proposed that 90% subsidy is provided to all farmers in view of shortage of water and the farmer's contribution is limited to 10% only. However subsidy of 50% is considered for farmers as per existing rules in preparation of C-DAP plan.

g) 1250 farm ponds are created in each taluka every year there by creating 45000 farm ponds in the district by end of 4 years. (9 talukas).

h) Encouraging and making obligatory, participatory irrigation by forming water user's societies so as to ensure efficient use of available water. Statement showing requirement of funds every year are enclosed for ready reference.

TABLE 4.2
UTILIZATION OF IRRIGATION POTENTIAL AND POTENTIAL CREATED UPTO JUNE 2012

Sr. No	Classification of Project	Upto June 2012									
		Pathri	Manwat	Selu	Jintur	Purna	Parbhani	Palam	Gangakhed	Sonpeth	Total
1	Major Projects (3)										
	Purna	0	0	0	0	15370	772	0	0	0	16142
	Jaikwadi	28837	11039	96	0	17428	33529	0	6471	0	97400
	Majalgaon	0	0	0	0	0	0	134	5301	19895	25330
2	Medium Projects (3)										
	Karpara, Masoli, Borna	0	0	0	3119	0	0	0	4413	0	7532
3	Minor Projects (-)										
	State Level (20)	486	470	0	4415	301	404	473	1786	0	8335
	. . . .. ……. Level(22)	0	0	100	1646	0	0	100	307	0	2153
4	Lift Scheme	759	0	0	988	969	0	0	928	0	3644
5	Kolhapur Type (44)	36	151	128	251	21	332	71	156	5	1151
6	Percolation (38)	0	0	110	958	0	126	95	515	0	1804
	Total (142)	30118	11660	434	11377	34089	35163	873	19877	19900	163491

4.5 : MAJOR CROPS IN THE DISTRICT:

CROPPING PATTERN AND PRODUCTIVITY:

Agriculture and allied activities are the main sources of livelihood for majority of rural masses and control the economy of the district. Out of total geographical area (631115 ha) of Parbhani, the net shown area is 518775 ha. (82.2%) and total gross cropped area is 836947 Ha (110.3%). About 66.71 percent of total gross cropped area is under Kharif crops, and 32.90 percent is under rabi crops. About 45.9 percent of the gross cropped area including intercrop area is cultivated for different cereal crops such as Sorghum, Bajra, Maize, Wheat, 22.9 percent area including intercrop area for pulses (Tur, Gram, Green gram, Black gram), 10.4 percent area including intercrop area for oilseeds (Soybean, Safflower, Sunflower, Groundnut), 25.7 percent area for cotton, 1.9 percent area for sugarcane and other area for Fruits, Vegetables etc. Proportion of cotton is maximum in Kharif season followed by K. Jowar, Tur, Mung, Soybean etc. Similarly proportion of Jowar is maximum in rabi season. Wheat, Sugarcane, Gram, is cultivated on irrigated area.

Table No. 4.3

rea production and productivity of crops

(Average of 2011-12 to 2013-14)

Sr.no	Crops	Area in "00"ha.	Production in "00"ton.	Productivity kg./ha
1	Kh Jowar	453.00	559.18	1234.40
2	Rice	14.83	6.46	436.24
3	Bajra	41.166	32.64	787.54
4	Maize	17.56	16.57	944
5	Other cereals	4.53	2.33	516
6	Tur	683.66	436.03	637.80
7	Mung	363.16	184.99	509.40
8	Udid	110.3	47.77	433.13
9	Other pulses	7.86	4.22	538
10	Groundnut	2.00	1.24	620
11	Sunflower	6.50	2.38	367.64
12	Soyabean	1450.50	1824.35	1257.745
13	Sesamum	20.40	3.01	148
14	Other Kh Oil Ssed Crops	15.50	3.47	224
15	Sugarcane	168.83	12038.57	71305.91
16	Cotton	2141.93	715.38	333.99
17	K.Vegetables	81.61	19.58	240

	Total :-	**5583.33**	**15898.04**	
Sr.no	**Crops**	**Area in "00"ha.**	**Production in "00"ton.**	**Productivity kg./ha**
18	R.Jowar	1573.26	2737.56	1740.06
19	Wheat	313.39	471.78	1505.41
20	R.Maize	4.22	1.06	252
21	Other cereals	1.42	0.32	232
22	Gram	560.97	375.46	669.32
23	Sunflower	288.50	153.33	531.49
24	Other R. Oil Ssed Crops	7.19	1.11	1.55
25	Summer Sunflower	0.75	0.46	620
26	Summer Maize	12.63	3.98	315
27	Summer Groundnut	19.42	15.13	810
28	Total Rabi crops	2753.34	3743.06	
29	Total Summer	**32.80**	**19.57**	
30	Total cropped area	8369.47	19660.67	
	Total Cereals	3436	3831.65	
	Total Pulses	1725.95	1048.47	
	Total Oilseeds	1815.15	2006.92	

Table No. 4.4

DISTRIBUTION OF AREA UNDER DIFFERENT CROPS

Sr.no	Crops	Distribution of under different Crops (%)
1	Kh Jowar	8.11
2	Rice	0.27
3	Bajra	0.74
4	Maize	0.31
5	Other cereals	0.08
6	Tur	12.24
7	Mung	6.5
8	Udid	1.98
9	Other pulses	0.14
10	Groundnut	0.04
11	Sunflower	0.12
12	Soyabean	25.98
13	Sesamum	0.36
14	Other Kh Oil Ssed Crops	0.28
15	Sugarcane	3.02
16	Cotton	38.36
17	K.Vegetables	1.5
	Total Season	**66.71**
18	R.Jowar	57.14
19	Wheat	11.38
20	R.Maize	0.15
21	Other cereals	0.05
22	Gram	20.38
23	Sunflower	10.48
24	R. Sunflower	0.16
24	Other R. Oil Ssed Crops	0.26
25	Summer Sunflower	2.27
26	Summer Maize	38.88
27	Summer Groundnut	58.85

28	Total Rabi crops	32.90
29	Total Summer	
30	Total cropped area	
31	Total Cereals	41.06
32	Total Pulses	20.62
33	Total Oilseeds	21.69

Average yield of cotton is only 333.9 kg/ha of lint, which is higher as compared to state average. But, the average yield of cotton in the district is very low when it is compared with frontline demonstration. Second important crop of this area is rabi jowar which is grown on 1.57 lakh ha. area of the district and average yield of rabi jowar is only 985 kg / ha.

The average yields of Bajra, Kh. Jowar, Tur, Mung, Udid are also not satisfactory. The yields of crops, which are grown on irrigated area are higher as compared to rainfed. But, the proportion of irrigated area is very low, which needs to be increased.

Average yield of crops when it is compared with average yield obtained in frontline demonstration of the district, the yield gaps in percentage was upto 56% (Table no. 4.4). This is only because of poor management, which can be improved. It is possible to increase yield by improved management practices. Yield gaps are maximum in Kh. Jowar, Mung, Bajra, wheat, and tur comparatively minimum in cotton, R. Jowar and safflower (Table-). To bridge the yield gaps (1) there is a need to increase the irrigated area, (2) watershed development work should also be completed as early as possible on all area and then (3) it is essential to improve the agricultural services (Availability of inputs, Training to the Farmers, Research & Extension activities, Marketing, Transport, Storage, Processing etc.). Restoring soil health is a prerequisite.

Growth rates required to achieve the yield obtained in frontline demonstration is shown in table. It is possible to improve the productivity of crop with the growth rate of 6 to 10 percent per year under improved agricultural services. Growth rates of different crops are at lower side. But, this can be improved by adoption of better Management practices.

TABLE NO. 4.5
YIELD GAP ANALYSIS (2011 – 13) PARBHANI

SR. NO.	Name of Crop.	Average yield in district (kg/ha)	Av. Yield in frontline demonstration. (kg/ha)	Yield gap (%) With respect To FLD.	Growth rate (%/year) required to achieve equal to frontline demo.
1	Paddy	479	825	-42	11.49
2	K. Jowar	985	1925	-49	14.34
3	Tur	416	950	-56	17.96
4	Mung	283	525	-46	13.16
5	Soybean	939	1500	-37	9.82
6	Sugarcane	58000	85000	-32	7.94
7	Cotton	257 Lint	340 Lint	-24	5.76
8	R. Jowar	95	1215	-19	4.29
9	Wheat	1138	2200	-48	14.09
10	Gram	653	925	-29	7.21
11	Safflower	608	815	-25	6.04
12	R. Sunflower	568	815	-30	7.49

IRRIGATED AREA:

The total source wise irrigated area of the district is 217048 ha., which is 31.18 percent of total cropped area. Maximum irrigated area occurs in Purna Tahsil (37818 ha. (45.83%)) while minimum irrigated area in Selu Tahsil (4979 ha. (4.71%)). Major source of irrigation in this district is tanks through, which maximum area is irrigated (163491 ha. (75.32%)) followed by open wells (44133 ha. (20.33%)). It is well known fact that crop yield increases under irrigated condition. It is possible to take 2 to 3 crops per year on the same piece of land one after another. Hence, it is proposed to increase the irrigated area upto maximum possible limit, as early as possible.

Irrigated are can be increased by 50% or so if modern methods of irrigation such as drip or sprinkles are used. It is also suggested that necessary arrangements for improved on farms surface irrigation methods be made.

CROPS AND CROPPING SYSTEMS IN IRRIGATED AREA:

Irrigation in Parbhani District is 217048 ha, Wheat, Sweet orange, Sugarcane, Cotton are the major crops grown under irrigated conditions. Crop yields are higher under irrigated condition. Land utilization efficiency increases due to irrigation and hence, it is suggested to increase irrigated area. Irrigated area can be increased by constructing minor, medium or major irrigation projects as early as possible and wells in untapped ground water areas considering the availability of rainwater. Irrigated area can also be increased up to 20%-25% (of treated area) by integrated Watershed Development Work.

After construction of irrigation projects and integrated watershed development work, it is expected that irrigated area will increase of gross cropped area in Parbhani District.

TABLE NO. 4.6
TALUKA-WISE IRRIGATED AREA (IRRIGATION POTENTIAL)

Sr. No.	Taluka	Total cropped Area (ha.)	Irrigated Area (ha.)	% Irrigated Area to total cropped area
1	Parbhani	145764	47304	32.45
2	Purna	82504	37818	45.83
3	Palam	61139	7422	12.13
4	Gangakhed	11041	44843	40.61
5	Sonpethr			
6	Selu	10568	4979	4.71
7	Pathri	105958	51168	48.27
8	Manvat			
9	Jintur	84527	17734	20.98
	Total District.	**696013**	**217048**	**31.18**

TABLE 4.7
SOURCE WISE IRRIGATED AREA

Sr.no.	Source	Irrigated area (ha)	Percentage of total irrigated area
1	Tanks	163491	75.32
2	Open Wells	44133	20.33
3	Tube/bore wells	5780	2.66
4	Lift Irrigation	3644	1.68
	Other sources		
	Total	**217048**	**100.00**

The crops which generate higher monetary return should be preferred in irrigated area. The irrigation water is not available for all the area for all the crops in the district. It means water is a limiting input. In this situation our aim should be to harvest more yield per unit of water. Awareness amongst the farmers in this regard should be created so that, they should try to convert the irrigation water into more agricultural production and ultimately higher monetary returns. At present, most of

the farmers, prefer sugarcane crop. Sugarcane requires about 1600mm of irrigation water i.e. 16000 m^3 water for one hectare area. If same quantity of water is used for chilli crop, more than 2 ha. area can be irrigated or if it is used for onion, it is possible to irrigate three hectares of area and the total monetary return of chillies or onion will be much higher as compared to sugarcane. This concept needs to be explained to all farmers in training programmes.

Sweet orange is also important cash crop in this area which requires less quantity of irrigation water (1200mm i.e. 12000m^3 per ha. per year) as compared to sugarcane. Area under this crop should be increased under judicious water management.

Area of cotton in this district is maximum i.e. 179100 ha. but only 15.0% area is irrigated. Proportion of rainfed area is maximum hence the average yield is only 257 kg / ha of lint (735 kg / ha of seed cotton). Priority should be given to this crop for irrigation because it gives much higher yield under irrigated condition as compared to other crops. Cotton is a two seasonal crop (duration is 170-180 days) maximum growth period occurs in rainy season, hence irrigation requirement of cotton in this area is only about 250mm, it means only two irrigations are required. Under irrigated conditions, it is possible to harvest more than 30-40 q/ha of seed cotton. Hence, it is suggested that area under irrigated cotton should be increased. Same policy should also be adopted for tur, in which by giving one or two protective irrigations after rainy season i.e. at flowering and at pod development stage increases yield from 7 q/ha to more than 25 q/ha.

Table 4.8
Proportion of irrigated area in different crops

Sr. No.	Crops	Total area of crop (ha)	Irrigated area (ha)	% irrigated area
1	Cotton	206800	31000	15.0
2	Tur	51000	4100	8.0
3	Rice	9300	1400	15.1
4	Maize	1300	500	38.5
5	Kh. Jowar	102200	0	0.0
6	Soybean	66000	0	0.0
7	R. Jowar	153800	38500	25.0
8	Wheat	35300	35300	100.0
9	Gram	44900	9000	20.0
10	Safflower	32800	4900	14.9
11	R. Sunflower	11400	700	6.1

Table 4.9
Effect of irrigation on crop yield

Sr. No.	Crop	Yield (kg/ha) In irrigated area	Yield (kg/ha) In rainfed area	% increase in yield
1	Rice	830	668	24.25
2	K. Maize	2160	1560	38.46
3	Tur	1325	740	79.05
4	Cotton	635 Lint	481 Lint	32.02
5	R. Jowar	1444	1046	38.05
6	Wheat	2036	892	128.25
7	R. maize	1850	1160	58.48
8	Gram	1230	745	65.10
9	Safflower	1060	717	47.84
10	R. sunflower	1125	776	44.97

Farmers of this area are prefer wheat crop, which is comparatively a sensitive crop for water stress and short winters. In case of wheat about 550mm of irrigation water is required to harvest maximum yield. There is drastic reduction in yield, if water supply is reduced. Hence, under scarcity situation it is suggested to take drought resistant crops like gram, sorghum, safflower which require less irrigation water and more area can be irrigated. The quantity of irrigation water, which is required for wheat, is sufficient to irrigate 2 to 2.5 ha of gram or sorghum and the total monetary return per unit of water is much higher in case of gram or rabi jowar. Therefore there is a need to increase the irrigated area of rabi jowar and gram, because yield response to irrigation water is good in both the crops.

4.6: INPUT MANAGEMENT :

To harvest maximum crop yields, it is expected that the farmers should use all inputs (pure seed of high yielding or hybrid variety, manures, fertilizer, irrigation water, pesticides, weediesides, growth regulators etc) as recommended by the experts. It is also expected that the farmers should complete all operations such as preparatory tillage operations, seed bed preparations, sowing, intercultural tillage operations, spraying, dusting etc. at a right time. But there are difficulties to the farmers. Irrigation facility is available only for 31.18 per cent area. Remaining 68.82 per cent area is rain fed on which watershed development work is not completed up till now. In this situation farmers are not ready to take risk for more inputs. There is a need to create confidence among cultivators. Adequate and timely credit facilities needs to be created.

SEEDS:

Use of pure seed of improved varieties is the basis of all agricultural improvement. "Reap as you sow" is a age old saying which is true in scientific farming also. No amount of advanced agricultural practices will boost up crop yield if the seed used is not of high quality. Good seed does not cost much but relatively it pays more. There are several varieties released in some of the crops like cotton maize but in some of the crops local varieties are used. Yield potentials are very low. More and continuous research is essential for increasing productively.

In crops like K. Jowar, Bajra, Maize, cotton the seed replacement rate is 100 per cent which can be considered as good sign of improvement but in case of Tur, Mung, Udid, Groundnut, soyabean, R. Jowar, wheat gram the seed replacement rate is very low. Rabi jowar is grown on large area but the seed replacement rate is only 20 per cent. in such cases farmers are using local seeds without seed treatment which may or may not be of good quality seeds. There should be provision of seed testing in laboratory.

ORGANIC MANURES:

Integrated approach for nutrient management is suggested by the scientist but it is observed that, most of the farmers are using only chemical fertilizers and they are not using organic inputs because of unavailability at local level. Organic manure is a complete food for the crops. All nutrients (including micro nutrients) are available in manure. Farmer should produce organic manure, comport, vermicompost at their site.

FERTILIZERS:

Crop wise NPK consumption shows that in cotton, sugarcane, wheat and maize, the farmers of this district are using NPK almost equal to recommended dose per hectare, even though the yield of wheat and sugarcane are not satisfactory when it is compared with expected yields. This is because farmers are not adopting the principles of integrated nutrient management.

It is also observed that they are not using balanced fertilizers. In case of Tur, Mung, Udid and Soyabean nitrogen is used as recommended dose but p_2o_5 is not used in sufficient quantity. In most of the cases, bio fertilizers are not used which is very essential to harvest higher yield.

All type of fertilizers (straight fertilizers, complex fertilizers, micro-nutrients, liquid fertilizers should be made available to the farmers. The requirement of micronutrient to the crop is comparatively low but it is equally important as major nutrients. Liquid fertilizers are more useful and efficient in drip and sprinkler irrigation systems.

CHEMICALS:

Different type of pesticides, weedicides, growth regulators are required in crop production programme. Chemicals should be standard and of best quality. Pesticides are required to protect the crop. There should be provision of testing of chemicals in laboratory of Agro polyclinic.

LABOURS:

Human labours and bullock labours are not available in adequate number. At many places it is observed that the farm operations like preparatory tillage, land layouts, sowing, intercultural operations, spraying, irrigation, harvesting etc. are not completed in time, which adversely affect the crop yield. Load shading of electricity has also become a serious problem. When labours are available for irrigation, during daytime, the electricity is not available and when electricity is available during night time, labours are not available.

Number of marginal farmers, small farmers are more in number. They can not afford to keep a bullock pair, they can not afford to buy a tractor, they are unable to complete the farm operations. In this situation is very essential to shift to mechanization hence a proposal is given separately.

TABLE 4.10
Planning of Agriculture inputs in the District – seed 2012 - 13

Sr. No.	Name of crop	Area under crop (ha)		Present SRR %
1	2	3	4	5
	Kharif			
1	Jawar	1012	581	100
2	Tur	564	665	25
3	Soyabean	290	722	100
4	Cotton	1964	1885	100
5	Mung	760	804	25
6	Udid	162	222	25
	Rabbi 2012 – 13			
1	Rabbi Jawar	1703	1514	20
2	Wheat	350	527	23
3	Maize	5	6	25
4	Gram	401	450	25
5	Safflower	366	329	35
6	Sunflower			

Table No. 4. 11
Cropwise NPK Consumption

Sr. No.	District	Major Crops	Fertilizer Consumption(kg/ha)			
			N	P	K	Total
1	Parbhani	Cotton	18850	9425	9425	37700
2		Jawar	4648	2324	2324	9296
3		Soyabean	2166	4332	2166	8664
4		Mung / Udid	. 6987	4326	3216	14529
5		Tur	1662	3325	0	4987
6		Sunflower	258	172	129	559
7		Wheat	5270	2635	2635	10540
8		Rice	508	202	202	912
9		Gram	1125	2250	0	3375
10		Banana	112	120	120	352
11		Sugar Cane	4552	2093	2093	8738
12		GrondNut	110	220	0	330
13		Sofflower	1964	1316	0	3280
14		Vegetable	50	40	30	120
15		Hort. Crops	30538	32920		63458
16			78800	65700	12340	166840
	Total		157600	131400	3468	333680

TABLE 4.12
PLANNING OF FERTILILSER REQUIREMENT

Sr. No.	Taluka	Fertiliser Grade	Use of Fertilizer (tonnes) During 2006-07	2012 - 13	2013 - 14	2014 - 15	2015 - 16	2016 – 17
1	Parbhani	Urea	37023	75000	80000	85000	90000	95000
2		DAP	17485	15000	20000	25000	25000	30000
3		Mop	3143	18000	20000	21000	23000	25000
4		SSP	11177	10000	11000	11050	11500	12000
5		Complex	25063	102800	103000	104000	105000	106000
6		Mix. Ferti.	13085	14600	15000	15025	15050	15100
	Total		1 06976	235400	249000	261075	269550	283100

4.7 FARM MECHANIZATION/FARM EQUIPMENTS

Farm operations are the most drudgery, difficult and laborious work in crop production programme. If appropriate type of implement/tool/machinery is available, the farm work can be completed in short time and the quality of work is also good. Because of comfort to agricultural workers, it improves efficiency and reduces labour cost. Farm mechanization increases profitability.

Women play a major role in crop production and post-harvest activities related to agriculture, horticulture dairy; poultry etc. Women are involved in large number of agricultural operations including sowing, planting, weeding, hoeing, fertilizer application, spraying, dusting, harvesting, threshing, grading, processing etc. If women-friendly tools, implements machineries are available it improves efficiency of working.

In Parbhani district, availability of farm implements, machineries are studied and it is observed that farm implements/machineries are at lower (table 4.13) level. Number of tractors, seed drills, sprayers, threshers, Ele. Pumps, drip and sprinkler setts were studied. It shows that highest number of tractors (274) were in the area of Manvat, pathri tahsil, indicating 244 ha of cropped area per tractor whereas lowest number of tractors were in Parbhani taluka indicating 1695 ha of cropped area per tractor. By considering the cropped area of different Tahsils the number of seed drills, Elc. Pumps, sets of drip and sprinklers, sprayers are at lower level. Number of threshers were more in the area of Gangakhed-Sonpeth tahsil.

The staff of SRTMRI Aurangabad has discussed the issue of mechanization with farmers of Parbhani district and it is reported by the several farmers that there is shortage of farm labours. This is a serious problem. Therefore it is very essential to switch on to farm mechanization. Considering the requirement, it is proposed to have an organization at district place to manufacture & repair different types of tools, implements, equipments, machineries etc. The organization may be Govt., co-operation or private but they should be involved in research, manufacture and sale of tools, implements, machineries required for crop production programme and post-harvest activities. More labours are required for transplanting of seedlings, planting of sugarcanes, harvesting of Jowar, Maize, Picking of cotton, harvesting of Wheat, safflower, grading of sweet orange etc. The use of equipment, machineries should reduce the labour requirement. The machineries required for post harvest activities may also be given more priority.

The Lead Bank and Land Development Bank should provide adequate investment credit, reasonable rate of interest, to the cultivators, for the purchase of tractors, electric pumps and other farm machinery, to improve their productivity. Taluka-wise projected investment credit for XI plan period is shown in table. (See Vol. III Table 29)

Table 4.13
Availability of Improved Farm Equipments and Machineries

Sr. No.	Taluka	Tractor		Thresher	
		No.	Area/ Tractor (ha)	No.	Area /The. (ha)
1	Parbhani	86	1695	23	6338
2	Purna	120	688	27	3056
3	Palam	82	746	12	5095
4	Gangakhed	132	480	30	2567
5	Sonpeth	98	480	13	2567
6	Selu	272	389	39	2710
7	Manvat	118	244	16	3212
8	Pathri	156	244	17	3212
9	Jintur	278	304	29	2915
Total Dist.		**1342**	**519**	**206**	**3379**

4.8 SPECIAL PROJECTS/PROGRAMMES ON-GOING IN THE DISTRICT:

Reduced public investment in agriculture and allied sectors during last decade has resulted in decline in growth rate of agriculture. Therefore, there is an urgent need of enhancing investment in agriculture (both public and private) to augment productive capacity. As public extension system empowers farmers technologically and economically, it need be adequately backed by public finance.

Large numbers of schemes and projects sponsored both by the central and State Governments are implemented and operational in each district. There is need to network and co-ordinate these schemes/projects to empower farmers for enhancing agricultural productivity through resource use efficiency.

Major schemes implemented at district level are:

Agriculture:

1. Integrated cereal development.
2 Rapid maize development
3. National pulse development.
4. National Oil-seed production.
5. Sugarcane development.
6. Integrated cotton development
7. Seed quality testing.
8 Fertilizer and Pesticide residue analysis.

Horticulture:

9. Employment Linked Horticulture development.
10. Mango Plantation Scheme.
11 Rice based fruit planting.
12 Inter cropping of spices in coconut.
13. Nursery Management.
14. Micro irrigation system.
15 Tribal farmers horticulture development.

16 Pomegranate Oily-disease management.
17 National Bamboo Mission.
18 National Horticulture Mission (NHM)
19. Sanitation and phyto-sanitary certification.

Soil and water conservation:

20. National Watershed development.
21. River-Vally Project.
22. Farmers participation in national programme of soil and water conservation.
23. Saline & Sodic Soil development
24. Western Ghat development.
25. Organic farming
26 Vidharbha Special Package programme.

Extension:

27 Gender sensitization and participation.
28 Information support to agril. extension.
29. Soil, Water, testing.
30 Bio-pesticide production
31 State extension reforms (ATMA)
32 Natural disaster management.
33. National Agril Insurance.
34. Agri-polyclinics and farmers training.
35 Shetkari Magazines and publication.
36 Awards and incentivization scheme.

State has launched Maharashtra Agril Productivity Improvement Campgin (MAHAPIC) for enhancing productivity of major crops by effective networking, convergence and co-ordination of various schemes at district level. The Major components of various schemes/projects are:

1. Quality seed/planting material supply.
2. Promotion of village seed movement
3. Training of field extension staff.
4. Training of farmers/groups.
5. Field frontline demonstrations.
6. Promotion of IPM, INM, ICM
7. Supply of critical inputs
8. Gender sensitization.
9. Exposure visits of farmer within and outside country
10. Farmers Field schools
11. Publications, information support and awareness programme.

4.9: Constraint Analysis:

4.9.1 Yield gap analysis of major crops:

Average yield of different crops in Parbhani district, yield obtained in frontline demonstration and yield gaps are shown in table 4.4 Yield gaps are more (more than 40 per cent) in kh-jowar, Paddy, cotton, mung, udid, tur and Wheat where as yield gaps are less (less than 20 per cent) in R. Jowar, The yield gaps are mainly because of poor management. The reasons for yield gaps are shown in Table 4.10

Table – 4.14
Reasons for yield gaps

Sr. No.	Crop	Main reasons for yield gaps
1	Cotton	1. About 94% cotton area is rainfed, low moisture at boll development stage. 2. Not adopting the principles of INM. 3. Poor plant protection measures. 4. Crop is also grown on shallow coarse textured soils.
2	Maize	1. Not adopting the principles of INM. 2. Crop is also grown on shallow soils. 3. Deficit soil moisture. 4. Poor plant population.
3	R. Jowar	1. Needs irrigation at critical growth stages. 2. Seed replacement rate is very poor. 3. High yielding varieties are not available 4. Poor irrigation layouts.
4	Bajra	1. Poor intercultural operation 2. Poor nutrient management
5	Tur	1. Needs irrigation at flowering & pod development stage. 2. Seed replacement rate is poor. 3. Not adopting the principles of IPM 4. Insitu moisture conservation techniques needs to be adopted.
6	Mung, Udid	1. High yielding varieties are not available 2. Seed replacement rate is poor. 3. Poor or no plant protection measures 4. Late sowing due to insufficient moisture.
7	Soyabean	1. Poor seed replacement rate 2. Poor nutrient management 3. Poor intercultural operation 4. Not adopting the principles of IPM.
8	Wheat	1. Late sowing, poor plant population. 2. Needs adequate number of irrigations 3. Varieties of higher yield potential are not available. 4. Seed replacement rate is poor. 5. Poor nutrient management.
9	Gram	1. Needs irrigation at critical growth stages, poor irrigation layouts. 2. Needs medium to deep soils only 3. Not adopting the principles of IPM
10	Sugarcane	1. Planting is not scientific 2. No seed treatment 3. Not adopting the principles of INM and IPM 4. Poor irrigation management.
11	Kh. Jowar	1. Late sowing because of low moisture in soil 2. Varieties of high yield ingential are not available 3. Poor intercultural operation 4. Not adopting the principles of INM and IPM
12	Safflower	1. High yielding varieties are not available 2. Poor or no plant protection measures.

4.9.2 EXTENSION & ADOPTION GAPS/LIMITATIONS:

Though extension services are essential ingredients in agriculture and rural development, there is a wide gap between scientific **know-how** and field level **do – how**. According to NSSO, Govt. of India (2005) report, only 40% of the farmers in the country accessed one or the other source for getting information related to modern forming while 60% farmers are unaware of modern agriculture technology. Further, the farmers who received farming related information from one or the other source, only about 50% actually tried the information or adopted the recommended technology indicating huge technology transfer (Extension) and adoption gaps. This gap being largest in live stock and fisheries sub-sectors which are emerging as an important contributors to the total agriculture GDP.

The huge technology unawareness, technology transfer and adoption gaps may be ascribed to: 1) In appropriate and non-attractiveness of technology package 2) Farmers unawareness of new and modern technology due to low literacy rate 3) Non-availability of modern technology related quality inputs at right time, in right quantity and at right and affordable cost. 4) Deteriorating terms and inadequate infrastructure for trade agriculture produce and 5) Ineffective agriculture extension services.

LIMITATIONS OF PUBLIC EXTENSION SYSTEM :

The size of existing extension service network in agriculture and allied sectors at district level is, by and large, satisfactory. Although the ATMA has been established for integration, co-ordination and convergence of extension efforts at the district, the perceived innovations in institutional reforms still face the implementation and operational linkage problems. Decentralization and participatory approach in extension delivery is a step in right direction. However the flow of appropriate technology, and value added information and combination of various supports services at right time and place to empower small and marginal formers for improving efficiency and viability of farming is in effective due to lack of sensitization, orientation and capacity building of field extension personnel of line departments and bottom level decision makers, The evidences of impact of ATMA module of extension delivery on small and marginal holdings and other disadvantaged group of farmers and farm women, which constitute huge number and preeminent for food and social security of the rural communities, are hardly visible. The key limitations of district extension system are:

- Public extension services are widely viewed as supply driven rather than demand-driven.
- There is more focus on input distribution and subsidy administration rather than core function of farmer's empowerment through credible extension work.
- Segmented approach in extension service delivery without considering farmers interests and priorities.
- Public extension deals with a large area and population with diverse cropping pattern and extension services are general in nature.
- Poor networking and weak co-ordination in district line departments.
- In inadequate capacity building/skill up gradation of extension workers to provide demand-driven, specialized, location specific extension services.

- Due to large vacant posts, deployment of extension workers to other supervisory work, and constraints on budgetary allocation, the public extension system is not able to effectively perform its extension services.
- Weak and / or non-existence of research – extension – farmer – market linkages.

4.9.4 EXISTING INSTITUTIONAL MECHANISM IN THE GOVT.

Besides deficits in public investment, credit, infrastructure and market economy, the "knowledge deficit" is the primary cause for the "development deficit" in agriculture and rural economy. The gap between scientific know-how and the field level do-how has been widening in recent years. This knowledge deficit need to over come speedily and effectively through efficient and accountable Agriculture extension machinery to enhance productivity, profitability and viability of farming, specially of small and marginal holdings.

EVOLUTION OF PUBLIC EXTENSION SYSTEM IN STATE

Public Extension System has undergone several changes since early 1950. Beginning with Community Development (CD) programme in 1952 through the National Extension Service in 1953, the main focus was on human and community development. There has been a steady progression towards technology transfer, with IADP in 1961-62, IAAP in 1964-65, HYVP and FTEP in 1966-67, and SMFDP in 1969-70.

The most significant development was the introduction of the Training and Visit (T&V) extension management system in mid 1970's. T&V extension system was well suited to rapid dissemination of broad based crop management practices and registered impressive gain in irrigated area. Indeed, the T&V system played an important role in ushering the Green Revolution. The various mechanisms evolved in T&V system were very successful in providing a two-way channel for dissemination of technology to farmers and the feed backs of the problems faced by the farmers to research system with better Research – Extension - Farmer (R-E-F) linkages.

However, the T & V system being "Top-down" in approach generated uniformity rather than specificity with low level of involvement of farmers. The capacity building of extension functionaries and farmers was not adequately addressed and mostly remained with centralized operations. During post-green revolution period, when the T&V extension approach was extended to rainfed farming, the system failed to respond to the more location specific, risk-prone situation in sustainable manner. The system did not meet with success, the needs of diversified agriculture in rainfed area. Further due to closure of the World – Bank support to T&V extension approach, the R-E-F Linkages considerably weakened.

The state Department of Agriculture was reorganized in 1998 on "one window" pattern with a view to deploy more of its technical manpower in the field for implementation of various agricultural development programmes and to provide agro-technical services to farmers through single village level worker (VLW). This was a broad based extension model but lacked functional integration and the staff was equipped with traditional managerial skill of input supply, quality control with poor awareness about changing needs of farmers. This field staff is heavily burden with

various schemes/protects and targets with very less emphasis on technology transfer and technology application in real-life field situation of farmers.

PRESENT EXTENSION SERVICES

1. GOVERNMENT SECTOR

The Department of Agriculture of the state is the nodal agency for insuring overall development and growth of agriculture. At the district level, the Department of Agriculture is headed by Superintendent Agriculture Officer (DSAO) assisted by Deputy Director of Agriculture (DDA), Sub-Divisional Agriculture Officers (SAO), Taluka Agriculture Officers (TAO), Circle/Mandal Agriculture Officer (CAO), Agriculture Supervisors (AS), and Agriculture Assistants/Village Level Worker (VLW). The main responsibilities of Agriculture Department are:

- Implementation of various central and state sponsored schemes.
- Transfer of Technology and
- Providing other technical services

Department of Agriculture assists in transferring the latest agriculture technologies developed by SAU, ICAR and other Research organizations to the farm families through farmer's field school, village seed programme, field demonstrations, kisan melas, training of farmers, direct contact, literature and print and electronic media. The department has introduced Krishi Viyan Mandals (KVM) and Self Help Groups (SHGs) for participatory extension services.

The district line Departments of the state Govt. such as Horticulture, Animal Husbandry, Dairy Development, Sericulture, Forestry, Fisheries etc are involved in providing extension services through supply of subsidized inputs and routine technical messages through seminar, workshops, demonstration, field visits, exhibitions, etc. Besides they implement various central and state sponsored schemes of the respective departments.

Apart from Agriculture and other Line departments, the Zilla Parishad (ZP) also has the department of Agriculture headed by Agriculture Development Officer (ADO) assisted by supporting staff at District Parishad and taluka and village Panchayats. They are mainly engaged in input supply and distribution, and quality control besides Extension services.

Following State Govt. setup corporations are mainly responsible for production, supply and procurement of inputs along with products related extension services in the district.

a) MAIDC Ltd. b) MSSC Ltd. and c) M.S. Seed certification Agency.

Agriculture University Extension Services in the district covers. The organization of zonal Agri. Res and Extension Advisory committee meetings, monthly district workshops, Diagnostic team visits, joint field visits, demonstrations, trainings of extension personnel's and farmers mainly through Krishi Viyan Kendra's, ZRS/sub-stations and District Extension Agronomist with a team of subject matter specialists.

Krishi Viyan Kendra's (KVK) mandate is technology assessment and refinement through On Farm Testing (OFT) and Front Line Demonstrations (FLD) of improved technology /products and its dissemination through training of extension personnel's and farmers, and vocational training of rural youths and farm women. The Programme Coordinator (PC) as the head of KVK plans and implements tailor-made extension programmes based on thrust areas of the district. The PC of the KVK is assisted by six Training Associates of major disciplines and three Training Assistants and supporting staff. The scientific Advisory Committee (SAC) of the KVK comprised of district heads of various line Departments, progressive farmers and KVK/SAU scientists meet twice in a year to review the progress of the work and discuss the future plan of work. The success of KVK largely depends on its strong linkages with line departments and contact farmers.

2. CORPORATE/PRIVATE/NGOS SECTOR

Increasing restraints on Govt. finances and new arrangement in extension services, the corporate, private and large number of NGOs/ agencies are increasingly involved in providing technical and materialistic extension services in the district. The corporate houses, private wholesale dealers, retailers, traders are mainly involved in farm business through consultants and agri-business outlets. The major corporate players, which have already come up with their Agri-products are "e - chaupal" of ITC, "Aadhar" of Godrej Agro-vet, Shub Labh of Mahindra Group, Tata Krishi Seva Kendra of TATA Group etc. Most of these outlets are offering Agri-inputs at a single window and agricultural extension services related to their brand products. Some of the sugar mills in the district have also adopted the innovative method of agro-extension.

The farmer's organizations (KVMs, SHGs) and NGOs largely dependent on Govt. grants/subsidies are also providing extension services in the district through participatory mode. The NGOs are mostly involved in promotion and credit linkages of SHGs, watershed development, organic farming, rain water harvesting, rural sanitation and health awareness etc. These private groups of extension agents are giving services free to nominal charges.

INNOVATIONS IN TECHNOLOGY DISSEMINATION:

With a view to increase the quality of public extension system to face the challenges of 21st century, it was necessary to evolve new strategies for effectively disseminating newer technologies being evolved by the NARS. As reforms in the present public extension system, an Agriculture Technology Management Agency (ATMA) was established and pilot-tested in four districts of the state during 10th four year plan. The main aim of ATMA is to integrate the various stakeholders at district level associated and involved with agriculture development activities within district. Based on experiences gained through pilot testing, the ATMA module of Extension delivery has been adopted in all the district of the state in the 12th plan.

The details of extension services provided by various line departments are given in table – 4.11 and the structure of Agri-extension services at district level is given in table – 4.12

Table no 4.15
Agriculture Extension Services Provided by Various District Line Departments

Sr. No.	Name of Department	Extension Services Provided
1	Agriculture Department	Transfer of latest agriculture technologies developed by SAU/ICAR/other research organizations through training of farmers, farmers' field schools. In-service training of field extension staff, organization of district monthly workshop, diagnostic team/joint field visits to identify specific technological problems of the district. Conduct-of demonstration, farmer rallies, publication of extensions literature, use of print, electronic media for wide spread of technological messages to reach maximum member of farmers.
2	Horticulture Department	EGS Linked horticulture development, NHM schemes for increasing area under horticulture crops, Assistance for setting green/poly houses, shed net, nursery development, encourages use of micro-irrigation like drip and sprinkler, fruit and vegetable processing. Transfer of horticultural technology through training, literature, and various mass media.
3	Animal Husbandry Dept.	Services like artificial insemination, castration, vaccination, medical treatment and parasitic control measures. Undertakes extension activities like mass training, cattle exhibition/melawa distribution of improved breeds of cow, goat and poultry units, feeds etc. implementation of self employment schemes for educated unemployed youths and Adarsh village programme.
4	Sericulture Dept.	Training of farmers, supply of planting material, disease free laying (DFL) at subsidy rate, purchase of Cocoons from farmers, provide subsidy for plantation of mulberry under EGS, publication of Extension Literature.
5	Social Forestry Dept.	Kisan Nursery, village economic development programme and imparting training to farmers in joint forest protection and management soil water conservation etc.
6	Department of Fisheries	Operates various schemes of providing technical guidance to district Fisherman's with respect to prawn & fish seed, nets and equipments on subsided rates. Financial assistance to fishermen co-operative society, construction of Fish pond, intensive Fish culture, Training to employed youth and Fish farmers.

Table no. 4.16
STRUCTURE OF AGRI. EXTENSION SERVICES

S.No.	Government	Corporate	Private	NGO
1	Channels • Agri. and Line Depts. • SAU, ZRS, RES Stations • KVK's	- e- Kiosk - IT centers - Agri-business outlets	- Traders -Input Dealers -Whole sale/retail shops	-Direct contact - Programme specific approach
2	Modes • Training, FFS demonstration plots, • Field visits, Kisan Mela. • Print/electronic media. • Audio-visual publicity.	- Marketing personnel - Print/electronic media - Direct contact through Agri-business outlets	- Direct contact - Advertisements	-Extension personnel - Training Institutes
3	Subject Matter of Extension • Efficient Input use • Production Practices • Management Technology • Crops/cropping pattern • Plant-protection • Post harvest management/processing	- Literature on Technology - Marketing arrangement - Product/Brand awareness, pesticides, fertilizers, implements etc.	- Product/Brand awareness, pesticides, fertilizers, implements, equipments.	- Efficient input use - Production Technology - Crops/Varieties - Cropping patterns etc.
4	Beneficiaries • Farmers, youths • Farm women • Input providers	- Farmers and entrepreneurs	-Farmers, entrepreneurs	-Farmers, entrepreneurs
5	Charges to Service users • Mostly free, logistic support to outstation visits	- Nominal charges	- Free	-Nominal charges

4.9.5 ANALYSIS OF VARIOUS CATEGORIES OF FARMERS INCOME

The total gross value added (GVA) at constant prices (2004 - 2005) for the three years average (2009 – 10 to 2011 - 12) for Parbhani District was observed to be Rs. 157678.89 lakhs. Due to the implementation of the various projects / schemes / programmes in Parbhani district during the XIIth period the level of income or the gross value added. From 5 major sectors in projected to be Rs. 240339.55 lakhs. Indicating an annual compound growth rate (CGR) of 8.79%.

The distribution of this income among various categories of farmers in Parbhani district is presented in the following table.

Table No. 4.17
Income Analysis of various categories of Farmers (Parbhani)
Gross income from Agriculture and Allied sector

Size of Land Holding (ha.)	No. of Cultivator	% of Land Operated	2009 - 12 per house hold income Rs.	2016 - 17 per house hold Income in Rs.
0-1	132349	14.24	9826	14156
1-2	129678	33.97	22832	34802
2-4	76530	40.45	46568	66407
4-10	8212	9.68	88588	135028
10 -20	547	1.23	194233	296057
20 – above	57	0.43	241679	368376
Total	**395167**	**100.00**		

Rs. lakh

Total Gross value added	2009 - 12	2016 - 17	**Growth Rates**
	157678.89	240339.55	8.79%

(1) Average income per rural household (2009 - 12) = Rs. 45310
(2) Average income per rural household (2016 - 17) = Rs. 69063
(3) Compound Growth Rate = 8.79%

ALLOCATION OF INCOME:

As data relating to category wise cost of production and gross incomes from agriculture and allied sectors are not available. We have allocated total gross value added on the basis of proportion of land operated by each category of farmers in Parbhani district. For example in 2009 - 10 to 2010 - 11 period the total GVA of Parbhani district was Rs. 141238.89 Lakhs, while the land operated by the marginal farmers was only 5.3% total land operated. Hence the allocation of income to this categories of farmer would be 5.3% of total income or Rs. 7485 Lakhs, but the total no. of cultivators as marginal farmers was 89992, hence the average income per cultivator is estimated at Rs. 8318 by adopting the same methodology we have allocated gross value added to other categories of farmers on the basis of proportion of land operated by which category farmers for both the period i.e. 2009 - 10 to 2010 - 11 (initial years) and 2011-12 final years of the XII Plan. Following conclusions may be drawn from this table.

1) All categories of farmers have benefited from the income originating in agriculture and allied sector. During the XI Plan period in Parbhani District. i. e. marginal, small, semi medium, medium and large farmers.
2) Considering all farmers together the average income of house hold has increased form Rs. 35741 in 2009 - 12to Rs. 55672 in 2016 - 17.

Limitation:

It is assumed that the productivity of land and labour is equal among all categories of cultivators. This is an important limitation of this analysis.

Table 4.18

Department wise New Schemes proposed Rs.in Lakhs (Stream-I

Stream - I

Table No - 31 Department Wise Production and Growth new schemes proposed

			(Rs. Lakh)			
No	Name of department	Scheme New / Ongoing	Year wise programme (Financial)			Total
			2014 - 15	2015 - 16	2016 - 17	
1	Agriculture	Special Exposure Visit at Rs 20 lakh per year/ district	0.00	20.00	20.00	40.00
2		Subcidy For Production of HYV Certified of Soybean.Mung,Tur,Udid	0.00	90.00	90.00	180.00
3		Eastabishment of HDPS Guava Plantataion	0.00	30.00	30.00	60.00
4		Increasing woman participation	0.00	5.00	8.00	13.00
5		Building Commodity groups and farmers organization	0.00	5.00	5.00	10.00
		Total	0.00	150.00	153.00	303.00

Table 4.19
Infrastructure and assest

No	Name of department	Scheme New / Ongoing	Year wise programme (Financial)			Total
			2014 - 15	2015 - 16	2016 - 17	
1	Agriculture	Seed Processing Unit.Rs.15 lakh per unit	0	45	45	90
2		Establishment of District Extension Education Center at Destric Head Quarter	0	40	40	80
3		Agriculutre mechanization	0	75	80	155
4		Processing of guava pulp	0	80	80	160
5		Broad Bed Furrow implement 100 per taluka	0	432	432	864
6		Processing of turmeric and other spices	0	40	45	85
7		Ripening chamber	0	50	70	120
8		Fram 30x30x3 m	0	300	300	600
9		Establishment of oil mill	0	100	100	200
10		Crop harvester (cottan, wheat)	0	250	290	540
11		Cold storage	0	100	120	220
12		Desilting of water bodies & maintenance of watershed works done by Agriculture Dept	0	150	200	350
13		Well recharging of farm wells	0	75	150	225
14		Mobile soil Testing Van	0	50	60	110
15		Soil helth Improvement Programe Through soil health card distribution	0	25	40	65
16		Adarsh sansad Gram Yojana		100	120	220
		Total	0	1912	2172	4084

4.11: PROJECTED OUTCOME AND GROWTH RATE DURING THE PLAN PERIOD

PROPOSED GROWTH RATES:

In case of Kharif jowar the productivity is increasing and the area is decreasing, as a result the growth rate of production is slowed down. Average yield of districts when it is compared with average yield obtained in frontline demonstration, the yield gap is 49 percent. This indicates that there is a considerable scope to increase the productivity by improving the management practices. To reduce the risk, this crop should be grown in inter-cropping system. Considering the response of present varieties to manures, fertilizers, irrigation and other management practices, it is possible to improve the productivity with the minimum growth rate of 5- 6 percent.

Cotton is most important cash crop of this area. Area under this crop is maximum. Now B.T. varieties are used for cultivation, hence there is no attack of boll worms. Productivity is increased in rainfed and in irrigated area. In future also the productivity will increase with the same growth rate of about 8 percent because more useful information on plant density, nutrient management, irrigation and plant protection, based upon research experiments will be available to farmers.

Among pulses, tur, mung and udid are the major crops. Tur is a two seasonal crop having 170 days duration. This crop is sown in last week of June or First week of July. At the end of rainy season i.e. 90 to 100 days after sowing flowering starts in this crop. Because of low moisture in soil, there is shedding of flowers. It reduces the number of pods and finally the yield is low in rainfed situation. This crop responds very wells to improved crop management practices under irrigated condition. There is considerable scope for its improvement in productivity. The yield gap is 56 percent. Considering improvement in management practices and agricultural services the growth rate is proposed at a minimum 8 percent per annum. Growth rate is also proposed for Mung and Udid as 4 to 5%. These are short duration crops. Irrigation is not required in normal situation. There is scope to improve their productivity.

Soybean is important oilseed crop of this area. Productivity is also better. Yield gap is only -37 percent. The growth rate which is required to achieve the productivity, which is obtained in frontline demonstration is 9.82 percent. There is a scope to improve the productivity of soybean. The productivity can be more than the productivity obtained in frontline demonstration. Hence, minimum growth rate is proposed as 6 percent.

In rabi season, the major crops are Jowar, Wheat and Gram. Rabi Jawar is grown on stored soil moisture. The stored moisture is only about 30 to 45 percent of total water requirement of Jowar and hence the yield is low. This can be improved by irrigation, nutrient management and timely intercultural operations. The area under rabi Jowar is more. If there is slight improvement in management there can be considerable increase in yield. The irrigated area of jowar will increase in future. Hence, the growth rate of rabi jowar is proposed as 4.0 percent. Situation of gram is better. Productivity is high under irrigated condition. In addition to this, high yielding varieties of gram are released recently. These varieties under irrigated conditions will help in improving productivity. Hence, growth rate is proposed as 7.0 percent for gram. Wheat is important crop in irrigated area. Farmers are also giving priority to wheat if irrigation water is available. Several time it is observed that there is no sever pest in case of wheat, which reduces the risk in cultivation and if irrigation water is

available in adequate quantity, the productivity is higher. In future, it is possible to increase irrigated area and hence growth rate is proposed as 6.0 percent.

Sugarcane is important irrigated crop. Maximum amount of irrigation water is used to this crop. Area under this crop is about 13000 ha in Parbhani District and average yield is only 58 ton/ha. Average yield of this crop was 110 ton in 1960-61, which has decreased as farmers are not adopting the concept of integrated nutrient management, improved irrigation management and soil health including self management, productivity is low. This can be improved, hence growth rate is proposed as 7.0 percent.

TABLE NO. 4.20
PROPOSED GROWTH RATES FOR PRODUCTIVITY OF MAJOR CROPS

Sr. No.	Crops	Trend Growth Rate during last 9 years %	Proposed growth rates per year
1	Paddy	-2.9	3.24
2	K. Jowar	-1.74	5.37
3	Tur	0.54	8.51
4	Mung	6.13	4.90
5	Udid	5.07	4.67
6	Soyabean	-0.47	6.26
7	Sugarcane	-	7.27
8	Cotton	9.58	7.74
9	R. Jowar	-	3.76
10	Wheat	-	5.74
11	Gram	-	7.13
12	Safflower	-	3.13
13	S. Gr. Nut	-	4.28
14	Bajra	-0.22	-
15	Sunflower	2.35	-

CROP DIVERSIFICATION PLAN AND PROJECTED OUTCOME:

In Parbhani District, the total cropped area is 696013 ha, out of which about 319700 (45.9%) ha area is under cereal crops. Among cereals, Kh. Jowar, Bajra, Maize, Rabi Jowar and Wheat are the major crops. Kharif Jowar is an important crop but it is not much economically profitable. This crop faces problems like, in the event of late sowing (after 1st July) the crop is severely affected by shoot fly, steam borer,

which becomes very difficult to control. This crop also suffers, because of grain mould due to September rains, causing deterioration in quality and hence fetches low price, due to such constraint the area under sorghum is reduced.

Bajra is predominant Kharif crop of this area. Area under this crop is 8500 ha under scarcity situation, the productivity is higher, this crop can be grown on coarse textured slrallow soils, but this crop is also not much profitable to the farmers.

Rabi Jowar is most important cereal crop of the district, which meets the requirement of both grain and fodder. The area under this crop is 170900 ha even a small increase in productivity can lead to significant rise in production. At present productivity of this crop is low because of mostly rainfed area. Rabi Jowar is grown on residual moisture. Local varieties are used. Seed replacement rate is very low and farmers are not adopting improved agricultural technology. There is scope to improve the productivity of this crop by enhancing the area under irrigation, use of improved varieties and by increasing the seed replacement rate and by adopting insitu moisture conservation technologies on large area. Wheat is grown on 46400 ha with a productivity of 1138 kg/ha. The climate is not ideal for growing wheat in this district, but there is low risk of pest as compared to other crops and therefore farmers are giving preference to this crop, hence there is no need to reduce the area but need to improve the productivity by seed replacement, fertilizer management and proper irrigation management.

Tur is important pulse crop and it is also suited to this rainfall pattern. Area under this crop is 52800 ha with the productivity of 416 kg/ha. The major constraints in increasing the productivity is rainfed area, use of local varieties, low seed replacement rate. There is scope to increase the productivity by providing. Protective irrigation, using high yielding varieties and by adopting improved agricultural practice. This crop may help to improve the growth rate.

Soybean is potential crop emerging as a star oilseed in this district. Area and productivity is increasing. There is scope to increase the productivity. This crop can help to maintain good soil fertility and hence it is proposed to increase the area by reducing the area of Kh. Jowar and Bajra. It is also suggested to increase the area under other oil seed crop like, groundnut, sunflower, safflower etc.

Cotton is most important cash crop of the district. Area under this crop is increasing. At present, area is 179100 ha with the productivity of 257 kg lint/ha. The productivity is very low because more than 85 percent area is rainfed. Very good varieties are available now, if cotton is grown under protective irrigation and ideal management, the yield potential is very high (35-40 q/ha). It is also observed that crop rotation is not followed, which increase the incidence of insect and diseases. It is also essential to adopt the principles of integrated nutrient management for optimum yield, in rainfed as well as irrigated condition. Now, it is proposed to increase the yield by increasing area under protective irrigation and by adopting improved agricultural practices.

Sugarcane is cash crop of prime importance. At present area under sugarcane is 13000 ha with average yield of 58 t/ha. The area under sugarcane in this district undergoes cyclical changes. It increases with availability of water, but when

production increases, farmer faces the problem of marketing and they get low prices. Most of the farmers always prefer to take sugarcane when irrigation water becomes available. But, it is highly essential to explain them to take fruit crops, vegetables, spices medicinal plants. Under scarcity area crops, which are giving more monetary return per unit of water that should be preferred. Sugarcane requires more amount of irrigation water. Improper management leads to water logging and soil salinity. Duration of this crop is also more. In comparison with sugarcane the vegetable crops like chillies, onion, tomato and potato can give more monetary return per unit or water. Hence, it is proposed to reduce the area of sugarcane or if it is not possible keep the area static and increase the productivity of sugarcane. There is a scope to increase the productivity upto potential yield of 300 ton/ha. Productivity can be increased by using high yielding varieties, improved planting method, adopting INM, using drip irrigation method and other improved agricultural technologies.

Considering above points, the area is proposed. GVA and growth rate are calculated.

Table 4.21
Area, Production and productivity of Major crops in the Parbhani district.

Area: 00 ha. , Production: M. T., Productivity: Kg./ha.

Sr. No.	Crops	2006-07 to 2010 - 11			2012-13			2013 - 14			2014 - 15			2015 -16			2016 - 17		
		Area (A)	Production (P)	Productivity (Y)	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Paddy	60	29	479	58	31	540	57	34	590	55	35	635	52	34	650	50	34	675
2	Kh. Jowar	825	813	985	790	845	1070	755	890	1180	710	919	1295	690	1001	1450	660	1056	1600
3	Bajra	85	57	670	80	58	720	78	60	770	75	60	805	72	59	830	70	59	850
4	Maize	42	39	922	35	36	1040	32	37	1150	30	38	1280	27	39	1450	24	41	1700
5	Tur	528	216	416	527	242	460	526	268	510	525	286	545	525	307	585	525	325	620
6	Mung	445	126	283	430	131	305	420	137	325	410	145	355	410	158	385	400	160	400
7	Udid	151	43	283	140	43	310	140	46	330	135	48	360	130	52	400	120	54	450
8	Sunflower	71	38	544	68	41	610	66	42	635	64	42	660	62	42	680	60	42	700
9	Soybean	660	620	939	670	670	1000	670	716	1070	680	768	1130	690	807	1170	700	840	1200
10	Til	43	6	143	41	7	165	40	8	195	38	8	220	36	9	260	35	11	300
11	Sugarcane	130	7540	58	130	8450	65	128	9600	75	128	9584	78	126	10332	82	126	10710	85
12	Cotton	1791	1326	257	1700	1505	310	1640	1640	350	1595	1777	340	1570	1861	415	1532	1925	440
13	R. Jowar	1704	1684	985	1675	1725	1030	1640	1804	2100	1600	1920	1200	1550	1984	1280	1500	2025	1350
14	Wheat	464	528	1138	460	561	1220	455	594	1305	455	935	1395	455	673	1480	450	698	1550
15	Gram	440	287	653	440	326	740	445	352	790	450	374	830	450	392	870	450	405	900
16	Safflower	335	204	608	300	210	700	300	225	750	250	229	790	290	236	815	280	238	850
17	R. Sunflower	114	65	568	95	56	590	70	43	610	70	44	625	65	42	640	60	39	650
18	Gr. Nut	60	90	1500	60	100	1670	60	103	1710	60	106	1770	60	109	1815	60	111	1850

Table 4.22
Gross value added from various crops at constant prices (2004 -2005)

Rs. in Lakhs

Sr. No.	Crops	Market Price Rs. / Ton	2009 – 10 to 2011 – 12	2012-13	2013 - 14	2014 - 15	2015 -16	2016 - 17
1	Paddy	4802	139	149	163	168	163	163
2	Kh. Jowar	5292	4302	4472	4710	4863	5297	5588
3	Bajra	4313	246	250	259	259	254	254
4	Maize	4281	167	154	158	163	167	175
5	Tur	20653	4461	4998	5535	5907	6340	6712
6	Mung	14732	1856	1930	2018	2136	2327	2357
7	Udid	13254	570	570	610	636	689	716
8	Sunflower	10442	397	428	439	439	439	439
9	Soybean	8082	5010	5414	5786	6206	6522	6788
10	Til	22385	134	156	179	179	201	246
11	Sugarcane	750	5655	6337	7200	7488	7749	8032
12	Cotton	19930	75506	85699	93386	101187	105970	109615
13	R. Jowar	8000	13472	13800	14432	15360	15872	16200
14	Wheat	6435	3397	3610	3822	4086	4330	4491
15	Gram	12332	3539	4020	4340	4612	4832	4994
16	Safflower	9802	1999	2058	2205	2244	2313	2332
17	R. Sunflower	10442	678	584	449	459	438	407
18	Gr. Nut	12682	1141	1268	1306	1344	1382	1407

Table 4.23
Gross value added from different categories and growth rates

(Rs. In Lakhs)

Sr. No.	Crop Categories	2009-10 to 2011-12	2016-17	Growth Rates (%/year)
1	Cercals	21723	26871	4.35
2	Pulses	10426	14779	7.23
3	Oilseeds	9359	11619	4.42
4	Cotton	5655	8032	7.27
5	Sugarcane	75506	109615	7.74
	Total	**122669**	**170916**	**6.86**

4.12 ISSUES FOR RESEARCH:

The following aspects need in depth research to achieve 4 percent or higher growth rates in agricultural production under changing climatic conditional.

1. Develop new genotypes that can tolerate water stress and high soil water conditions.
2. Develop heat and drought tolerance in genotypes.
3. Attempt conversion of C_3 type plants to C_4 type plants.
4. Develop new land use systems including agronomy practices and restoration of soil health.
5. Find out various measures of watershed management under varying climatic and topographic conditions.
6. Use and development of multi purpose live stock species and breeds.
7. Processing of agricultural produce with compatibility and in appropriate interface.
8. Studies on dynamics and diversity of insets, pathogen bacteria and virus.
9. Interrelationship of livelihood of farmers and fisherman visa-vis the small units.
10. Studies on demand and supping of commodities, prices, trade, regional and societal difference.
11. Quality of produce criteria determination
12. Enhance research on applications of short, medium and long range weather for casting system to reduce production risk.
13. Develop compendium of indigenous traditional knowledge and explore position of using it.
14. Institutionalisation of phonology of perennial crops as bio indicator of climatic change.
15. Determine the training needs of various level of officers.

CHAPTER - V
ALLIED AGRICULTURAL SECTORS

5.1 INTRODUCTION:

C-DAP of the district is aimed at enhancing the growth rate of Agriculture. Along with it other allied activities like, Sericulture, Horticulture, Animal Husbandry Fisheries, Watershed development, Agro-based rural development, food processing units, Development of Rural Industries, Agricultural Marketing and Agricultural credit have also been included in the project repot.

Critical Analysis of the available data/statistics and information was made to formulate the strategies and recommendations for enhancing the growth rate of Agriculture as well as of allied activities. Thus, by increasing the growth rate of allied activities to minimum level of 6 percent per annum, it is expected that the overall growth of Agriculture and Allied Activities together will help in achieving CGR to 4 percent during the 12th plan period.

5.2 DEVELOPMENT OF HORTICULTURE IN PARBHANI DISTRICT DURING 12TH FIVE YEAR PLAN:

NTRODUCTION :

In Parbhani district different tropical and sub tropical fruits and vegetables are grown successfully. Among the fruit crops banana, sweet orange and mango are important crops. Similarly among the vegetable crops in kharif and summer seasons the crops like chilli, brinjal, tomato, bhendi, beans cucurbits etc are grown. In rabi season onion, pea, leafy vegetables, cabbage, cauliflower, carrot, radish etc. crops are grown on commercial scale. The flower crops like rose, tube rose, gillardia, marigold, Jasmins are grown near the urban areas. The spices like turmeric, ginger, chilli, onion and garlic are important crops of the district grown in all the talukas. The irrigation facilities have been increased to a considerable extent due to completion of various major and medium irrigation projects and wells, tube wells, farm ponds etc. With the increase in area under irrigation the area under different horticultural crops is also increasing. There is considerable scope for the development of Horticulture in Parbhani district during 11th five year plant. The total production of horticultural crops can be increased by increasing the area as well as productivity of horticultural crops. The following are some important points to be considered during 12th five year plan.

DEVELOPMENT OF FRUIT CROPS :

In Parbhani district the area under banana and papaya is increasing where there is a good facility for irrigation. Banana is traditionally grown since a very long time in the district. At present the area under banana is 3200 ha with the productivity of 50 tonnes per hectare. During 12th plan the area can be increased upto 4000 ha and there is scope to increase the productivity upto 68 tonnes per hectare. Similarly the area under sweet orange is 4000 ha which can be expanded to 6200 ha and the productivity can be increased from 30 to 40 tonnes per hectares. Mango can be grown as irrigated as well as rainfed fruit crop in the district. At present it is grown on 4000 ha area and during the

12th plan it is proposed to increase the area upto 8500 ha. The productivity of mango can also be increased from 5 to 9 tonnes per hectare.

Among other crops sapota, mandarin orange, kagzi lime, guava, papaya, are grown under irrigated conditions. Awala, tamarind, custard apple, jambhul crops are grown under rainfed conditions. There is scope to increase the area to almost double and productivity to 50 to 70 per cent level by following proper cultural practices.

Thus from different fruit crops the production of 356715 tonnes of fruits is obtained in Parbhani district and during 11th plan it is proposed to increased this production to 841910 tonnes by increasing the area as well as productivity of fruit crops. At present the total area under fruit crops is 14875 ha which can be increased to 28145 ha during 11th five year plan. It means that the area under fruit crops will be increased to the extent of 100 per cent or will be doubled during the plan.

Nursery activities :

For the increase in area it is important to increase the production of planting material to meet out the increased demands of the farmers. There is always demand for quality material and with the limited facilities the nurseties are unable to produce the planting material in sufficient quantities. It is essential to strengthen the fruit nurseries. On strengthening of central nursery of the university, it would be possible to increase the production of grafts and seedlings, of different fruits crops which can be supplied to the State Government nurseries private nurseries and farmers of Marathwada region. At many nurseries the availability of good quality mother trees is a problem and due to non availability of mother trees it is not possible to produce the plant material in sufficient quantities. Therefore, the fruit nurseries should be strengthened at the initial stage by establishment of mother tree blocks. Then after establishment of mother tree block, another point is to have the root stock seedlings, in sufficient numbers. For raising the root stocks, it is essential to provide the seeds of root stocks in sufficient quantities. The mother trees and the root stock availability if increases then it would be possible to speed up the production of planting material.

Besides open propagation of the nursery plants it would be possible to undertake the production of plants under green house conditions continuously through out the year. Tissue culture of plants like Banana is also undertaken on large scale in the tissue culture laboratory of Agricultural University. Selection of planting material produced through tissue culture would be more adventitious for the farmers for increasing the productivity of plant like banana.

REJUVENATION OF OLD GARDEN :

The old gardens of mango, ber, sweet orange are many times less productive. The State Department of Agriculture has scheme for rejuvenation of old gardens. The old less productive plants having poor fruit quality are converted into superior quality plants with more vigour and productivity. In case of ber many trees have been already converted into superior types by following the patch or ring budding methods on new sprouts of the old cut trees.

Besides rejuvenation by grafting methods, the productivity of the plants can be increased by intensive nutrient management (INM) and intensive pest management (IPM). The plant growth regulators and other chemicals like bio enzymes can be used for increasing the productivity and quality of fruits. The chemicals are also useful in post harvest handling of the fruits.

DEVELOPMENT OF VEGETABLE CROPS :

In Parbhani district the cultivation of vegetable crops is more concentrated around the cities and towns as there is good demand for the vegetables in urban areas. The vegetables can be grown throughout the year as there is demand for the vegetables all the year round. In kharif season beans, cucubits, bhendi etc. vegetables are grown by the farmers and in rabi season cabbage, cauliflower, pea, carrot, chilli, tomato, brinjal etc. vegetables are grown. In Parbhani district the area under vegetables is 4688 hectares which can be increased to 9150 hectares during 11^{th} plan. The total production of vegetables in the district is estimated to be 42920 tonnes which can be increased to 133700 tonnes with a compounded growth rate of 26.3 per cent.

ORGANIC FARMING IN VEGETABLES :

There is more demand for the vegetables produced through organic farming. Partricularly the educated persons from urban areas are more health cautious and they prefer to consume the vegetables produced through organic farming. Therefore, a separate proposal on organic farming in vegetables has been prepared and is being submitted separately.

VEGETABLE SEED PRODUCTION :

With the increase in area under vegetables the demand for good quality seed material will also increase. In order to meet out the demands of seeds of different vegetables, it would be essential to undertake the vegetable seed production. The seed companies in the district should come forward for undertaking the seeds of different improved varieties of vegetables.

PRODUCTION OF SPICES :

In Parbhani district turmeric and chilli are the major spice crops grown in all the talukas. Ginger and garlic crops are also cultivated in the district. The total area of 2031 hectares is under spice crops which can be increased to 3920 hectares in 11^{th} plan. The total estimated production of spices to the extent of 12882 tonnes can be increased to 30962 tonnes during the 11^{th} five year plan with the growth rate of 19.2 per cent.

DEVELOPMENT OF FLORICULTURE INDUSTRY :

In Parbhani district the flower crops like aster, marigold, rose, tuberose, mogra etc. are grown on small scale on an area of 49 hectares with the production of 154 tonnes. During 11^{th} plan there is good scope to increase the area to 210 hectares and production to 2261 tonnes with the growth rate of 33.8 and 52.3 per cent respectively. There is good demand for the flowers through out the year in urban areas. Therefore, around towns and cities the flower production and floriculture industry is growing very fast.

HIGH TECH FLORICULTURE :

The production of flowers in green houses is gaining much more importance. The State Government is providing all the required help and technical guidance for the erection of green houses and cultivation of high value crops in the polyhouses under controlled conditions. A separate proposal has been prepared and is being submitted on high tech floriculture. The flowers produced under high tech can be exported to western countries.

POST HARVEST TECHNOLOGY OF HORTICULTURAL CROPS :

Most of the horticultural crops are perishable in nature and therefore the post harvest losses of horticultural produce is to the extent of 30 to 40 per cent. In order to minimize the post harvest losses, proper handling, storage and processing is essential. Good transport facilities are essential for quick transport of fruits, vegetables and flowers. The refrigerated vans for transport and cold storages for storage of horticultural produce are the essential facilities which can be provided in urban as well as rural areas in all the talukas of Parbhani district. The pre cooling of fruits and vegetables is essential to remove the field heat of the produce. The facilities of pre-cooling are to be provided at the storage centres for increasing the post harvest storage life of fruits and vegetables.

TRAINING TO FARMERS AND EXTENSION WORKERS :

The Horticulture industry is growing very fast and with the addition of new modern technologies like high tech cultivation, tissue culture, use of micro irrigation systems etc, the production rate is also increasing fast. The farmers and extension workers should also know these modern technologies. For this purpose there is need to train them and therefore, a separate proposal has been prepared in which a training centre is proposed in agricultural university which will serve the purpose of training of farmers and extension workers on specialized topics.

GROSS VALUES ADDED OF HORTICULTURAL CROPS :

The horticultural crops are more remunerative than the field crops. In Parbhani district the total gross values added from horticultural crops in 16210.8 lakh rupees. The fruit crops contribute the major share of 13136.6 lakh rupees. The value can be increased to the level of 45886.5 lakh rupees during 11^{th} five year plan. The fruit crops can contribute to the level of 36867 lakh rupees with the growth rate of 22.9 per cent. The vegetables and spices also can continent to the level of 25.4 per cent and 20.0 per cent growth rates respectively in increasing the gross values added. The floriculture industry is very fast growing industry and can contribute to the level of 51.2 per cent growth rate in respect of gross values added in Parbhani district during 11^{th} five year plan.

Lastly it can be concluded that horticultural industry is very much developing industry which can contribute an average growth rate of 23.1 per cent in the development process of Agriculture during 11^{th} five year plan. The fruits, vegetables, spices and flowers can increase the financial status of the farmers and can contribute in increasing the overall growth rate of Agriculture to significant levels. During 11^{th} five year plan, sufficient budget should be provided for Horticulture so that the desired growth rates can be achieved during the plan.

XI Plan outlay : Table shows the XI plan outlay for Horticulture under stream-I Rs. 600.00 lakhs and under stream II Rs. 10710 lakhs total Rs. 11310 lakhs.

Table no: 5.1
Present and projected area, production and productivity of Horticultural crops in Parbhani district

(Area in Hectares, Production in MT, Productivities in Mt/ha)

Sr. No.	Name of crop	Present 2012-13			Projected 2016-2017			Compounded growth rates		
		Area (A)	Production (P)	Product (P)	Area (A)	Production (P)	Product (P)	A	P	Y
A)	**Fruit crops**									
1	Banana	3200	160000	50	4000	272000	68	4.6	11.2	6.4
2	Sweet orange	4000	120000	30	6200	248000	40	9.1	15.6	5.9
3	Mandarin orange	1100	22000	20	2080	65600	32	13.6	24.4	9.9
4	Mango	4000	20000	5	8500	76500	9	16.2	30.8	12.7
5	Sapota	600	6000	10	1370	20550	15	18.0	27.9	8.4
6	Kagzi Lime	520	2600	5	970	7760	8	13.2	24.5	9.8
7	Awala	650	13000	20	1800	50400	28	22.6	31.1	6.9
8	Tamarind	63	1575	25	600	30000	50	57.0	80.3	14.9
9	Guava	132	2640	20	500	15000	30	30.5	41.6	8.6
10	Papaya	95	4750	50	550	33000	60	41.20	47.0	3.7
11	Jambhul	15	150	10	375	7500	20	90.4	118.7	14.9
12	Custard apple	500	4000	8	1200	15600	13	19.1	31.3	10.2
	Total (A)	**14875**	**356715**	**--**	**28145**	**841910**	**--**	**13.6**	**18.8**	**--**
(B)	**Vegetable crops**									
1	Onion	800	6400	8	1350	17550	13	11.0	22.4	10.3
2	Brinjal	1250	11250	9	1500	21000	14	3.7	13.3	9.2
3	Tomato	1100	7700	7	2000	24000	12	12.7	25.5	11.4
4	Bhendi	500	2000	4	1100	7150	6.5	17.0	29.0	10.3
5	Other vegetables	1038	15570	15	3200	64000	20	25.2	32.7	5.9
	Total (B)	**4688**	**42920**	**--**	**9150**	**133700**	**--**	**14.3**	**26.3**	**---**
(C)	**Flower crops**									
1	Aster	10	30	3	35	1280	8	28.4	56.3	21.7
2	Merigold	14	56	4	100	650	6.5	48.1	63.6	10.3
3	Rose	12	24	2	30	135	4.5	20.0	41.3	17.6
4	Tube rose	4	08	2	20	65	3.25	38.0	52.1	10.3
5	Mogra	9	36	4	25	131.25	5.25	22.7	29.5	6.2
	Total (C)	**49**	**154**	**--**	**210**	**2261.25**	**--**	**33.8**	**52.3**	**--**
(D)	**Spices**									
1	Turmeric	707	5656	8	1500	13875	9.25	16.2	19.7	2.9
2	Ginger	50	250	5	120	1200	10	18.9	36.9	14.9
3	Garlic	334	1336	4	450	2475	5.5	6.2	13.1	6.6
4	Chilli	940	5640	6	1850	13412.5	7.25	14.5	19.0	3.9
	Total (D)	**2031**	**12882**	**--**	**3920**	**30962.5**	**--**	**14.0**	**19.2**	**--**

Table no: 5.2

Gross values added of Horticultural crops in Parbhani district at constant prices (1999-2000)

(production in mt. Values in Rs. lakh)

Sr. No.	Name of crop	Gross values @ Rs/mt	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016		2016-2017	
			Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added
A)	**Fruit crops**													
1.	Banana	1800	160000	2880.0	209000	3762.0	220400	3967.2	241800	4352.4	253500	4563.0	272000	4896.0
2.	Sweet orange	4500	120000	5400.0	131584	5921.28	148500	6682.5	178500	8032.5	207200	9337.5	248000	11160.0
3.	Manadrain orange	3500	22000	770.0	30153	1055.355	40500	1417.5	49300	1725.5	58500	2047.5	65600	2296.0
4.	Mango	9000	20000	1800	30600	2754	41300	3717	53600	4824	62400	5616	76500	6885
5.	Sapota	4500	6000	270	11820	531.9	13910	625.95	16380	735.75	17780	800.1	20550	924.75
6.	Kagzi lime	4500	2600	117.00	3200	144	4200	189.0	4680	210.6	6230	280.35	7760	349.2
7.	Awala	10700	13000	1392.0	18900	2022.3	27500	2942.5	36400	3894.8	45900	4911.3	50400	5392.8
8.	Tamarind	9000	1575	141.75	4500	405.0	8750	787.5	14000	1260.0	20550	1849.5	30000	2700.0
9.	Guava	6000	2640	158.4	4400	264.0	6000	360.0	9100	546.0	11200	672.0	15000	900.0
10.	Papaya	1250	4750	59.375	10400	130.0	16200	202.5	22400	280	27550	344.375	33000	412.5
11.	Jambhul	5400	150	8.1	600	32.4	1400	75.6	3200	172.8	5400	291.6	7500	405.0
12.	Custard apple	3500	4000	140.0	5850	204.75	7500	262.5	9900	346.5	12600	441.0	15600	546.0
	Total (A)		**356715**	**13136.625**	**461007**	**17226.985**	**536160**	**21229.75**	**639260**	**26380.85**	**728810**	**31154.225**	**841910**	**36867.25**
B)	**Vegetables crops**													
1.	Onion	1800	6400	115.2	7650	137.7	9800	176.4	11220	201.96	14400	259.2	17550	315.9
2.	Brinjal	4500	11250	506.25	12800	562.5	14520	653.4	16560	745.2	18850	848.25	21000	945.0
3.	Tomato	4500	7700	346.5	10400	468.0	13500	607.5	17000	765.0	19800	891.0	24000	1080.0
4.	Bhendi	3500	2000	70.0	3150	110.25	4000	140.0	4950	173.25	6000	210.0	7150	250.25
5.	Other Veg	4000	15570	622.8	19808	792.32	25500	1020.0	36000	1440.0	49500	1980.0	64000	2560
	Total (B)		**42920**	**1660.75**	**53808**	**2070.77**	**67320**	**2597.3**	**85730**	**3325.41**	**108550**	**4188.45**	**133700**	**5151.15**

(Cont.2)

(Table Cont.)

(production in mt. Values in Rs. lakh)

Sr. No.	Name of crop	Values @ Rs/mt	2011-2012		2012-2013		2013-2014		2014-2015		2015-2016		2016-2017	
			Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added	Prod.	Value Added
C)	**Flower crops**													
1.	Aster	80000	30	24.0	60	48.0	100	80.0	150	120.0	210	168.0	280	224.0
2.	Merigold	21550	56	12.068	90	19.395	200	43.1	330	71.115	540	116.37	650	140.075
3.	Rose	60000	24	14.4	37.5	22.5	51	30.6	77	46.2	108	64.8	135	81.0
4.	Tube rose	40000	08	3.2	27.0	10.8	37.5	15.0	44	17.6	54	21.6	65	26.0
5.	Mogra	30000	36	10.8	51.0	15.3	67.5	20.25	95	28.5	110	33.0	131.25	39.375
	Total (C)		**154**	**64.468**	**265.5**	**115.995**	**456**	**188.95**	**696**	**283.415**	**1022**	**403.77**	**1261.25**	**510.45**
D)	**Spices**													
1.	Turmeric	12000	5656	678.72	7342.5	881.10	9350	1122.0	11375	1365.0	12600	1512.0	13875	1665
2.	Ginger	25000	250	62.5	360	90.0	560	140.0	800	200.0	900	225.0	1200	300
3.	Garlic	7500	1336	100.2	1615	121.125	1845	138.375	2018.75	151.406	2200	165.0	2475	185.625
4.	Chilli	9000	5640	507.6	7125	641.25	8775	789.75	10260	923.4	11760	1058.4	13412.5	1207.08
	Total (D)		**12882**	**1349.02**	**16442.5**	**1733.475**	**20530**	**2190.125**	**24453.75**	**2639.806**	**27460**	**2960.4**	**30962.5**	**3357.705**

Table 5.3 :
Gross value added of Horticulture crops in Parbhani district

(Rs in lakhs)

Sr. No.	Crops	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
1.	Fruit crops	13136.625	17226.985	21229.75	26380.85	31154.225	36867.25
2.	Vegetable crops	1660.75	2070.77	2597.3	3325.41	4188.45	5151.15
3.	Spice crops	1349.02	1733.475	2190.125	2639.806	2960.4	3357.705
4.	Flower crops	64.468	115.995	188.95	283.415	403.77	510.45
	Total	**16210.863**	**21147.225**	**26206.125**	**32629.481**	**38706.845**	**45886.555**

Table 5.4 :
Compound growth rate.

(Rs in lakhs)

Sr. No.	Crops	2009-2010 to 2011-12	2016-2017	Compound growth rate
1.	Fruit crops	13136.625	36867.25	22.9
2.	Vegetable crops	1660.75	5151.15	25.4
3.	Spice crops	1349.02	3357.705	20.0
4.	Flower crops	64.468	510.45	51.2
	Total	**16210.863**	**45886.555**	**23.1**

5.3 COMPREHENSIVE DISTRICT AGRICULTURAL PLAN (SERICULTURE) – PARBHANI DISTRICT:

Sericulture, an agro based activity is one of the highly remunerative and employment generating industry.

Mulberry area & mulberry silkworm cocoon production increased substantially after 2006 in Parbhani District.

By adopting stipulated package of practices, a farmer can attain net income levels up to Rs. 75000 to Rs. 100000/- per ha per annum.

The data on mulberry plantation, DFLS consumed and cocoon production of Parbhani district have been incorporated in table 5.7.

It is observed from the data in table 5.7 that a total of 130.8 ha was under mulberry cultivation by march 2013. Number of farmers engaged were 269, out of this 100 farmers were trained in Sericulture.

It is further observed that a total number of 41,136 DFLS were consumed on an area of 130.8 ha of mulberry cultivation. Out of these only 2100 Bivoltine CRS DFLS breed were consumed i.e. only 5.10 % DFLS of bivoltine DFLS were consumed. Whereas 94.89% of Kolar Gold (cross bred of multi * bivoltine) were reared by the farmers.

The average consumption of DFLS per ha by the farmers of Parbhani Dist was 683.06 DFLS per ha per year as against average of 1052.67 DFLS/ha by the farmers of Marathwada region. The recommended & potential consumption is 2000 DFLS per ha per year.

It is clear that DFLS consumed by the farmers of Parbhani District was very low against potential consumption thereby affecting productivity of silkworm cocoons in the District.

COCOON PRODUCTION:

Farmers of Parbhani District produced 10,025.3 kg of silkworm cocoons worth Rs. 1503750/- i.e. 15.03 lakhs during 2012-2013.

Data given in table 5.7 further indicate that average cocoon production of the farmers of Parbhani District per ha from old plantation was 186.8 kg/ha against average of 362.97 kg/ha of Marathwada region, and 525 kg / ha from the state. The potential and recommended productivity of cocoons is 1000kg cocoons per ha per year.

It is clear from above figures that the average productivity of cocoons of Parbhani Dist. was very low as compared to the state and potential yield.

Information on talukawise distribution of mulberry plantation and number of farmers is given in table 5.6.

It is seen from table 5.6 that Pathri taluka had 50.08 ha of mulberry cultivation followed by Manwat (29.2ha) , Palam (20ha), Parbhani (16.80 ha) and Jintur taluka had (14.40 ha.)

Purna, Gangakhed, Sonpeth and Sailu Talukas had Nil cultivation of mulberry plantation.

Department wise **NEW** Schemes proposed (Rs.in Lakhs)

Stream-I

Name of Department	Scheme proposed	Year			Total
		2014-15	2015-16	2016-17	
Sericulture	Assisance of Chawki Rearing Centre	6.90	6.90	0.00	13.80
	Assisance multiend Reeling Units	20.0	20.00.0	0.0	40.00
	Assisance forIrrigation facility	25.00	25.00	25.00	75.00
	Package for Molberry Plantation6.88	6.88	6.88	6.88	20.63

Table No. 5.5

Mulberry Plantation, DFLS consumed and Cocoon production of during 2012 - 13

Sr. No.	Items	Data
1	No. hectares under Mulberry cultivation	130.8 ha (327 acres)
2	No. of farmers engaged in sericulture	269
3	No. of farmers trained	100
4	Area under Old plantation	36.6 ha (91.50 acres)
5	Total no. of DFLS consumed from old plantation	25000
6	Total No. of DFLS of consumed	41,136
7	Total no of Bivoltine CRS hybrid consumed	2,100
8	No. of DFLS of Kolar Gold consumed	39,036
9	Total production of silkworm cocoons (kg)	10,025.3 kg
10	Value of Total cocoons produced in district in lakhs	15,03750 or 15.03 lakhs
11	Average DFLS consumed from old plantation	683.06 DFLS
12	Average cocoon production per ha from old plantation	186.8 kg/ha
13	Average cocoon production from Marathwada Region	362.97 kg
14	Average cocoon production from state	525.00 kg

Table No. 5.6
Taluka-wise distribution of mulberry cultivated area (in ha.), number of Farmers of Parbhani District during 2012-13

Sr. No.	Name of the Taluka	No. of Farmers	Area under Mulberry (ha)
1	Parbhani	33	16.80 ha
2	Purna	0	0
3	Palam	47	20.00
4	Pathri	94	50.08
5	Manwat	66	29.2
6	Jintur	29	14.40 ha
	Total	**269**	**130.48**

CONSTRAINTS FOR LOW PRODUCTIVITY:

The average productivity of silkworm cocoons was very low i.e. 186.8 kg/ha . The constraints for the same are as under.;

1) Low consumption of DFLS by the farmers.
2) Lack of Training Facilities to Farmers with District Sericulture office, Parbhani.
3) Inadequate utilization of mulberry leaves
4) Mulberry cultivation is scattered and there are no clusters of mulberry Gardens.
5) Inadequate Technical staff.
6) Meagre area of mulberry under bivoltine CSR hybrids
7) No chawki Rearing facilities in the District
8) No private cocoon Reelers and cocoon purchase centres in the District.
9) Delayed payment to the Farmers by the sericulture Dept against purchase of cocoons.
10) Low adoption of improved and recommended technologies of mulberry cultivation and silkworm rearing by the farmers.

STRATEGIES AND NEW SCHEMES PROPOSED FOR PARBHANI DISTRICT DURING XITH PLAN PERIOD:

Following strategies and New schemes besides existing schemes are proposed to increase the productivity and production of cocoons in Parbhani district.

1 INCREASING THE AREA UNDER MULBERRY CULTIVATION:

Parbhani district had 130.8 ha land cultivated for mulberry garden. It is now proposed to double the area under mulberry cultivation i.e. up to 250 ha during the XI th plan period. Every year 50 ha would be brought under new cultivation of mulberry garden. About 200 ha of area would be brought under new mulberry cultivation during 2013 to 2017 (4 years).

2. INCREASING MULBERRY AREA UNDER BIVOLTINE CSR HYBRIDS:

To meet the deficit of raw silk yarm in Maharashtra it is necessary to increase the productivity and quality of silk, which is possible only through increasing the area under Bivoltine CSR Silk Breed.

At present only 15.10 % is under Bivoltine CSR hybrid. It is now proposed to increase this area to 25% i.e. 50 ha would be bought under bivoltine hybrid in 5 years. Every year 10 ha would be brought under hybrid for 4 years (2014-15 to 20016-17)

3.**ASSISTANCE FOR TRAINING CENTRE FOR PARBHANI DISTRICT:**

There is no training facility for the Farmers with District Silk Office including irrigated land.

It is now necessary to develop infrastructural facilities namely Training Hall, Farmers Hostel, Chawki Rearing Centre, Development of Mulberry Garden, Rearing House on an area of at least 2 ha of land.

The district Silk Development Office has only 6 posts of Technical cadre. As per the recommendations of the Central Silk Board there should be one Field Assistant for every 20 ha of Mulberry Garden. A total of 12 posts of technical cadre are required At present there are six posts of technical cadre at Dist. Sericultural Office, Parbhani. Additional 6 posts of Field Assistants are required.

Parbhani District also needs a Jeep for conveyance of the staff to guide the farmers in remote villages.

An amount of 200 lakhs is proposed under special Central Assistance or State Govt. for this purpose.

Provision of six new posts of Field Assistants, their T.A. & D.A. will have to be made by the State Govt.

CATALYTIC DEVELOPMENT PROGRAMME (CDP)

Different schemes under CDP have been provided for mulberry Development activities by the Central and State Govt.

Physical and financial programme proposed for new schemes are included in Table.

4.**SUPPORT FOR MULBERRY PLANTATION DEVELOPMENT:**

For Mulberry Plantation Development an amount of Rs. 5500/- acre or Rs. 13750/- per ha under CDP are provided under irrigated Gardens. The central silk board (CSB) provides 50% subsidy & rest 50% has to be equally borne by beneficiary & State Govt. (25:25%).

An total amount of Rs. 20.63 lakh would be required @ Rs. 6.88 lakhs per year for three year

5. ASSISTANCE FOR IRRIGATION & OTHER WATER CONSERVATION AND USAGE TECHNIQUES:

Under CDP during XIth plan the Govt. will provide beneficiary Rs. 50,000/- per ha to include all types of irrigation such as drip, tube/open wells, shallow wells, ponds, Farm ponds, surface tanks and similar water harvesting systems. The subsidy is up to 1 ha of plantation.

The C.S.B. provides 50% grants and State & beneficiary would contribute 25% each. Accordingly Rs. 25 lakhs are proposed for 50 ha each year and Rs. 100 lakhs for 4 years i.e. 2014-15 to 20016-17. The Govt's share would be 75.00 lakhs.

6.SUPPLY OF REARING APPLIANCES (INCLUDING IMPROVED MOUNTAGES) / FARM EQUIPMENTS TO FARMERS – FOR BIVOLTINE SERI-FARMERS:

In order to encourage production of bivoltine silk the unit cost of Rs. 40000/- per acre or Rs. 1.00 lakh per ha. to be shared at 50:25:25 by CSB., State and beneficiary have been provided under CDP. Every year (10 ha x 1.00) Rs. 10 lakhs have been proposed. A total of 40 lakhs are provided for 4 years for 40 ha. (table 5.9) the Govt's. share would be Rs. 30 lakhs.

7.ASSISTANCE FOR THE CONSTRUCTION OF REARING HOUSES:

Under C.D.P. a subsidy of 50% has been provided, for the construction of Rearing Houses. The share of State and Centre would be 25% each and that of beneficiary 50%.

Each year 100 units of Rearing houses at a cost of Rs. 100 lakhs have been proposed. A total of 400 lakhs for 400 units of Rearing houses have been proposed for 400 farmers for 4 years costing Rs. 1.00 for each unit. The Govt. share would be Rs. 200 lakhs.

8. ASSISTANCE FOR CHAWKI REARING CENTRE BUILDING AND CHAWKI REARING EQUIPMENTS:

Under C.D.P. Govt. have proposed to give assistance of Rs. 3.45 lakh/ CRC and subsidy is proposed to the extent of 50% by CSB and State Govt. and rest 50% would be contributed by beneficiary.

In Parbhani district not a single Chawki Rearing Centre is available, it is proposed to have at least 4 CRC one each for Parbhani, Pathri, Palam and Manwat Talukas, provided these talukas develop cluster's of mulberry Garden. Each claster may have 50 to 60 ha area under Mulberry Cultivation.

A total of Rs. 13.8 lakhs have been provided under this scheme (table 5.9). Govt. share would be Rs. 6.9 lakhs.

Chawki reared worms will be provided to the farmers in and around 50 ha radius @ Rs. 350/100 DFLS worms instead of silkworm eggs. The concerned farmer has to be trained in Chawki Rearing. Each CRC would rear 5000 DFLS per batch.

9. ASSISTANCE TO ESTABLISH MULTIEND REELING UNITS:

It is necessary to motivate private entrepreneurs to establish Reeling units, so that these entrepreneurs would purchase cocoons directly from farmers. Farmers would get better price for cocoons.

It is proposed that Govt. of Maharashtra may also provide incentive of Rs. 100 per kg of raw silk produced to the Reelers of Marathwada in order to encourage entrepreneurs to establish reeling units Govt. of Karnatka provides such incentive to the

Reelers in their state. For multiend 10 basin Reeling units C.S.B. provides 35%, where as State Govt. 15% and rest 50% share of the cost of machine would be borne by entrepreneur.

Total cost of establishing one Reeling unit would be 10 lakhs each. It is proposed to establish four Reeling Machines. For 4 Reeling units for private entrepreneurs total grant required would be 40 lakhs. (table 5.9) Govt's share would be 20 lakhs.

10. **FARMERS TRAINING PROGRAMME:**

It is proposed to train 150 farmer every year and a total of 600 farmers would be trained. An amount of Rs. 1000/ farmer (Rs. 750/- as stipend + Rs. 250 for other expenses) would be required for farmers training programme every year 150000/- would be required and a total of Rs. 600000/- would be required during 4 years of plan period.

11. **TIMELY SUPPLY OF INPUT FOR MULBERRY GROWERS:**

Prompt & timely supply of inputs and payment against silkworm cocoons purchased by the Dept. of Sericulture from farmers are very necessary in the interest of development of sericulture in this district.

If above mentioned constraints are taken care of and new schemes and strategies are properly implemented the productivity and production of Parbhani District could be doubled and we would be taking one step forward to achieve our vision of self sufficiency and export of silkwarn.

12. TOTAL BUDGET OUT LAY FOR COMPREHENSIVE AGRICULTURAL PLAN (SERICULTURE) FOR PARBHANI DISTRICT (STREAM – I):

Total budget outlay of new schemes (stream-I) has been incorporated in table 5.9.

is observed that total outlay for new schemes is 827.30 lakhs(Rs. 8.27 crores). The share of the Govt. would be Rs. 558.52 lakhs (Rs. 5.58 crores)

13. EXISTING SCHEMES WITH BUDGET PROVISION OF PARBHANI DISTRICT DURING XI PLAN PERIOD AS PROPOSED BY THE DISTRICT SERICULTURE OFFICE (STREAM – II)

The details of the budget outlay of existing schemes is given in table 5.10 for Parbhani District which needs further continuation (table 5.10).

Total budget proposed for XIIth plan by the Parbhani Dist. Silk office is Rs. 158.17 lakhs.

14. PROJECTED SILKWORM COCOON PRODUCTION IN PARBHANI DISTRICT

The details of projected silkworm cocoon production of Parbhani District are depicted in Table 5.12 (2012-13 to 20016-17).

Table 5.7
Projected cocoon production in Parbhani district.

Sr. no.	Year	Production of cocoons in kg	Growth rate %	Compound growth rate %
1	0	10,025	-	-
2	1	11,500	14.71	-
3	2	13,000	13.04	-
4	3	15,000	15.38	-
5	4	18,000	20.00%	12.42%

It is seen from the Table 5.12 that the projected compound growth rate of 12.42% would be achieved at the end of XIth plan period.

14. PROJECTED SILKWORM COCOON PRODUCTION AND ITS VALUE AT THE END OF THE XITH PLAN PERIOD.

The data regarding projected cocoon production and its value of Parbhani District at the end of the XIIth plan period are given in table 5.13.

Table 5.8
Projected silkworm cocoon production and its value at the end of XIth plan period

Sr. no.	Year	Prod. Of cocoons in kg	Expected value in Rs. Lakh @ Rs. 150/-kg	Value from increased prod. In Rs.
1.	2012-13	10,025.3	15,0,3750/-	11,96,250/-
2.	2016-17	18,000	27,00,000/-	
Compound growth Rate 12.42%				

5.4 COMPREHENSIVE AGRICULTURE DEVELOPMENT PLAN PARBHANI DISTRICT LIVE STOCK

INTRODUCTION:

There are 9 Talukas in the District. These are (i) Parbhani, (ii) Jintur, (iii) Purna, (iv) Gangakhed, (v) Sailu, (vi) Pathri, (vii) Palam, (viii) Manwat and (ix) Sonpeth. The livestock resources of the district are of the order of 4,76,000 cattle units, comprising of cattle, buffaloes, sheep, goats, pigs and poultry etc. Taking into consideration, the moderate price of Rs. 10,000/- per cattle unit, the livestock resources of Parbhani District amount to the order of Rs. 476/- crores as a fixed asset. This generates the products like Milk, work (draft), meat, wool, eggs and broiler (poultry meat), skins/hides and organic manure.

Details of Livestock population viz. Cattle, buffaloes, sheep, goats and poultry are provided in the enclosed tables (Table No. 5.15 to 5.17). Details of Veterinary institutes, staff (man-power) available in the Parbhani District are also provided in the appended table (Table No. 5.18). Details of other infrastructure facilities like procurement of milk, collecting societies, details of production of milk, meat, wool, eggs and broiler (poultry meat) etc. are also appended in the appropriate sections of the project report.

PRESENT SCENARIO:

On comparison with the data of 1997 Livestock census with that of 2003 Livestock Census, it is observed that there is increase in population of cross-bred cattle and buffaloes by 9.2 percent and 14.7 percent receptively. While there is (11.6 percent) decrease in Deshi cattle population. The sheep population remained static, while goat population increased by 11.9 percent. Poultry population also has decreased significantly (24.5 percent).

CATTLE AND BUFFALOES:

Breeding Policy for cow and buffaloes aims at increased productivity of cows by genetic improvement. However, it also aims at conservation of native breeds and ensuring adequate supply of bullocks for animals draft power in rural areas. For achieving genetic up-gradation, three pronged strategy is to be adopted.

(a) Cross-breeding programme for non-descript cows by Artificial Insemination using Jersey and / or HF exotic bull frozen semen. Up-gradation of cross-breds also by using frozen semen of pedigreed bulls of the same breeds.
(b) Natural Services by 'True to type' bulls of selected native breeds – in such areas as tribal, hilly and non-accessible tracts.
(c) Conservation of native breeds by using semen of Proven 'True to type' bulls of the same breed.
(d) For genetic improvement in buffaloes semen from recognized breeds of buffaloe bulls like Murrah / Surti will be used.

BREEDING: ARTIFICIAL INSEMINATION

The work of A-I is mainly undertaken by the Government and Zilla Parishad Agencies through different Veterinary Institutes in the district. Apart from this, co-operative societies and private agencies also are providing A-I Services to some extent.

On scanning the available data / statistic etc. it is revealed that, the coverage by A-I in respect of eligible cow / buffaloes is only 11.4 percent. Constraints are:-

(i) Technical man-power is inadequate. As per the laid down norms, there should be 145 Veterinary graduates for providing all technical services including that of A-I. However, there are only 87 Veterinarians. That means there is a shortage of 58 technical hands.

(ii) Mobility of the available staff is very much restricted for want of vehicles or conveyance allowance.

(iii) At present LN_2 is being supplied from the district head-quarter to different veterinary institutes and A-I Centres. Only one vehicle is available on rate contract basis for supply of LN_2.

(iv) Another important constraint is storage of electricity supply (Load shedding), which is getting further aggrevated as there is no supply of LPG (gas) or even kerosion oil. This badly hampers the important activities like thawing of frozen semen straws and sterilization of instruments etc. To overcome the situation following strategies are suggested.

A). DOOR STEP DELIVERY OF BREEDING SERVICES :

Breeding Services through A-I Programme has reached to only 11.4 percent of eligible cows and its average success rate is also rather poor. In case of buffaloes, it is yet to be acceptable to buffalo keepers due to silent heat problem in this species. For increase in success rate of A-I Services and also for covering sizable number of breedable population, it is necessary to have timely delivery of services; therefore door step delivery of this service is the right strategy.

Unemployed Veterinary Graduates and diploma holders will be engaged (as Pashudhan Sevaks) on contract basis. In Parbhani District such 58 technical hands will be required. Those along with the available man-power will be reaching to the maximum number of eligible cows / buffaloes population for doing timely A-I work. To overcome non-availability of electricity, LPG supply must be arranged at all institutes. This will result in not only better conception rate, but will also give birth to increased number of calves. In turn, this will help to increase growth rate of milk production. Mobile Van at least at district head quarter for regular supply of LN_2 and frozen semen is a must. Budget provision required is indicated separately in the profile of project.

ENSURING QUALITY OF A-I SERVICES :-

(i) Close monitoring of A-I Services provided by inseminators.

(ii) Inseminator must register himself.
(iii) There should be certain specified minimum facilities for storage and distribution of frozen semen, LN_2 and record of semen used.
(iv) A-I Service Card should be made compulsory.
(v) Knowledge updating in respect of advanced A-I technology by arranging compulsory 'Refreshers Training Course' for all A-I workers.
(vi) All, the above mentioned multi-pronged, systematic planned approach will help in increasing the number of timely A-I carried out, better conception rate, more pregnancies, and more number of calves born. Thus large number, of heifers born will subsequently turn into milch animals. This will help in boosting up to milk production growth rate.

For increasing A-I among Deshi cows, it will be better to have integrated area for inseminations and allied activities by selected clustered villages, so that intense close technical watch can be provided through expertise personnel.

B). SCIENTIFIC CALF REARING :

Level of scientific calf rearing is poor among milch animals keepers. As a result there is delayed maturity in heifers and the benefit of genetic up-gradation programme is not available to its fullest potential, resulting into lower growth rate of milk production than is possible.

Cross-bred genetically improved calves born, and genetically improved buffalo heifers will be the target group. For selecting calves from 1 to 2 years age group, the best growth attained shall be the criterion taking Tahsil as unit. Provision of Rs. 20/- per calf per day will be made. Estimated cost of Rs. 175 lakh will be per annum. It is expected that by demonstration of scientific calf rearing effect, calf owners will understand the importance of calf rearing and as a result 40 percent to 50 percent calf born from A-I programme will grow into cows within some 3 years time and thus will add to increase in milk production.

C). SCIENTIFIC TACKLING OF INFERTILITY IN DAIRY ANIMALS:

A very large number of cows and buffaloes from breedable age group were found suffering from infertility problem and some of them heifers had not calved even once. The incidence of infertility problem is high in cross-bred animals also. Scientific approach is essential for better diagnosis and effecting treatment of infertility cases. Regular Gynaco-clinical examination of problem cases, monitoring of estrus and estrus cycles, testing of blood samples for assessing deficiencies, testing for hormonal assay and if required ultra-sonagraphic examination of ovaries etc. and then by undertaking effective treatment will help in brining such animals into production.

Cross-bred infertile cows and high yielding problematic buffaloes will be selected for necessary treatment. For this infertility registers maintained at Veterinary Poly-clinics, dispensaries and A-I Centres will be refereed to. Necessary budget

provision (Rs. 1000 per cow / buffalo) will be made. Budget provision required for Parbhani District is indicated in Profile of a Project.

D). PRODUCER- FARMER SCHEME (FOR BULL PRODUCTION) :-

For production of quality frozen semen doses, availability of high pedigreed bulls is a must. Considering the constraints in producing quality bulls mothers at State owned bull mother farms, it is imperative to involve producer farmers in production of bill mothers. Similarly, progressive farmer breeders can be involved in production of pedigreed bulls too. Initially, involvement of such progressive producer-farmers may be taken for production of indigenous bull mothers and male calves. However, at a later stage they may be involved in production of cross-bred bull mothers and male calves too. Budgetary provision required for Parbhani District is indicated in the Profile of a Project.

E) SELECTION OF PRODUCER – FARMER (FOR SELECTION OF HIGH YIELDING FEMALES):

The Department of Animal Husbandry will carry out taluka-wise milk yield competitions. Based on highest yield criterion, the elite cows and buffaloes will be selected, which may be further taken as bull mothers. Owners of such elite cows / buffaloes will be awarded prizes and be further registered as Producer-Farmers for Bull Mother Producer – Farmers. Budgetary Provision required for arranging taluka-wise Milk yield competitions, awarding prizes and then for procuring promising elite male calves is indicated in appended Profile of a Project.

All these strategies are aimed to enhance the growth rate of milk production to 6 percent.

PRESERVATION OF RED KANDHARI AND DEONI CATTLE :

In Parbhani District Red Kandhari and Deoni breed cattle are found. These animals are playing important role in improving employment potential and economic condition of the farmer-breeders. However, in recent years these prized animals are disappearing due to massive cross-breeding programme and there is a fear of getting these breeds extinguished. Hence, it is very necessary to make sincere and hard efforts for preservation of these breeds of National importance.

FOLLOWING STRATEGY IS SUGGESTED :-

(i) House-to-house survey of the entire district for locating and registering each and every R. K. and Deoni breed animal.
(ii) After registering these animals, their details regarding pedigree, age, sex etc, will be available. All these animals will be applied ear tags for record.
(iii) Breeding of these animals will be arranged strictly through either frozen semen or by natural services from 'True to type' breeding bulls of the particular breed only.
(iv) Castration of Scrub bulls to avoid indiscriminate breeding.
(v) Formation of Breeders Associations.

(vi) Participation of promising animals in Regional as well as in National Cattle shows.

(vii) Efforts also be made for faster multiplications of these breed animals through Embryo Transfer Technology. Embryo Transfer Technology Project may be undertaken by the college of Veterinary and Animal Science, Parbhani. Budgetary provision required for the project of Preservation of Red Kandhari and Deoni Breed animals is indicated in Profile of a Project.

DAIRYING

INTRODUCTION :

The overall growth rate of 4.5 percent in the Livestock sector is steady inspite of the fact that investment in this sector is not substantial. Women constitute 70 percent of the labour force in Livestock farming. As the ownership of Livestock is more evenly distributed with landless labourers and marginal farmers, the progress in this, sectors will result in a more balanced development of the rural economy. Animal Husbandry and Dairying will receive high priority in the efforts for generating wealth and employment, increasing the availability of animal protein in the food basket.

Milk production is helping to raise living standard of marginal farmers, unemployed youth and small farmers, women labourers etc. However, due to shortage of feed and fodder and facilities for collection, storage and processing etc. there is no expected increase in the growth rate of milk production in Parbhani District.

PRESENT SCENARIO:

The role of the Dairy Development Department is shrinking and more responsibilities are being shouldered by the cooperative milk federations. Earlier the entire cooling and related infrastructure was with the Dairy Development Department. However, during the recent past as per the State policies, these things are being transferred to the milk federations. Earlier, during ninetees, there were certain programme with the Department to increase the milk production, viz. Supply of heifers / buffalo calves to the farmers, provision of training of farmers and supply of fodder seed etc. These programmes are slowly disappearing. In the era of delicencing and competitive market, the earlier monopoly of cooperative and the Government dairy is also disappearing and hence more private agencies are coming in the scene. This also has an advantage of getting competitive rates for the milk to the producer.

Details of taluka-wise cows and buffaloes population of Parbhani District are provided in the appended (Table No. 5.15). At present, there are 269 cooperative milk societies in the district. However, out of these, 103 societies have become dormant. Reasons for the societies becoming dormant are – financial irregularities, (fraud) man-power and infrastructure facilities etc, are inadequate. In addition to 166 milk cooperative societies there are 5 Government Milk Schemes also are in action. These are collecting 98000 litres of milk per day by plying on 22 milk routes. Recently, few private agencies like Dynamics, Sanhyadri etc, have also entered into the business. These private agencies are attracting more and more producers by collecting the milk

twice in a day, testing individual milk samples that too only for FAT percentage and arranging quick regular payment to the producers. Testing the milk samples only for FAT percentage and not for both i.e. FAT as well as SNF is helping to curb the tendency of adulterating milk by producers. This is resulting in getting quality milk by the costumers and remunerative prices to the producers.

Because of lower purchase rates of milk from the Government and also delays in payments, a substantial quantity of milk (25000 Litres per day) is processed by producers for Khova / Peda and Kalam (in Gangakhed taluka) preparation.

Total milk production in the State is 70 lakh M.T. Contribution from Parbhani District is 2.8 M.T. When compared to the leading district like Ahmednagar (18 lakh litres of milk per day), Parbhani District is lagging very much behind and there is huge gap in milk production. Reasons for this huge gap in Parbhani District are:-

(i) Number of breedable cross-bred cows and buffaloes is much more (2,76,000 cows and 1,16,000 buffaloes) than 92121 cross-bred cows and 58554 buffaloes in Parbhani District.
(ii) Chilling and Testing etc facilities have not developed in Parbhani District have not developed to the fullest extent.
(iii) Majority of the milk cooperative societies have become dormant and producers are not getting prompt payment.
(iv) There is shortage of feed and fodder.
(v) Marketing facilities for sale of milk and milk bi-products are also not properly developed etc.

Dairy Industry stands on following important pillars. (a) Breeds and Breeding, (b) Feeds and Feeding, (c) Management, disease control and health cover, (d) Milk and Milk bi-products, their disposal.

(A) BREEDING :

As per the state breeding policy, to increase milk production, up-gradation of local (Deshi) cows as well as of cross-breds, inseminations by using frozen semen of HF and Jersey breed bulls should be used. And for established breeds (Red Kandhari and Deoni) semen of these breeds bulls be used. For buffaloes frozen semen of Murrah and Surti buffalo bulls should be used. Efforts should be made for carrying out Artificial Insemination at door and also at optimum time, which will result in better conception rate and more pregnancies. Thus will help to enhance the growth rate of milk production.

(B) FEEDS AND FEEDING :

Another, aspect of successful dairying is feeds and fodder component. Two important constituents of feeding are fodder (green and dry fodder) and concentrates. It is observed than in Parbhani District, Jowar, Bajra, Maize, Sugarcane tops etc, are used as fodder and that too in majority of cases in un-chaffed condition. This results in huge wastage of fodder. Hence, only chaffed material should be fed. It is also observed that, majority of the farmers are not feeding wheat bhusa with erroneous impression that animals do not eat it, as this sticks to the animals pallet. It will not be out of place to

mention here that, cattle owners from Hariyana, Punjab and Uttar Pradesh etc, are not finding it difficult to feed wheat bhusa to their animals. Hence, it is necessary to persuade the owners to feed wheat bhusa to their animals by giving them practical demonstration of feeding wheat bhusa.

In Parbhani district very few cattle owners are feeding Lucern and Sugarcane tops as green fodder to their animals. To increase the growth rate of milk production, farmers having enough land, with some irrigation facility be encouraged to grow green fodder such as Lucern, burseem and more important one like Para grass. Animals can consume 25 kgs of green fodder depending on their size, body weight and production level etc. However, minimum 7 kgs to 10 kgs of green fodder should be fed.

CONCENTRATE FEED :

Concentrate feed is required for body maintenance, milk production and in pregnant animals for development of calf in the womb. In Parbhani District, concentrate ingredients such as Tur churi, Mung churi, Udid churi, Gram churi and oil cakes like Groundnut, Cotton seed, Sunflower and Soybean etc, are easily available. In order to make balanced cattle feed at economic price, Wheat bran, Gram, Tur, Mung husk and Jowar, Bajra crushed be used in appropriate proportion (Churi 40 percent to 55 percent + Oil cakes 20 percent to 25 percent + Husk and Crushed food grains 30 percent to 35 percent). Ingredients should be mixed in such a proportion that, final product should contain 16 percent to 18 percent DCP and 60 percent to 72 percent TDN. Apart from this, common salt at the rate of 2 percent and 1 percent mineral mixture should also be added.

(C) MANAGEMENT, DISEASE CONTROL AND HEALTH COVER :

Appropriate measures should be adopted for better management of young ones as well as of other animals. Disease control and health cover details are provided in a separate chapter.

(D) DISPOSAL OF MILK AND MILK PRODUCTS :

It is the most important aspect of the Dairy Industry and yet it is observed that, unfortunately it is the most neglected one. To avoid spoilage of milk, the same is to be disposed off (sold out) immediately. If, if is not possible, there must be necessary infrastructure facilities, such as daily twice collection of milk, chilling facilities (farm / bulk coolers) within the radius of 5 kms to 10 kms. Milk collecting agencies should arrange for individual testing of milk samples for SNF and FAT percentage. Testing results should be made available to the producer and payment also should be made promptly. This single step will infuse confidence in the producers and they will be encouraged to get more and more milch animals.

In certain areas, where milk collection or sale is not possible, producers will be compelled to make milk bi-products such as Ghee, Khova, Paneer, Shrikh and etc. Necessary facilities like Khova / Paneer making maschines will have to be provided to such producers. Efforts will also have to be made for providing them suitable marketing facilities for sale of these bi-products at remunerative price to the producers.

At present, milk is being collected only once in a day. It is tested both for FAT as well as SNF percentage. However, if milk will be collected twice in a day, there will be no problem of storage of milk drawn in the evening hours. Further, if milk is tested only for FAT percent, producer will not get tempted for adulteration of milk. Thus, producer will get better price and customer will also get good quality milk.

Thus, assured feed / fodder supply, better facilities for collection, chilling, testing and prompt payment to the producer, door step delivery of A-I services and better health cover and disease control of their animals will help in enhancing the growth rate of milk production to 6 percent.

SHEEP AND GOATS

INTRODUCTION :

During the last 4 decades, there has not been much increase in the Sheep population. Indian wool is primarily used in production of carpets, druggests and wall hanging etc. To enhance the quality of wool, Shepherds need incentives like credit, health coverage, breed improvement programmes and timely disposal of wool and surplus animals at a remunerative price.

Despite the least attention from the Planners, goat population has increased steadily during the last two decades. Details of sheep and goat population in Parbhani district are provided in the appended table (No.5.16). Osmanabadi breed goat is nationally famous and has won national medals on several occasions. It is in great demand all over the state and country for the reasons such as its sturdiness to diseases, early maturity and fast multiplication through twin births, low fat content in the meat apart from its delicious taste.

PRESENT SCENARIO :

Despite several benefits of stall fed goat rearing activity against the traditional rearing system, these have not been realized to the desired extent. The importance of goat farming has increased now due to its economic return. Goats need minimum inputs such as supplementary feeding, veterinary medicines and labour. At present goat meat production in Parbhani district is 15.60 M.T., which amounts to 8.3 percent of states total meat production.

BREEDING POLICY :

1. It is primarily aimed at increased meat production and at the same time for sheep, aims for increased wool production too.
2. Osmanabadi breed of goats and Deccany breed of sheep are identified as germ-plasm for genetic up-gradation of nondescript (local) breeds in respective species.
3. Considering the narrow gestation period and reproductive life span and also the other implications of A.I. technology in these species, natural services will continue to be the strategy for genetic up-gradation in sheep and goats.

4. Punyashlok Ahilya Devi Sheliva Mendhi Vikas Mahamandal Pune, will be responsible for to maintain farms for production of nucleus flocks of selected breeds and organize breeder-farmers associations. This will help for production of stocks to be distributed under its programmes.
5. Punyashlok Ahilya Devi Sheli va Mendhi Vikas Mahamandal, Pune MAFSU Nagpur, and Animal Science Divisions of State Agricultural Universities will be designate agencies responsible for conservation of native breeds of sheep and goats with element of public sector investment.

There are no ongoing schemes for development of sheep and goats in Parbhani District.

Under CADP of Parbhani district, following strategies are suggested to augment growth rate of meat production in goat to 6 percent. And along with increase in meat production it is aimed to increase wool production growth rate also in sheep. Strategies to be adopted for enhancing growth rate of meat production of goat are

(1) BREED VILLAGE :

It is scientific breeding programme for goats taking village as geographic unit for operation. Under the scheme true to type bucks of Osmanabadi breed will be supplied to goat rearing farmers in their village at 50 percent cost subsidy basis. These bucks will be produced at farms owned by State Sheep and Goat Development Corporation.

The bucks will be properly tagged. Every year there will be verification of existence and proper maintenance of these bucks by a committee consisting of Dy. Commissioner of Animal Husbandry, District Animal Husbandry Officer, Taluka Exension Officer etc. 15 percent to 20 percent refund per year, respectively will be provided to the owner on finding that the bucks are properly maintained on completing one and two years. After 3 years period these bucks will be shifted on rotation basis to different villages to avoid inbreeding.

1800 bucks will be supplied in Parbhani District. Budgetary provision required is indicated in appended Profile of Project.

(2) SUPPLY OF OSMANABADI DOES :

100 female members from SHGs of each taluka will be selected for supply of 2 Osmanabadi female goats at 50percent cost subsidy. Cooperative banks may provide loan for the remaining 50percent cost. Thus, 1800 more female goats will be available in the district every year. These females will be getting breeding services from the Osmanabadi breed bucks available in clustered breed villages. This will help in enhancing the growth rate of meat production. Budgetary provision required is indicated in Profile of a Project.

(3) TRAINING CAMPS :

Training camps will be arranged in all talukas at frequent intervals for imparting practical training to farmers, labourers from BPL groups, women members from SHGs etc. on scientific rearing, breeding, feeding etc. of goats. This will result in better management of their goats, further helping to enhance the growth rate of meat production. Budgetary provision required is indicated in the appended Profile of a Project.

(4) MINI SLAUGHTER HOUSES :

Well organized mini slaughter houses will be established. Where, along with clean water supply, other required infrastructure facilities like cold storage, refrigerated vehicle for transportation etc, will be made available. This will help in producing hygienically clean mutton and mincing maschines will help in transforming old animals into Kheema. All, the products will be reaching to the customers at even distant places also. Budgetary provision required is indicated in the appended Profile of a Project.

(5) MARKETING OF SHEEP / GOATS :

Well organized marketing facilities will be provided at all talukas. Along with clean drinking water, proper shelters, necessary provision will also be made to avoid interference from the middle man-agents, so that the producer will get remunerative price for his sheep and goats. This will also help to provide / supply good quality Osmanabadi breed goats to the farmers-breeders. Budgetary provision required is indicated in the appended Profile of a Project.

All these strategies are aimed to enhance growth rate of meat production to 6 percent.

SHEEP DEVELOPMENT :

At present, there are 22000 Sheep in Parbhani District. Normally, these are reared by nomadic type of breeders. Generally these sheep are of non-descript (Local type), which yield coarse wool mixed with hairs. This fetches very low price (Rs. 10 per kg), which is uneconomical to the producers. The weight gain of these sheep is also very slow and hence meat production is also rather poor. To enhance the quality and quantity of wool and for increasing the growth rate of meat production, shepherds need incentives like credit, health cover, breed improvement programmes and timely disposal of wool and meat at remunerative price.

This will result in bringing about genetic improvement in the progeny. Thus, there will be better weight gain helping for increasing the growth rate of meat production. In addition it will also bring about significant improvement in both qualities as well quantity of wool produced.

Other strategies suggested earlier with goat development like training of farmer-breeders for increasing awareness of better Sheep Management, for imparting training of carpet weaving and also for better flaying of hides / skins with technical assistance from Central Leather Research Institute (CLRI), Chennai, Mini

SlaughterHouse and Marketing of Animals etc, remain common for Sheep Development also. Budgetary provision required is indicated in the appended Profile of a Project.

POULTRY

INTRODUCTION :

Poultry is one of the important Animal Husbandry Activities. Climatic conditions in the district (except for 2 hot months of summer) are conducive for poultry keeping. Business can be done by any group and by either sex. In present economic crisis, poultry keeping provides supporting income. Quality organic manure is another important factor.

PRESENT SCENARIO :

Details of taluka-wise poultry population of Parbhani district are provided in the appended (Table No. 5.17). The egg production in the district is 132 lakh per year, which accounts for 4.7 percent of State total egg production. In 1965, State Government established one intensive poultry development farm at Parbhani. There are also 4 private poultry farms. However, it is reported that, now all these farms are non-operational. There are 18 registered cooperative poultry societies. Majority of them also have become defunct. The wide spread incidence of dreaded 'Bird Flu' disease of poultry in 2005-06 especially in Nandurbar and Jalgaon Districts had jolted the poultry industry for some period forcing Government agencies to destroy thousands of birds. The same had impact in Parbhani district too. The poultry industry is now recovering slowly from this outbreak.

BREEDING POLICY :

1. Breeding policy for poultry aims at increased production of eggs and poultry meat by increasing productivity of native poultry birds and introduction of new species of birds.
2. State may continue to supply cross-bred stocks of improved breed like R.I.R. For this purpose, these types of stocks may be maintained by poultry farms owned by State.
3. Breeding policy for chicken breed mainly covers the species suitable for backyard poultry.
4. At present, the breeds developed by ICAR Institutes are recommended for the State, such as Giriraj and Vanraj have been selected for the purpose of up-grading deshi poultry birds.

STRATEGIES SUGGESTED FOR INCREASING MEAT AND EGG PRODUCTION ARE:-

(A) SMALL BACK-YARD POULTRY UNITS :

As per the breeding policy for bringing about genetic improvement in local poultry birds, a unit of 23 pullets and 2 cockerels (of 8 week old age) of improved breed like Giriraj and Vanraj will be supplied on 50 percent cost subsidy to women members of SHGs and members from BPL groups. Cost per unit amounts to Rs. 800/-. Total number of beneficiaries will be 200 women members from each taluka. Thus, total 9000 beneficiaries from the district during the Plan period. This will help in increasing the number of improved breed poultry birds and thus will enhance the growth rate of egg production. Budgetary provision required is indicated in the appended Profile of a Project.

(B) SUPPLY OF HATCHING EGGS :

Deshi hens are available with small farmers and even with landless labourers. These hens are broody every 6 months and can hatch out 9-10 chicks each time. This is most economical way of getting chicks hatched out-particularly when hatching services are not available. Hence, eggs from genetically improved breeds will be supplied to small marginal farmers and women members. Their Deshi hens will help in getting these eggs hatched out at very nominal cost. Thus, it will result in enhancing the growth rate of egg and meat production. Under this scheme, 20 lakh hatching eggs of improved breed will be supplied on subsidy cost basis. Budgetary provision required is indicated in the appended Profile of a Project.

(C) TRAINING CAMPS :

Training camps will be organized at frequent intervals in all talukas for women members from SHGs, farmer-labourers etc. These training camps will impart practical training to educate the participants for adopting scientific practices in poultry rearing, feeding etc. On completion of training programme successfully, the participants will be given certificates. This will further help them to get loan from the cooperative banks. By this way more and more number of personnel will be entering into this business and thereby more poultry birds will be getting added to the poultry population. All, this is aimed at enhancing the growth rate of eggs and meat production. Budgetary provision required is indicated in the appended Profile of a Project.

(D) SUPPLY OF POULTRY FEED :

The major constraint in the poultry development is the cost of feed, which accounts to 80 percent of the total expenditure. To overcome this problem and to help in achieving sustainable growth in poultry farming, the poultry feed will be supplied at 50 percent subsidy cost to the beneficiaries of all the schemes proposed.

For this Poultry Feed depots will be established at each taluka place, where poultry feed will be made available at 50 percent subsidy cost basis. Remaining 50 percent cost may be recovered from the sale of meat and eggs produced by the producers-beneficiaries. Budgetary provision required for the scheme is indicated in the Profile of a Project.

(E) PRICE CONTROL POLICY FOR MEAT AND EGG :

At present prices of meat and eggs are controlled by Egg Marketing Co-ordination Committee at State Level. It is observed that there is always fluctuation in the prices of eggs as well as of poultry meat. Hence, policy should be framed out to see that the prices are assured to the producer all round the year, on lines with Agricultural produce like cotton etc.

(F) DISEASE CONTROL AND HEALTH COVER :

To avoid major losses in poultry industry, it is very important to have regulation and control on the dealing with epidemics of poultry diseases, like Bird Flue and Avian Influenza etc. For this the district diagnostic centre should take care of Sero-monitoring and Sero-serveillance work regularly. It is also important to ban illegal movements of poultry birds entering from affected districts. For this quarantine stations be located around district borders. Regarding vaccination of poultry birds and other health cover etc, details have been appended in a separate note on Disease Control and Health cover of Livestock.

(G) STRENGTHENING OF INTENSIVE POULTRY DEVELOPMENT CENTRE:

As per, the Government policy, State owned farms and hatching centres be established at the district for maintaining foundation stock of selected genetically improved bird breeds and to supply male birds, pullets, day old chicks and hatching eggs etc, available for breeding / multiplication at farmers end. The Intensive Poultry Development Centre was established at Parbhani in the year 1965. However, it is reported that the same is not in operation to its fullest extent and needs immediate strengthening. Budgetary provision required is indicated in the appended Profile of a Project.

Thus, with all these multi pronged approaches and systematic well planned strategies, there will be significant increase in genetically improved poultry population, which with better rearing, feeding and disease control programmes etc, will result in enhancing the growth rate of meat as well as egg production to 6 percent.

LIVESTOCK HEALTH CARE AND DISEASE CONTROL

Since, long efforts are being made to control diseases viz. Rinderpest, Foot and Mouth, H.S., B.Q. and Anthrax etc. Although, Rinderpest have been eradicated out from the country, yet prevalence of the other disease continues to be one of the major problems in the animal production programme. Some of the emerging diseases like PPR, Blue Tongue, Sheep Pox, Goat Pox, Ranikhet and Bird Flu etc. are causing substantial economic losses. There should be an effective surveillance and monitoring system for diseases. There should also be mass immunization programmes against the most prevalent diseases.

At present, Veterinary Services are provided through district Veterinary Polyclinics at district head quarter, mini polyclinics at taluka level and grade I and II dispensaries in muffasil areas. Thus, the present Veterinary aid is provided by 85

Veterinary Institutes in the district (Vide Table No. 5.18). Veterinary health care is being rendered for:-

(a) Treatment of ailing animals, which includes clinical diagnosis of the diseases, medicament and surgical interventions.
(b) Prevention against infectious diseases by carrying out prophylactic vaccination amongst all the species of Livestock.
(c) Diagnosis of diseases with the help of Laboratory investigations.
(d) Deworming against parasitic diseases.
(e) Ectoparasite eradication to control economic loss.
(f) Reproductive programme like Artificial Inseminations, Pregnancy Diagnosis, Infertility and allied problems.
(g) Medico legal or Veterolegal cases, and
(h) Emergency problems like out brakes, poisoning cases etc.

Apart from these activities, Veterinarian has to participate in Animal Husbandry extension programme like training programme, Infertility camps, Livestock shows etc.

District Polyclinic is not provided with a diagnostic aid like X-Ray unit for radiological analysis of the problem cases. The some may be provided immediately. Though, Diagnostic Laboratory is established at district Polyclinics, there is no laboratory technician available for undertaking laboratory work. Further, this diagnostic laboratory needs to be modernized / strengthened by providing diagnostic equipments viz. Auto analyzer, Serum testing kits, chemical / biochemical estimation kits and for diagnosis of poisoning cases, the toxicological testing kits also be provided. In certain infertility problem cases, ultra-sonography equipment will have to be used. The same may also be provided. Provision required is indicated in the appended Profile of a Project.

Prophylactic vaccination against diseases like Black Quarter, H.S., E.T.V.R.P., Sheep Pox, Food and Mouth disease etc, can be entrusted to Pashu Sevaks also, who will be employed for carrying out door step Artificial Inseminations work. By this way, maximum number of livestock will be getting protected as the existing available staff will get assistance without any additional financial burdon. Thus, strengthening Veterinary polyclinics will help in providing quality Veterinary Health Services. As suggested in a note on A-I work, all the Veterinary Staff may be provided Rs. 2000/- each per month as conveyance allowance, so that the staff can reach to the livestock at their door step as and when required immediately and conveniently.

Endemic Chart of infectious diseases should be strictly prepared every year. Prophylactic vaccination under these areas on first priority basis should be undertaken before onset of Monsoon Season. Rest of the area or adjoining areas should be covered later. Prophylactic vaccination en-mass can also be undertaken in all cattle markets in the district.

Generally, villagers do not come out for vaccination unless there is an epidemic. It is therefore, suggested that wide publicity through media be undertaken either through Government or NGO Services. This will promote farmer-breeders to get their animals vaccinated.

It is generally observed that farmer-breeders avoid treating their new born calves particularly male calves. All new born calves, irrespective of their sex should get immediately colostrums, which provide immunity against various diseases. Another important problem in these calves is that of worn infestation, either congenital or acquired. Deworming programme should be undertaken at regular intervals by using effective anthelmentics.

In order to meet the reproductive problems effectively, regular Gynoecia-clinical examination is a must. In certain cases blood samples for hormonal assay as well as other estimations may be carried out. Ultra-sonography of infertility problem cases – particularly of high yielding animals will also have to be carried out for better diagnosis and effective treatment. At times, expert opinion may be made available from Veterinary Colleges.

A large area in the district has come-up under sugarcane plantation. It is observed that farmer-breeders are feeding their animals sugarcane tops. This is resulting in coffee colour urine- Heamoglobinurea disease, particularly in buffaloes. Hence, buffalo owners will have to be educated to feed sugarcane tops only after treating with phosphorus.

MASTITIS :

Bad handling procedures of stripping milk coupled with unhygienic conditions lead to Mastitis problem in milking animals. It is hazardous disease and as there is considerable reduction in milk yield resulting in economic loss. Quick diagnostic test reagents with required equipments have been provided at most of the Veterinary Institutes. Mastitis detecting reagents should be supplied regularly and special Mastitis detection programme should be organized at frequent intervals.

FESIOLOSIS :

In some parts of the district, there are irrigation projects like Eldari and Purna etc. In this area, Fasiolosis problem through liver flukes do occur. It brings about morbidity and mortality in young calves and sheep, leading to economic loss to the farmers. Natural prevention of Fasiolosis can be possible if duck rearing programme is implemented in such areas. Ducks reared just eat away snails and thus help in prevention of disease. Treating boundaries of tanks and river beds with copper sulphate can also reduce incidence of the disease.

RABIES :

Now a days dog population in city area has increased. If these dogs are not cared for – particularly vaccinated against rabies, it will result in incidences of Rabies

in the areas. Rabies prevention can be effectively done by undertaking vaccination of owned as well as of stray dogs.

To control increased population of dogs, dog breeding control programmes should be undertaken with the cooperation from NGO like SPCA organization etc. This will result not only in controlling the dog population, but will help in reducing the Rabies problem from untreated dogs.Thus, multi-pronged approach for disease control and health care will result in well being of the livestock and help in giving boost to their production i.e. of Milk, Meat, Wool, Egg and Poultry Meat too.

Table 5.9
Showing Taluka-wise Cattle and Buffalo population in Parbhani district
(2013 livestock census)

Sr. no.	Taluka	Cattle		Total	Buffaloes
		Cross-bred	Indigenous		
1	Parbhani	4847	74445	79292	49419
2	Purna	679	38668	39347	12341
3	Palam	2216	23870	26086	8746
4	Gangakhed	1244	36834	38076	16031
5	Sonpeth	439	30630	31069	12431
6	Sailu	1302	34865	36167	7916
7	Pathri	1067	26203	27270	8328
8	Manwat	518	22060	22578	5097
9	Jintur	2259	65579	67838	15216
	Total	**14571**	**353154**	**367723**	**135525**

Table – 5.10
Showing Taluka-wise Sheep and Goat Population in Parbhani district

(2013 livestock census)

Sr. no.	Taluka	Sheep	Goat	Total
1	Parbhani	5768	36792	42560
2	Purna	2506	24370	26876
3	Palam	1902	11450	13352
4	Gangakhed	4930	27174	16380
5	Sonpeth	3246	24169	27415
6	Sailu	775	15996	16771
7	Pathri	1886	14110	15996
8	Manwat	1472	9577	11049
9	Jintur	479	29106	29585
	Total	**22964**	**192744**	**215708**

Table 5.11
Showing Taluka-wise poultry population in Parbhani district

(2013 livestock census)

Sr. no.	**Taluka**	**Poultry Population**		**Total**
		Improved	**Indigenous**	
1	Parbhani	8308	34172	42480
2	Purna	208	18044	18252
3	Palam	0	18510	18510
4	Gangakhed	710	31368	32078
5	Sonpeth	8800	19079	27879
6	Sailu	252	11900	12152
7	Pathri	297	15972	16269
8	Manwat	0	9703	9703
9	Jintur	1359	30115	31474
	Total	**19934**	**188863**	**208797**

TABLE NO – 5.12
Table Showing Year-wise Projected Production and its Value in Parbhani District

(At constant price)

Sr. No.	Commodity	Base year		1st year		2nd year		3rd year		4th year		5th year		CGR
		Prod.	Value	Prod.	Value	Prod.	Value	Prod.	Value	Prod.	Value	Prod.	Value	
1	Milk (Value @ Rs.10 / Litre)	2.8 M.T. (lakh)	Rs. 280 lakh	2.95 M.T. (lakh)	Rs. 295 lakh	3.20. (lakh)	Rs. 320 lakh	3.35 M.T. (lakh)	Rs. 335 lakh	3.50 M.T. (lakh)	Rs. 350 lakh	3.80 M.T. (lakh)	Rs.380 lakh	6.3
2	Meat (Value @ Rs.60 / Kg)	1560 M.T.	Rs. 936 lakh	1700 M.T.	Rs. 1020 lakh	1850 M.T.	Rs. 1110 lakh	1950 M.T.	Rs. 1170 lakh	2050 M.T.	Rs. 1230 lakh	2100 M.T.	Rs. 1260 lakh	6.1
3	Wool (Value @ Rs.10 / Kg)	13 M.T.	Rs. 130 lakh	14 M.T.	Rs. 140 lakh	15 M.T.	Rs. 150 lakh	16 M.T.	Rs. 160 lakh	17 lakh	Rs. 170 lakh	18 M.T.	Rs. 180 lakh	6.7
4	Eggs (Value @ Rs.150 / 140)	132 lakh	Rs. 198 lakh	140 lakh	Rs. 210 lakh	150 lakh	Rs. 225 lakh	160 lakh	Rs. 240 lakh	170 lakh	Rs. 255 lakh	180 lakh	Rs. 270 lakh	6.4
5	Poultry Meat (Value @ Rs.40 / Kg)	200 M.T.	Rs. 800 lakh	210 M.T.	Rs. 840 lakh	220 M.T.	Rs. 880 lakh	230 M.T.	Rs. 920 lakh	245 M.T.	Rs. 980 lakh	260 M.T.	Rs. lakh	6.2

Table No.5.13

Showing Projected Increase in Production and its Value in Parbhani District

(At constant price)
(Rs. in lakhs)

Sr. No.	Commodity	Production (Base year)	Production (Final year)	C.G.R
1	Milk (value@Rs.10/litre)	2.8 M.T. Rs.280 lakh	3.8 lakh litres value Rs.380 lakh	6.30
2	Meat (value@Rs.60/kg)	1560 M.T Value Rs.936 lakh	2100 M.T Value Rs.1260 lakh	6.13
3	Wool (Value@Rs.10/kg)	13 M.T Value Rs.130 lakh	18 M.T Value Rs.180 lakh	6.72
4	Eggs (Value@Rs.150/100)	132 lakh Value Rs.198 lakh	180 lakh Value Rs.270 lakh	6.40
5	Poultry Meat (Value@Rs.40/kg)	200 M.T Value Rs.800 lakh	270 M.T Value Rs.1080 lakh	6.18
	Total Value	**Rs.2344 lakh**	**Rs.3170 lakh**	**6.22**

TABLE 5.14

Department wise New Schemes proposed Rs.in Lakhs (Stream-I)

	Animal Husbandary	Production and Growth	2014-15	2015-16	2016-17	Total
1		A.I.D Delivery System Under RKVY	0.00	100.00	50.00	150.00
2		Clean milk Production Through Supply of milking machines to farmers on 25 % Subsidy	0.00	100.00	50.00	150.00
3		Assistance to farmers for promotion of integration livestock farming on 25 % subsidy		625.00	625.00	1250.00
4		Distribution of fodder seed	0.00	15.00	15.00	30.00
5		Estabishment of silase making unit	0.00	30.00	30.00	60.00
6		Fodder production from fallow land	0.00	30.00	30.00	60.00
7		Estabishment of Hydroponics fodder production unit	0.00	15.00	15.00	30.00
8		Estabishment of A.Azolla production unit	0.00	15.00	15.00	30.00
9		Distribution of 40 female and 2 male goat in DPAP Area	0.00	1.94	0	1.94
10		Estabishment of silage making unit in Drought affected districts under RKVY as drought mitigation measurment	0.00	31.50	0.00	31.50
11		Stall fed 40 + e goat unit by punyashlok ahilyabai Maharashtra mendhi vasheli vikas mahamandal	0.00	42.00	42.00	84.00
		Total	0.00	1005.44	872.00	1877.4

12	Animal Husbandary	Infrastructure and asetes	2014-15	2015-16	2016-17	Total
13		Estabishment of gokul gram under Rashtriya gokul mission	0	500	500	1000
14		Eastabishment of mobile extension centers for publicity of govt. schemes of creation of awareness among farmers at distr. level	0	100	50	150
15		Mobile marketing units for poultry		100	100	200
16		Facilitating market linkage for live birds animals subsidy ceiling Rs.2.00 lakh /unit	0	100	100	200
17		Introduction of power driven chaff cutter	0	30	30	60
18		Modernization of veterinary despensaryies Gr. 1 for online data entry	0	20.85	20.85	41.7
		Total	0	850.85	800.85	1651.7

Table 5.15
Department wise New Schemes proposed Rs.in Lakhs (Stream-I)

		Infrastructure and asetes	2014-15	2015-16	2016-17	Total
19	MAHARASHTRA ANIMAL AND FISHERY SCIENCE UNIVERSITY COLLAGE OF VETENARY AND ANIMALS SCIENCE	Extending technologies to rural poor through improvement of fertility and productivity of dairy animals	0	106.4	710	816.4
20		Strenthening and Modernizaton of Teaching Veterinary Clinical Complex Diagnostic laboratory and estabilshment of training centre at Collage of Veterinary & Animal Sciences, Parbhani	0	70.7	386.75	457.45
21		Modernization of Department of Vetaerinary Medicine, COVAS, Parbhani	0	399	0	399
22		Mobail Veterinary Diagnostic & Telemedicine center	0	973	0	973
23		Enhancing livelihood through Clinical Investigatory of Livestock at Parbhani	0	57.44	12.44	69.88
24		Establishment of experential learning cum training unit	0	82	49.5	131.5
25		Eastabishment of Necropsy Center	0	152	7	159
26		Eastabishment of poultry trining center for low input technology with improved poultry breed in parbhani district of maharashtra state	0	275	85	360
		Total	0	2115.54	1250.69	3366.23

Table 5.16
Department wise New Schemes proposed Rs.in Lakhs
(Stream-I)

			2014-15	2015-16	2016-17	Total
Infrastructure and asets	Dairy Development	Supply of khoa/ paneer making machine to milk Producer	0	25	30	55
Production and Growth	Dairy Development	Supply of improoved milch animals under Marathwada Vikas Package Yojana.	0	75	75	150
Total			0	100	105	205

5.5 FISHERIES DEVELOPMENT IN PARBHANI DISTRICT:

Table No. 5.20 shows the source-wise water spread area in Parbhani district. There are 130 Departmental tanks with a total water spread area of 36230 hectares. Talukawise distribution is not available is not available. Projections for fish production, seed to be stocked and hatchery requirement for XII plan.

a) Fish Production: The Production of fish at different yields from different areas is shown in the table. In 2007.08, the total fish production was 5480 metric tones; and it is projected to increase to 6780 mt. in 2011-12.

b) Seed to be stocked advance fingerlings 50 mm. size (in lakhs) is also shown in this table. Its production is to be increased from 79 lakhs to 225 lakhs over the XI Plan period.

c) Hatchery required on the assumption of 0.6 ha. Of hatchery can produce 20 lakh fingerlings and 40 lakh fingerlings required per hectare.

1) Fish Production :
2007-08 = 5480 metric Tonnes } Growth rate
2011-12 = 6780 MT.
5.46%

2) GVA at constant Price (Rs. Lakhs):
2007-08 = 16440 lakhs } Growth rate
2011-12 = 20340 lakhs
5.46%

Table 5.17
Department wise **NEW** Schemes proposed Rs.in Lakhs (Stream-I)

DISTRICT :- PARBHANI					
Name Of Department	Scheme proposed (Stream-I)	**Year**			Total
		2014-15	2015-16	2016-17	
	2	4	5	6	7
Fisheries	Integrated fish Development Project through proper transport, Marketing facilities,Cold storage	0	90	90	180
	Total	**0**	**90**	**90**	**180**

FINANCIAL REQUIREMENT DURING XI PLAN :

Table no. 65 shows the projected outlay for fisheries development during the XI plan period. There are six schemes proposed with a total outlay of Rs. 590.39 lakhs . Annual outlay is also shown in this table.

Table no. 5.18
Source wise Water Spread Area (WSA) in the District

	Taluka	**Gram Panchayat Tanks**		**Department Tanks**		**Reservoirs**		**Rivers**	
		< 40 ha		**< 40 ha**					
		No.	**W.S.A .(ha.)**	**No.**	**W.S.A .(ha.)**	**No**	**W.S.A .(ha.)**	**No.**	**W.S.A .(ha.)**
1	Parbhani	0	0						
2	Purna	0	0						
3	Palam	0	0						
4	Gangakhed	0	0						
5	Sonpeth	0	0						
6	Sailu	0	0						
7	Pathri	0	0						
8	Manwat	0	0						
9	Jintur	0	0						

	Total	0	0	130	36230	0	0	0	0

Table no.5.19
Projections for fish production, seed to be stocked and
Hachery Requirement for XI Plan

a) Fish Production (in Tonnes)				
Year	Production at different yields from different areas			
	@ 2000kg/hect for 500 hect	@ 500kg/hect for 2000 hect.	@ 100 kg/hectare 6000 hectare	
Present	750kg/ha			
2007-08	5300	**180**	0	5480
2011-12	6478	302	0	6780
b) Seed to be stocked advance fingerlings 50 mm size in lakhs				
Present				
2007-08	79	0	0	79
2011-12	210	15	0	225
Table H : Hatchery required (Assumption 0.6 ha of hatchery can produce 20 lakh fingerlings and 40 lakh fingerlings required per ha)				
Present				
2007-08	**56**	**0**	**0**	**56**
2011-12	**225**	**0**	**0**	**225**
Source ;	Tree Fish Seed Production Units & Pvt Co. Societies			

FISHERIES : FINANCIAL TARGETS AND ACHIEVEMENTS DURING XI PLAN PERIOD.

Table no. 5.15 shows the fisheries development in Parbhani district during the XI plan period. There are 5 major fisheries development schemes which were executed in the district during 2002-03 to 2006-07. As no target are indicated by the Fisheries Dept; we have presented only achievements of these 5 schemes. The performan ce of these schemes could not be ascertained. Seed production centres have been established with a total cost of Rs. 590.39 Lakhs cost of other schemes is shown in the table.

Table no. 5. 20
Financial Targets and Achievement during X Plan for
Fisheries Development in the District.

Sr. no.	Scheme	2007-08		2008-09		2009-10		2010-11		2011-12	
		Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
1	Fish Production Centre		13.64		14.51		19.99		18.31		18.89
2	Fish Improvement subsidy to Fishery nets		1.45		1.07		0.65		1.4		1.12
3	Development co.op Fisheries		0.45		0.26		0.47		0.34		0.54
4	Fish Development establishment		0.40		0.31		0.34		0.25		0.21
			1.07		1.30		0.14		0.145		0.94

Table no.5.21
Projected Outlay for Fisheries Development during XII Plan

Sr. No.	Name of the Schemes	Years					Total
		2012-13	2013-14	2014-15	2015-16	2016-17	
1	Fish Production Centre	1.00	16.00	16.00	16.00	18.00	67.00
2	Fish improvement	1.63	87.70	87.70	87.70	87.70	352.43
3	Subsidy to Fishery nets, equipment	1.10	10.00	10.00	10.00	11.00	42.10
4	Development of Co-op Fishery	0.34	10.00	10.00	10.00	10.00	40.34
5	Strengthning of Fisheries Development	2.52	3.00	3.50	4.50	5.00	18.52
6		0.00	17.00	17.00	18.00	18.00	70.00
	Total	6.59	143.70	144.20	146.20	149.70	590.39

5.6 INNOVATIVE SCHEME: I: SECTION (5.8) AGRO BASED RURAL DEVELOPMENT PROGRAMME:

(ORGANIZING ASSET - POOR - FARMERS FOR CRITICAL AGRO - SERVICES)

Our focus, in this section of the chapter, is on organizing the small and marginal farmers as well as the landless labourers in each village into one or more self-help-

groups and helping them through good training and adequate credit to provide to all the farmers various services, which are critical to agricultural development. Those services will help to improve the productivity of all lands including their own small farms. The wages for the services rendered will improve the earnings of these asset poor farmers. The strategy is to upgrade their skills, add to their meager incomes and to improve their capabilities and self-confidence while rendering critically useful services to the village community. Because agriculture is in trouble, through this programme, we try to convert the perceived weakness of small non-viable farms into strength by transforming these set-poor-farmers into viable service providers who would be simultaneously improving the viability of their own small farms through those services and other inputs.

This is an unique approach. It attempts to combine poverty reducing strategies with the strategies of raising agricultural production. This combination should mean a real constructive rural development revolution. The small farmer's groups, thus, helping rejuvenation of agriculture will have a significant socio economic impact in rural areas. The programme is based on the assumption of the inherent goodness among the rural poor and the natural human instinct of helping each other.

The term "Farmer" is used here in a broad sense as defined in the National Policy for farmers 2007. It includes operational holders, tenants, agricultural labourers as well as those engaged in activities related to farming. It does include most members of the scheduled castes, scheduled tribes and other weaker communities.

The lands held by the small and marginal farmers are mostly degraded because they have not been deep ploughed for decades and on account of poverty, the farmers have never been able to apply any organic manures or fertilizers. The small farmers themselves have to work as agricultural labourers on other's farms and are often unable to give any attention to their own crops. The small size of their holding is un-economic and non- viable and because of the high prices of fodder the small farmers can not even afford to keep a pair of bullocks.

The ownership of land in this district, is skewed. The proportion of farmers owning less than two hectares of land is 53.7 % but the land they hold is only 23.1 %.

Their small farming is always dependent on some one else's assistance and does not provide any significant support for subsistence. In short. 60% of the farmers are living at bare existence levels and 30% of all the lands hardly makes any contribution to the growth of agricultural production.

These asset poor or asset less farmers are naturally the most vulnerable section among the rural people. They are at or below the minimum levels of education, health, nutrition and well being. Principles of equity and social justice demand that an allout effort should be made to pull up these sections of the society to a level of well being at which they may live and work with dignity and contribute to the development of the

society as a whole. We are proposing one way of doing it. It is easily adaptable to the socio- economic and agronomic conditions of each village.

ORGAINSATION:-

i) Development and extension agencies of all government departments. Panchayat Raj Institutions, especially the district Rural Development Agency, as well as all Banks and NGO's would promote formation of self - help - groups of asset poor farmers in every village. Membership may be 15 - 20 and a village may have two or more SHG's. There would be a federation of SH G/S if there are four or more SHG's in any village.

ii) If the concerned members agree and desire an existing SHG may associate new members by enlarging its size as well as functions.

iii) A farmer who is not himself asset poor may be enrolled as a member of the SHG if he needs its services or if he wants to support the working of the SHG. He may be called a progressive farmer member.

iv) SHGs should, between them, cover all asset poor or asset less farmers. No eligible farmer should be left out.

v) For distinguishing from the SHG's formed earlier for savings from the freshly formed SHG's the new units may be called SHG'PPFS. the first "P" symbolising the poor and the second "P' the progressive farmers. This may be done unless the financing institutions find it difficult to extend or apply their present liberal lending policies because of that new name.

vi) The formation of SHG/PPFS should be completed in a mission mode. The plan should be to cover at least 10% villages in the first year, upto 25% in the second year, upto 45% in the 3ld year, upto 70% in the fourth year and one hundred percent villages in the fifth year. The coverage of asset poor or asset less farmers will also be simultaneously improved to 100% in the five years.

i) The District Rural Development Agency (DRDA) is eminently suited for undertaking the activity. It has been promoting SHG's, though mostly of women to mobilize savings. The DRDA itself has been formed by merging integrated rural Development Project (1RDP) and small and Marginal farmers and Agricultural Labourers Scheme (SMF & AL). Moreover^it has an established organizational set up like the Governing Body, the Executive Committee, a Project Director, an office establishment and working relationships with Panchayat Samities, Banks and NGO's. Formation and activating SHG's of asset poor or asset less farmers is not any new or different programme for DRDA. It is an intensification of what it has been doing for years but with a purposive focus on the targeted groups and their creative activities and of course , on results.

ii) The DRDA of Parbhani district has presently, a target of forming 200 SHG's per year. Field work is done through NGO's or individuals who are paid a commission of Rs 10,000 per SHG in four instalments, on completion of four stages of work of formation and activisation of the SHG.

iii) Out of 3.65 lakh rural families in the district 30.8% or 1.12 lakh families are below povery line (BPL) about one half of SHG's are promoted by NGO's other than Anganwadi Tars on the same rates of commission. This work has been going on from 1991.

iv) Obviously the annual target given to the DRDA is too small. It will take more than eighteen years to accomplish hundred percent coverage. The proposal now is to cover all (100%) asset poor and asset less farmers In the next five years. We propose that

a. the annual target should be raised by four fold i.e. it should be 800 per annum or 100 SHG's per taluka per annum,
b. DRDA's budget grant for payment of commission should be raised to 80 lakhs per annum,
c. The grassroot workers from agricultural extension services should also promote these SHG's; and allowed to draw commissions paid as the Anganwadi Tars are.
d. Assuming each asset poor or asset less family to send one member to the SHG, the total membership of SHG's in the district works out to 1.12 lakh. That makes overall target for training for various agro services and agro enterprises to cover 1.12 lakhs asset poor farmers in five years. With nine talukas in the district, the taluka wise target would come to 100 SHG's or 100 training classes of 25 each,
e. We are presenting in para 5.08.10 below critical agro services which these SHG's may undertake and for which they are to be trained. Similarly a list of small enterprises which those groups may undertake on commercial scale is given below in para 5,08.11.
f. Panchayat Samities should be assigned the responsibility of formation and acivisation of SHG's under the guidance and funding from DRDA.
g. One Assistant Project officer for each block should be given to DRDA and two APO's in DRDA's office exclusively for this work. DRDA should be made responsible for organizing these poor groups in SHG's and for preparing them to function as providers of services and commodities so crucial for agricultural growth
h. The KVK Parbhani should be given tasks of designing the course contents of the ; training and selecting , appointing and training of the trainers.
i. A provision of Rs 10.000 should be made for each training camp of SHG members to cover booklets, demonstration materials and other expenses. Taluka seed farms should be the most suitable locations for training camps and demonstrations
j. An abstract staffing and costing proposal as a project is presented in the appendix 5.08.A at end of this section (page no .....).

5.08.10 Kinds of agro services to be rendered to own farms and to the other needy Farmers:-

1) Assistance in ploughing, sowing and any other farming operations;
2) Assistance in procuring and applying agricultural inputs of purity, i.e. seed, seedlings, soil nutrients, fertilizers, organic manures, pesticides.

3) Assistance in systematically collecting soil samples, taking them to soil testing labs, obtaining cards and advice on soil enrichment and assisting in applying that treatment.
4) Assistance in identifying crop diseases and in applying appropriate treatments.
5) Assistance in harvesting - produce and in primary processes of clearing, washing, grading, packaging, storage or marketing.

5.08.11 Kinds of micro- enterprises

1) Keeping tools. Implements, oil engines, pumps, sprayers, machinery, draft animals and other equipments for custom hiring or providing services with them;
2) Keeping stocks of seeds, seedlings fertilizers or pesticides of assured purity for sale to the farmers or to provide services by applying them.
3) Collection of milk and its transport to the collection centres.
4) Enterprises - activities on commercial lines.

a. Composting village or urban area solid wastes
b. Vermi- culture
c. Nurseries
d. Digging of wells
e. Digging of farm- ponds
f. Development of Waste lands
g. Tractor ploughing or goods transport.
h. Seri- culture or beekkeeping on their own holdings or those of the other farmers.
i. Simple repairs or additions to rural houses
j. Sulabh latrines, Gobar gas plants or other civil works for the panchayats
k. Rearing livestock, poultry or goats
l. Bio - DYNAMIC FARMING
h. Any other activity useful to the village community.

Notes:-

i) Every SHG may not undertake all the above activities or enterprises; each farmer may not need all those services form SHG's.
ii) SHG's may decide wage - rates for the work done by members or others,
iii) Prices for the services should be fair, both to the providers and to the clients. There should be some mechanism or institution to arbitrate in case of conflicts,
iv) There should be some arrangement through the banks for payment of wages and debiting the price of services to the accounts of clients availing of those services.

The SHG's would need working capital from very early stages of their activities. Banks have been supporting SHG's for such activities though on smaller scales. Several SHG's have even bought tractors and other machines with bank loans. Fresh initiatives both from State Government and Banks appear to be under process for further liberalization and lowering of interest rates. SHG's with BPL members or having sc/st members would be entitled to subsidies under various schemes. The state Government should pay special attention because Maharashtra is lagging behind in this new revolutionary system of Micro Finance, while States like Andhra Pradesh, TamilNadu have made tremendous progress.

With increasing volume of micro-finance, several Bank offices appear themselves working under stress, because of shortages of staff. The proposed campaign would add much more work and the bank offices should be strengthened to meet it.

The SHG's of the earlier generation were basically entities for savings and borrowings. But today, SHG's in many parts of the country and especially in the four southern states have taken up new roles and responsibilities. Their activities are now more related to the very core of the livelihood security of the poor. Those desirable roles have made the SHG's as institutions of social capital.

The SHG movement has expanded in Andhra Pradesh spectacularly. 80 lakh women have been mobilized in just 15 years. 26% of the country's SHG's are in Andhra Pradesh and of the loans given by the banks to SHG's all over the country, 40% are in Andhra Pradesh. Thses loans constitute 6% of total rural credit of the country and 24% of total lending by RRB's and cooperatives. It may be noted that a little over half of the SHG's in Andhra Pradesh have been promoted by the State Government, less than a third by NGO's and the balance by Banks.

In 2004, the newly installed (Congress) Government declared its commitment and support to the programme for promoting SHG's with world Bank support launched by the predecessor Government in 2000. A new name of Indira Kratiti Patham (IKP) was given to that programme. IKP is managed by an independent Society for the Elimination of Poverty (SERP). That society employs 2200 professionals across the state who provide administrative and managerial support to the entire SHG network. That network consists of 29000 village orgainsations (VO's are Village wise Federations of SHG's) 1000 Mandal organisations and 22 district orgainsations. They are all registered as Mutually Aided Co -operative Societies (MACS). These MAC's are said to be a great innovation for it eliminates both political and bureaucratic control over the cooperatives.

Many high ranking Indian and foreign dignitaries have been highly impressed with the progress and work in Andhra Pradesh. We should learn from each other and replicate what Andhra Pradesh has done in Maharashtra. The SHG's have certainly shown a way and a great possibility of poverty elimination programmes to be undertaken through the SHG's of the poor. Our proposal of organizing asset poor farmers for rendering critical services and inputs fits in perfectly with both the objectives of poverty elimination and acceleration of agricultural growth and development. It would usher in a creative social revolution in the rural society.

5.9-5.10 AGRO AND FOOD PROCESSING UNITS IN PARBHANI DISTRICT

INTRODUCTION

The diversity of climate and different types of soils enables cultivation of about 30-35 types of fruit crops, 20-30 types of vegetables and 15-20 types of flowers in Maharashtra. But hardly 1% of the horticulture produce is processed in the state. The

major crops like Jawar, paddy, Bajary, Cotton, ground nut, Tur; and fruit crops like, Mango, Oranges, Grapes, Pomegranate, Banana, cashew nut, Custard Apple, Chikoo, Jamun, Bor etc. and vegetables like onion, tomato, brinjal, potato, cabbage and cauliflower are suitable for processing.

Present fruit and vegetable processing capacity is about 1 lakh metric tone in the State. The capacity utilization of medium and large scale units in the State is about 70%. The main processing units in the State are in the sectors of sugar, Poultry, Rice mills, Floor Mills, Edible oil, Meat, Vanaspati, Fruit and vegetables and milk processing units.

1. **Govt. Policy:**

The post harvest technology plays a crucial role in value addition to agriculture, and improves income and employment of the farming community. Considering these factors, the union Budget 2006-07, has provided high priority to this sector. The Govt. has set – up National Institute of Food Technology Entrepreneurship and Management; loans to agro/food processing sector by banks are treated as priority sector lending.

The Maharashtra Agro – Industries Development Corporation Ltd. is the Nodal Agency in Maharashtra to implement schemes of the Ministry of Food Processing Industry (FPI).

The role of NABARD is also important; in addition to refinance it publishes several model schemes like mango pulp processing, milk processing, production of papain from papaya latex, etc. Credit liked subsidy schemes are operated through NABARD, e.g. cold storage, onion godowns, rural godowns, production and post harvest management, strengthening agricultural marketing infrastructure, etc.

3) Assessment of Raw Material Base of Parbhani District:

The following table indicates the annual production of various crops in Parbhani district. It also shows the quantity of produce available for processing purposes, after their due consumption and crops losses. It is obvious from this table that there are huge surpluses of various crops available for processing purposes. For example, the following crop production has major surplus: Wheat 25% Jawar 30%, sunflower Gram, Tur, Urad, Moong, Sugarcane, Cotton – all 100%, Mango 9%, Guava 29%, Tamarind 20%, Aonla 43%, Ber 18%.

Table – 5.22
Production of Crops in Parbhani District

Sr.no	Type of crop	Productive Area in ha()	Annual Production (MT)	Productivity ha	Produce consumed in raw form (MT)	Produce Available for processing (MT)	% Surplus
1	**Food grains**						
	Wheat	41,100	390500	1460	75%	292875	25%
	Maize	1500	00	0	0	NA	NA
	Jawar	92100	84500	918	2460	25350	30%
	Bajra	7700	3900	562	6007	NA	NA
2	**Oilseeds**						
	Sunflower	3200	1800	579	-	All	100%
	Soyabean	68600	66400	969	-	All	100%
3	**Pulses**						
	Gram	1300	200	509	-	All	100%
4	Tur	50900	25900	510	25137	All	100%
	Urad	14500	5300	363	8712	All	100%
	Mung	38100	13100	344	1028	All	100%
	Sugarcane	6200	485000	75	-	All	100%
	Cotton	198000	272700	148	-	All	100%
5	**Fruit crops**						
	Mango	2000	-	3400*	13600	1400	9.33%
	Guava	658	-	12000*	3600	1500	29.41%
	Tamarind	2036	-	2000*	2000	500	20%
	Aonla	81	-	5000*	200	150	43%
	Ber	3195	-	15000*	22500	5000	18.18%

* For fruit crops productivity figures shown is State level data for 2002-03
For fruit crops productivity area is assumed to be 50%

Source Potential Linked Credit Plan 2008-09, Parbhani dist. NABARD P.73

In the light of the proposed target of 4% growth rate for agricultural sector during the 11th plan period, (2007-12), the production levels as well as productivity of major crops in the district is likely to increase. This will lead to further increase in surplus produce for establishing agro. and food processing units in Parbhani district. Let us now examine the present status of post – harvest agro-processing activities in Parbhani district.

4) **POST HARVEST AGRO-PROCESSING UNITS: PRESENT STATUS:**

i) According to the data available from the District Industrial Centre (DIC), Parbhani, there are 198 permanent registered units engaged in food /agro processing, as on 31-03-2006.

ii) As per the DIC data, there are 3 Dal mills, 8 oil mills, animal feed & 12 other food grain/pulses processing units in Parbhani district. Also there is one fruit processing unit, one cashew processing unit & 4 spices processing units in the district.

iii) Being cotton area traditionally, there are a number of cotton pressing and ginning mills in the district at Manvat, Jintur and Pethsivani Maharashtra State Oilseed Commercial Industrial Corporation ltd. (MOCICOL) having units at Parbhani & Gangakhed were producing cottonseed oil & sunflower oil, oil cake, cattle feed etc., but this unit which provided employment to many is not functioning.

iv) There are three sugar factories in the district of which two are non-functioning of there on leave basis by Purna sugar Factory during 2007. However Godawari Dudhana coop sugar Factory was non functional in 2006-07. As a sequel to problems encountered by sugar factories, jaggery units are likely to come up.

v) The agro processing units are engaged in activities like mini oil milling cum cake making, chilli powder, pickle & spice making, Raisin making, bio tech/organic fertilizers, ice candy, sugar confectionery, jaggery making, Poha mill and mini Dal milling etc.

vi) The MCED conducts annually 40 to 50 training programmes like EDP, DPSE, VTP and for PMRY activities. Of late it has started imparting a few training in Agro/food processing, Goat farming, Vermi compost, dairy based activities, floriculture etc. During 2005-06 MCED conducted, among others, 8 EDPs, 15 VTPs, etc.

vii) The district is witnessing an increasing trend in Soya bean production and hence scope exists for processing industries for Soyabean. No such units exist at present.

viii) Although the acreage and production of various pulse crops like Tur, Udad, Gram is quite appreciable there are just three Dal units in the district.

ix) District's climate is very conducive for development of all Horticulture crops and Mango, Pomegranate and custard apple.

ASSESSMENT OF POTENTIAL TAKING INFO ACCOUNT AVAILABLE INFRA – STRUCTURE FOR 2008-9:

Taking into account the availability of infra-structure facilities and also the national priorities, the realizable potential for the district for the year 2008-09, is estimated by the PLP Parbhani district, as shown in the following table 5.26

Table -5.23

POTENTIAL TAKING INFO ACCOUNT AVAILABLE INFRA –STRUCTURE FOR 2008-9

PLP 2008-09				
Sr, No.	**Unit cost**	**Physical Units**	**Financial Outlay**	**Bank Loan**
1	7.00	5	35.00	28.00
2	8.00	11	88.00	70.40
3	6.50	5	32.50	26.00
4	5.00	2	10.00	8.00
5	1.50	5	7.50	6.00
6	1.50	5	7.50	6.00
7	1.00	5	5.00	4.00
8	3.00	50	150.00	120.00
9	0.30	10	3.00	2.40
			338.50	**270.80**

Source: PLP Parbhani District, NABARD, 2008-09, P.76.

It is obvious from table-5.24, that bank loans form a major part of the total financial outlays for these activities. The proportion of bank support is 80% for dal mills, oil mills, soya mills, turmeric processing, bakery & confectionary, masala grinding units, cashew processing self help groups, jaggary making units, khoya/paneer making units respectively.

SCOPE FOR FUTURE DEVELOPMENT OF AGRO-BASED INDUSTRIES (PARBHANI)

We have pointed out in the earlier section that there is a large surplus of various crop produce for value addition through agro-based industries. Considering the 4% targeted growth rate set for agricultural production during the XI plan (2007-2012), the production levels as well as surpluses available for agro-based industries are likely to increase considerably. Hence, there is good scope for the development of agro-based industries in Parbhani district during the XI plan period.

1) Jawar: Jawar is one of the major crops of Parbhani district (Kharip and Rabi). The present surplus available for processing is 25350 MTs. There is a big scope or opportunity for processing Jawar for the production of glucose, starch, malt beer, alcohol/ethanol, which is a raw material for liquor industry, basic chemical industry (i.e. for producing ether, acetone, ethylene di-oxide, chloroform) and which is utilized for production of rubber, synthetic fiber, drugs, insecticides, etc. Ethanol is the main ingredient for production of petroleum and petro-products. Jawar is considered as one of the best and easily available raw materials in the district for production of industrial ethanol.

2) Sugar Cane: At present there are three sugar mills in the district. These sugar mills provide biogases, which can be utilized for power generation, manufacture of particle boards, paper, etc. The molasses can be used for the production of industrial alcohol, acetone, ethyl acetate, and ester, which is the basic raw material for chemical industries.

There are about 50 un-registered jaggery units existing using sugar cane. This number can be increased.

3) Soyabean: The area under Soyabean in the district is showing an increasing trend, which is now fetching better price. The surplus production of Soyabean in the district to-day is about 66400 MTs, which is available for processing. As of to-day, there are 5 units making use of Soyabean for value addition. There is a vast scope for setting up more units for processing Soyabean. There are number of products based on Soyabean like, milk, oil, cakes, etc. Its importance in human and animal diet due to its high protein contents and more oil contents is well recognized. It has a great medicinal value due to low carbohydrates and high percentage of unsaturated fats in maintaining cholesteral level and preventing heart diseases.

4) Dal Mills or Pulses : Although the acreage and production of various pulses in the district is quite appreciable, there are just three dal units. There is a wide scope for the establishment of dal mills with 10 to 15MT capacity per day. For this purpose, modern technology including SORTEX may be employed to manufacture high quality dals. For increasing the no. of dal mills, there is need to create awareness, knowledge and entrepreneurship among the farming community, and educated unemployed in the district.

5) Horticulture Crops: It is reported that Kesar Mango is being exported to some Western countries and Japan. This may lead to rising levels of incomes of the Mango growers in Parbhani district

Local variety of Mangoes can be utilized for setting up pickle, pulp and juice manufacturing units. As the development of the district mainly depends on agricultural produce, Govt. of Maharashtra has established Agriculture University with HQ at Parbhani. Its faculties/branches can be helpful for Agro based industries. Food technology dept. is very famous for its work on agro processing which can be brought into practice.

SCOPE IN ALLIED SECTORS – DAIRY/GOATERY:

i) The availability of quality goats, sheep in good number in the district provide scope for developing goat meat complex and packaged meat supply industries. They also can provide scope for hide business/tanneries and leather manufacture which has export potential too.

ii) The district in particular has good dairy activity and hence provides scope for milk processing for various milk products. The Khava and Paneer and Pedha making needs to be developed in a more integrated manner. Cluster approach with necessary marketing support will create sufficient employment and income for people.

PRESENT POSITION OF INDUSTRIAL AREAS, MARKETING ETC. PARBHANI

The Maharashtra Industrial Development Corporation (MIDC) provides basic infra – structure facilities by establishing industrial estates and providing water, electricity, common facility centers, establishing growth centres, mini industrial areas, etc. There are at present 3 MIDC areas in Parbhani district.

There are 300 plots in these areas. Similarly, the Marathwada Development Corporation has established industrial estate in the area of 3 ha with 9 sheds at Selu which has been identified as potential growth centre for industrial/non farm sector activities. However the number of units functioning is not commensurate with the infrastructure developed.

Limitations: There appear to be several factors which are inhibiting the industrial development of Parbhani district, they are :

i) Entrepreneurial abilities & risk bearing.
ii) Development of skills among workers and unemployed.
iii) Lack of capital.
iv) Exposure to outside world.
v) Limited urbanization.
vi) Knowledge base

Due to these limitations, there is hardly any large-scale industry, or Multi-National Corporation operating in the district. Therefore, to stimulate industrial development of Parbhani District, the above mentioned factors which are obstacles to the industrial development of the district will have to be answered and removed.

Marketing : There are at present nine Agricultural Produce Marketing Committees (APMCs) in the district. But the marketing infra-structure in Parbhani district is not well developed, and has hardly any impact on matters of networking of production for marketing or post harvest handling and processing etc.

Suggested Action Plan : To give an impetus to the industrial development of Parbhani district, the following medium term action plan is suggested.

a) **For Banks**

i) Close coordination between banks and DIC and agri department is required to identify the units and assessment of the actual investment / working capital needs of potential entrepreneurs.

ii) Banks should become more proactive and provide encouragement and guidance to potential entrepreneurs. They should provided adequate investment credit and working capital to industrial units and improve post sanction monitoring.

b) **For Government Departments**

For a backward districts like Parbhani there is a need to impart quality training of desired length and contents by the experts in the field and bring about attitudinal change in the farmers which is lacking the most.

i) The State Govt. should take effective measures so that Technology prescribed by CFTRI Mysore or other Research Institutions and Agriculture Universities reaches easily right up to the entrepreneur level through the conduit of DIC.

ii) Qualified and well equipped NGOs should come forward to organize Rural Entrepreneurship Development Programmes (REDPs) covering the

motivational aspects too. In association with banks / NABARD for the educated unemployed youth. The candidates imparted training under such REDPs be given preference under PMRY or similar Govt. Programmes.

iii) SHGs may be encouraged to take up micro entrepreneurs like cashew processing on a cluster basis so that the raw material can be taken up by SHGs or individuals in view of the spurt in the dairy activity in the district and support for the same under Venture Capital Scheme.

iv) Sizable area of the district is under cultivation of spices. Therefore scope exists for industrial units of agro-processing and packaging. A few specific EDPs needs to be conducted in the district.

5.11 AGRICULTURAL MARKETING

BASIC MARKETING INFRA-STRUCTURE FOR AGRICULTURE PRODUCE: (POST HARVEST MANAGEMENT) PARBHANI DISTRICT.

Parbhani district is an important producer of cash crops like cotton, sugarcane and Banana and food crops like, Jowar, Wheat, Soyabean and other pulses, and a number of fruit crops. The district needs various types of storage facilities for the benefit of the farming community. Institutional credit may play a major role in creating such facilities.

Marketing Facilities

There are 9 Main Markets, one each at 9 taluka places and two submarkets in Parbhani. They operate under the Agriculture Produce Market Committee.

i) Rural Godowns: There are a total no. of 33 rural godowns in Parbhani District, with a total capacity of 44068 MTs of this maximum 21 rural godowns with a capacity of 33213 MTs, are located in Parbhani Taluka alone (almost 75%). There are rural godowns in Gangakhed (2), Selu (1) , Manvat (6) and Jintur Taluka (3).

ii) Cold Storages Units: There is not a single cold storage in Parbhani district. We have suggested one cold storage unit of 1000 MT capacity for all the 9 talukas of the district, at the total cost of Rs. 360 lakhs in 4 years.

NEED FOR ADDITIONAL STORAGE CAPACITY:

i) Due to increasing or bumper crops of cotton and soyabean in the district, there is additional requirement of storage capacity of rural godowns. The farmers are realizing the benefits of godowns as a measure of storing the good in case of collapse in the market price of their produce. Secondly, the pledge finance is also getting popular among the farmers. Hence it is suggested that priority should be given to construct, storage godowns in those talukas where there is no such facility till now, i.e. Purna, Palam and Pathri talukas.

ii) For storage of fruit, fish, meat etc. cold storage facilities are essential. It is likely that horticulture crops are likely to increase under the National Horticulture Mission programme, and hence, one cold storage in each Taluka may be created during the XI plan period. This would facilitate marketing of fruits to distant cities fetching good prices to the farmers.

5.12 AGRICULTURAL CREDIT:
Role of the Lead Bank, Dist. Parbhani:

INTRODUCTION:

The role of Lead Banks in providing credit to productive sectors is very important for the economy of a district. State Bank of India is the Lead Bank for Parbhani district. Besides SBI, the following banks operate in the district & are sources of credit to the productive sector in Parbhani district:

i) Bank of Maharashtra.
ii) Bank of Baroda.
iii) Union Bank of India.
iv) Dena Bank.
v) Allahabad Bank.
vi) Andhra Bank
vii) Industrial Development Bank of India.
viii) Sangli Bank.
ix) Bank of Rajsthan.
x) Maharashtra Grameen Bank.
xi) Parbhani District Central Co-operative Bank.
xii) Marathwada Grameen Bank.

With reference to the resources available in a district, the Lead Bank prepares Annual Credit plan for that district. The State Bank of India's Lead Bank Department prepares Block Level Credit Plan for three sectors of the economy of Parbhani district.

These three sectors are:-
i) Agriculture
ii) Industry and
iii) Services

This plan is designed to help all the above mentioned banks operating in the district in fulfilling the credit needs of the people in the Parbhani district. The plan also includes various Govt. sponsored schemes like PMRY, SGSY, KVIB, etc.

PERFORMANCE OF LEAD BANK IN PARBHANI DISTRICT:

The performance of the lead bank under annual credit plan for the 3 years is presented in the following table.

Table 5.24
Performance of all Financial Institutions (Rs. lakhs)

Sr. No.	Sector		2009-10	2010-11	2011-12
1	Agri. Crop Loan	A P %	6793 8332 82	9007 11359 79	13603 14555 93
2	Agri. Term Loan	A P %	876 1210 72	1583 1646 96	972 3441 28
3	Industries	A P %	172 251 69	206 314 66	149 670 22
4	Services	A P %	2344 2534 93	2868 2950 97	3767 4012 94
District Total		A P %	10185 12327 83	13659 16269 84	18491 22678 82

A stands for Achievements.
P stands for Plan.

Source: Lead Bank-Parbhani District, Annual Credit Plan 2007-08.

We observe form the above table that the actual credit target was achieved in a steady range of 82 to 84 per cent of the planned credit. This means that there is a lack of improvement in achieving credit targets by all the financial institutions taken as a whole. The achievement was significantly deficient of the planned credit target in the Parbhani District for all the there reference years (2004-05, 2005-06, 2006-07).

- **The Agricultural Sector in Parbhani:**

i) Agricultural Crop Loan:

Credit extended by financial institution in Parbhani district to the agricultural sector in the form of crop loan shows a comparatively satisfactory situation, as the actual credit given to proposed credit has increased from 82% in 2004-05 to 93% in 2006-07.

ii) Agricultural Term Loan: The situation regarding agricultural term loans shows an alarmingly undesired tendency as the actual credit extended to agriculture in Parbhani in the form of term loan went down as a percentage of credit target to 28% in 2006-07 as against 72% in 2004-05 & 96% in 2005-06.

B) The Industrial Sector

Under the head "industries", the achievement of target is extremely unsatisfactory as we observe a continuously declining trend in 2005-06 & a very sharp reduction in achievement of target in 2006-07. This percentage (achievement as per cent of target) has sharply gone down from 69% in 2004-05 to 22% in 2006-07 which is indicative of the dismal position of the industrial sector in Parbhani in recent years.

C) The Services Sector:

In services sector also, there is deficiency in achievement of target, though the situation with regard to achievement of targets in comparatively better than the other two sectors. In 2009-10, 93% of the target was achieved. Whereas in 2010-11 and 2011-12, 97% and 94% achievement of credit target was achieved respectively. This brings us to the conclusion that excepting the trade sector, credit achievements in agriculture & industry are far from satisfactory.

Table 5.25
Recovery Position: All Banks (Rs. in Lakhs)

Sr.No.	Year		Agricultural	Industries	Services	Total
1	30-06-2009	D C %	NA	NA	NA	NA
2	30-06-2010	D C %	37052 21786 58.80	1765 1265 71.67	5062 3561 70.35	43879 26612 60.65
3	30-06-2011	D C %	40966 14179 34.61	846 465 54.95	2865 1760 61.43	44677 16404 36.72

D stands for demand
C stands for recovery

Source: Lead Bank Report Parbhani 2007-08 Prepared from various tables.

The overall recovery position of all banks together was 60.65% in 2010. It went down significantly to 36.72% in 2006. The recovery position in agriculture has remained relatively poor both in 2010 and 2011. It was 58.8% in 2010 & 34.61% in 2011. With regard to industrial sector, the recovery position was better in 2010 and it deteriorated in 2011 with low level of recovery (54.95). In services sector recovery was better (70.35% in 2010 which went down to 61.43% in 2011.

MEASURES TO IMPROVE RECOVERY POSITION:

The reasons for low recovery are as follow:

a) Willful defaulters
b) Mis - utilization/diversion of funds
c) Failure of crops due to natural calamities.

The Banks have adopted various strategies to improve the recovery position in the district:

Table no. 5.26 :
Details of Credit Institutions in the District.

Sr No.	Name of Taluka	Commercial Banks	No. of Institutions		PACS	Others	Total
			RRBs	Co-Operative			
1	Parbhani	17	9	13	85	1	125
2	Puma	2	5	10	65	0	82
3	Palam	1	1	6	43	0	51
4	Gangakhed	3	9	4	45	0	61
5	Sonpeth	1	1	4	23	0	29
6	Se!u	5	1	6	48	1	61
7	Pathri	3	2	5	31	1	42
8	Manvat	1	3	6	38	0	48
9	Jintur	3	0	11	80	0	94
	Total	**36**	**31**	**65**	**458**	**3**	**593**
		6.0%	5.2%	10.9%	77.2%	0.7%	100.0

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TABLE 5.27
crop loan disbursement in district

Crop Loan disbursement in District (short term credit)

Sr. No.	Taluka	Loan disburse in 2006-07						Total
		Co-Op.Bank		Commercial Banks		RRBs		
		No. of Loanles	Amount	No. of LoanLoanies	Amount	No. of LoanLoanie	Amount	
1	Parbhani		513.67		1179.1		94.04	1786.76
2	Purna		300.67		323.15		350.58	974.4
3	Palam		151.18		54.1		55.03	260.31
4	Gangakhed		492.33		376.78		210.25	1079.36
5	Sonpeth		298.71		124.43		68.03	491.17
6	Selu		239.44		579.34		119.8	938.58
7	Pathri		211.62		423.37		16.38	651.37
8	Manvat		191.07		8.03		102.03	301.13
9	Jintur		222.8		297.3		320.3	840.4
	Total		**2621.4**		**3365.6**		**1336.4**	**7323.48**

(35.8 %)

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SPREAD OF BANKING SERVICES IN PARBHANI DISTRICT:

Supply of adequate and timely credit to cultivators in a given region / district plays a crucial role in development of agriculture sector. Short, medium and large term loans at reasonable rates of interest is the need of the cultivators.

There are three type of banking institutions operating in Parbhani District. Table-37 indicates this information. There are 36 or (6.0%) branches of commercial banks; 5.2% (or 31) branches of Regional Rural Banks (RRBs); 10.9% (65) branches of cooperative banks, and, 458 (or 77.2%) are Primary Agriculture Credit Societies at the village level.

There are a total no. of 9 talukas / blocks in Parbhani District. of the total no. of 593 banks offices maximum 125 (or 21%) are located in Parbhani taluka; while the minimum 29 bank branches (or 4.8%) are located in Sonapeth taluka. All the talukas of the district have adequate banking services.

CROP LOAN DISBURSEMENT IN PARBHANI DISTRICT (2006-07):

Table no. 29 shows the data relating to the crop loan disbursement by cooperative banks, (Rs. 2621.4 Lakhs); Rs. 3365.6 Lakhs by commercial banks, and, Rs. 1336.4 Lakhs by Regional Rural banks, during the year 2006-07.

Of the total crop loan (Rs. 7323.48 Lakhs), the proportion of crop loan disbursed was 35.8% by cooperative banks; 45.9% by commercial banks and 18.3% was disbursed by Regional Rural Bank.

All the 9 talukas of the district have been supplied crop loans to the cultivators, during 2006-07. The maximum crop loan (Rs. 1786.76 Lakhs or 24.4%) was disbursed in Parbhani block alone; while the minimum crop loan (301.13 Lakhs or 4.1%) was disbursed in Manwat taluka. Gangakhed block also received Rs.1079.36 Lakhs or 14.7% of total crop loans. All the talukas of the district could obtain crop loans in varying degrees.

The table does not show the data relating to the number of cultivators receiving crop loans in different talukas of the district.

PROJECTED CROP LOANS REQUIREMENT DURING XI PLAN PERIOD IN PARBHANI DISTRICT (2011-12TO 2015-16):

Table 5.32 shows the projected crop loan requirement of Parbhani District during the XI Plan period. These estimates are made on the following assumptions:

1. A total no. of 29 crops, both Kharif and Rabi seasons have been covered.
2. Area under various crops, for the XI Plan period has been ascertained.
3. Scale of finance for each crop has been obtained as recommended by the District Level Technical committee (DLTC) of Parbhani District.
4. By multiplying area under each crop by the scale of finance per hectare, we have obtained the crop loan requirement of each crop for the XI Plan period.
5. The total area under 29 crops each year is shown in the table. It varies from 806300 ha in 2004-07, to 838300 ha. in 2011-12.
6. The total crop loan requirement is as follows:

I.	2011-12	Rs. 47220.00	Lakhs or Rs. 472.2 crore.
II.	2012-13	Rs. 48901.00	Lakhs or Rs. 489.01 crore.
III.	2013-14	Rs. 49493.00	Lakhs or Rs. 494.93 crore.
IV.	2014-15	Rs. 49505	Lakhs or Rs. 495.05 crore.
V.	2015-16	Rs. 49780	Lakhs or Rs. 497.80 crore.
VI.	2016-17	Rs. 51150	Lakhs or Rs. 511.50 crore.

GROUND REALITY:

The actual crop loan requirement is likely to be lower than what has been projected above, due to following factors.

a. In actual practice all the farmers in the district especially, the small and marginal farmers, do not have access to institutional credit, due to various reasons. In other words the coverage of the farmers by the banks is not 100%.
b. Many of the farmers, although, they may be members of the banks or PACs, they may not be eligible to obtain fresh loans, (willful and non-willful defaulters).
c. The banks / cooperatives may not have sufficient resources to supply adequate and timely crop loans.

Therefore, due to all these factors, the actual crop loan supplied by the banking system is likely to be 60% of the crop loans estimated above. This is also shown in the table, the actual crop loans issued may be as follows:

I.	2011-12	Rs. 28332	Lakhs or Rs. 283.32 crore.
II.	2012-13	Rs. 29341	Lakhs or Rs. 293.41 crore.
III	2013-14	Rs. 29696	Lakhs or Rs. 296.96 crore.
IV	2014-15	Rs. 29703	Lakhs or Rs. 297.03 crore.
V	2015-16	Rs. 29868	Lakhs or Rs. 298.68 crore.
VI	2016-17	Rs. 30690	Lakhs or Rs. 306.90 crore.

SHARE OF COOPERATIVE CREDIT:

District central cooperative bank, Parbhani, distributes crop loans through its Primary agriculture societies to the cultivators. It share in total crop loans issued by all banks together is about 40%. Hence, we have estimated the share of cooperatives at 40% of the total disbursement of crop loans. The share of coop. is as follows:

I	2011-12	Rs. 11333.00	Lakhs or Rs. 113.33 crore.
II	2012-13	Rs. 11736.00	Lakhs or Rs. 117.36 crore.
III	2013-14	Rs. 11878.00	Lakhs or Rs. 118.78 crore.
IV	2014-15	Rs. 11881.00	Lakhs or Rs. 118.81 crore.
V	2015-16	Rs. 11947.00	Lakhs or Rs. 119.47 crore.
VI	2016-17	Rs. 12276.00	Lakhs or Rs. 122.76 crore.

Table no. 5.28

Projected Crop Loan Requirement during XI plan, Parbhani District

Sr.No.	Crop	Normal Area 2009 -10to 2010-11		2012-13	2013-14	2014-15	2015-16	2016-17
1	Paddy	Area	60	60	60	60	55	50
		Rs.	(300.00)	(300.00)	(300.00)	(300.00)	(275.00)	(250.00)
2	Jowar	Area	825	834	800	800	800	750
		Rs.	(4125.00)	(4170.00)	(4000.00)	(4000.00)	(4000.00)	(3750.00)
3	Bajra	Area	85	67	50	50	50	50
		Rs.	(425)	(335.00)	(250.00)	(250.00)	(250.00)	(250.00)
4	Maize	Area	42	24	24	24	24	24
		Rs.	(210.00)	(120.00)	(120.00)	(120.00)	(120.00)	(120.00)
5	Other's	Area	2	2	2	2	2	2
		Rs.	(10.00)	10.00)	(10.00)	(10.00)	(10.00)	(10.00)
6	Tur	Area	528	638	650	650	655	700
		Rs.	(3960.00)	(4785.00)	(4875.00)	(4875.00)	(4912.5)	(5250.00)
7	Mung	Area	445	760	770	770	770	780
		Rs.	(3337.5)	(5700.00)	(5775.00)	(5775.00)	(5775.00)	(3850.00)
8	Udid	Area	151	175	180	180	180	200
		Rs.	(1132.5.00)	(1312.50)	(1350.00)	(1350.00)	(1350.00)	(1500.00)
9	Others	Area	11	13	13	13	13	10
		Rs.	(55.00)	(65.00)	(65.00)	(65.00)	(65.00)	(50.00)
10	Til	Rs.	43	40	40	45	45	45
		Area	(215.00)	(200.00)	(200.00)	(225.00)	(225.00)	(225.00)
11	Ground nut	Area	2	1	1	1	1	1
		Rs.	(15.00)	(7.5)	(7.5)	(7.5)	(7.5)	(7.5)
12	Sunflower	Area	71	72	60	60	50	50
		Rs.	(532.5)	(540.00)	(450.00)	(450.00)	(375.00)	(375.00)
13	Soyabean	Area	660	761	812	812	822	900
		Rs.	(6600.00)	(7611.1)	(8120.00)	(8120.00)	(8220.00)	(9000.00)
14	Other oilseeds	Area	22	62	62	62	62	62
		Rs.	(110.00)	(310.00)	(310.00)	(310.00)	(310.00)	(310.00)
15	Niger	Area	23	8	8	7	7	7
		Rs.	(115.00)	(40.00)	(40.00)	(35.00)	(35.00)	(35.00)
16	Sugar Cane	Area	130	130	126	126	126	126
		Rs.	(650.00)	(650.00)	(630.00)	(630.00)	(630.00)	(630.00)
17	Cotton	Area	1795	1513	1627	1627	1627	1532
		Rs.	(8975.00)	(7565.00)	(8135.00)	(8135.00)	(8135.00)	(7660.00)
18	Rabi Jowar	Area	1709	1538	1538	1538	1538	1538
		Rs.	(8545.00)	(7690.00)	(7690.00)	(7690.00)	(7690.00)	(7690.00)
19	Wheat	Area	464	450	450	450	500	500
		Rs.	(2320.00)	(2250.00)	(2250.00)	(2250.00)	(2500.00)	(2500.00)
20	Rabi Maize	Area	5	5	5	5	6	6
		Rs.	(25.00)	(25.00)	(25.00)	(25.00)	(30.00)	(30.00)
21	Other's	Area	3	3	2	2	2	3
		Rs.	(15.00)	(15.00)	(10.00)	(10.00)	(10.00)	(15.00)
22	Gram	Area	440	550	550	600	650	700
		Rs.	(2200.00)	(2750.00)	(2750.00)	(3000.00)	(3250.00)	(3500.00)
23	Other Pulses	Area	20	5	5	10	10	15
		Rs.	(100.00)	(25.00)	(25.00)	(50.00)	(50.00)	(75.00)
24	Safflower	Area	335	208	208	154	105	210
		Rs.	(1675.00)	(1040.00)	(1040.00)	(770.00)	(525.00)	(1050.00)
25	Linseed	Area	12	8	8	8	8	8
		Rs.	(60.00)	(40.00)	(40.00)	(40.00)	(40.00)	(40.00)
26	Sunflower	Area	114	55	55	55	55	55
		Rs.	(855.00)	(412.5)	(412.5)	(412.5)	(412.5)	(412.5)
27	Other Oilseed	Area	7	2	2	2	2	2
		Rs.	(35.00)	(10.00)	(10.00)	(10.00)	(10.00)	(10.00)
28	Ground Nut	Area	60	90	58	56	53	51
		Rs.	(600.00)	(900.00)	(580.00)	(560.00	(530.00)	(510.00)
29	Sunflower	Area	3	3	3	4	5	6
		Rs.	(22.5)	(22.5)	(22.5)	(30.00)	(37.5)	(45.00)
(i)	**Total A**		**8063**	**8077**	**8169**	**8173**	**8223**	**8383**
(ii)	**Total Rs.**		**(47220.00)**	**(48901.00)**	**(49493.00)**	**(49505.00)**	**(49780.00)**	**(51150.00)**
(iii)	**60% of (ii)**		**(28332.00)**	**(29341.00)**	**(29696.00)**	**(29703.00)**	**(29868.00)**	**(30690.00)**
(iv)	**Crop credit 40% of (iii)**		**(11333.00)**	**(11736.00)**	**(11878.00)**	**(11881.00)**	**(11947.00)**	**(12276.00)**

KISAN CREDIT CARD (KCC) SCHEME :

The KCC Scheme has been introduced in Parbhani district with a view to make credit flow more flexible way of handling crop loans portfolio by banks. It ensures drawls and repayments much flexible for the borrowers as well. The details of the KCC issued in Parbhani district upto 31st March 2007 are shown below:

Sr. no.	Bank	No. of Cards Issued	Amount (Rs. In lakhs)
1	Commercial Banks	39019	7991.86
2	Marathwada Gramin Bank	13134	2309.91
3	Parbhani DCC Bank	248802	1.0767.92

Source: PLP 2008-09 Parbhani District.

It is obvious from the table that the District Central Coop. Bank, Parbhani has a major share in issue of KCC cards in Parbhani Relatively, the share of comm. banks and Marathwada Gramin banks is very low and needs to be improved.

NATIONAL AGRICULTURE INSURANCE SCHEME:

The Govt. of India has introduced this scheme to provide financial compensation for less of crops on account of natural calamities. Crop insurance is a useful scheme to protect the farmers from the vagaries of nature. For Kharif 2007, the State Govt., had notified the scheme. But, due to the following factors the scheme is not working smoothly.

Although, the scheme is in operation in the district since the last 5 years, it is not yet stabilized due to lack of publicization. There is need to simply & nationalized the scheme.

The insurance premium under RKRY particularly for cash crops like cotton sugarcane is very high for loanee farmers, which is compulsory for them. Farmers feel that the rates of premium are any high and discouraging.

5.13 SPECIAL ONGOING PROJECT

ANIMAL HUSBANDRY / DAIRYING:

I Venture Capital Fund
II Marathwada Vikas Package Yojana
III Swarnjayanti Swarojgar Yojana
IV Other Tribal Scheme
V Scheme for Special Component.

SHEEP AND GOATS:

I Training of Farmers / Labourers

POULTRY:

I. Training of Farmers / Labourers / Women members from SGH'S

5-14 CONSTRAINT ANALYSIS

(A) PRODUCTIVITY GAPS - REASONS THERE OF ANIMAL HUSBANDRY/DAIRYING

COWS / BUFFALOES — BREEDING:

Artificial Insemination Technique is reaching to 35 percent of breedable cows / Buffalo population in Parbhani district. Constraints are as under:

I. Technical man power is inadequate.
II. Mobility of the staff is restricted for want of vehicles and / or conveyance allowance.
III. Shortage of electricity supply (Load Shedding). Even LPG(gas) or kerosin oil is not supplied to the Veterinary instituted This is hampering the important step of throwing of frozen semen straw and also sterilization of instrument/etc.

MILK PRODUCTION:

Milk production of Parbhani district is 2.8 Lakh Litres, which accounts for 4.1 percent of states total milk production. When compared to the leading district like Ahmednagar (18 Lakh Litres), Parbhani district is Lagging very much and there is huge gap between these two district milk production. Reasons are as under:-

I. Number of milch cross bred cows and buffaloes is very much less (14571 and 35525) than (2,70,000 and 1,16,000) in Ahmednagar district
II. Infra-structure facilities for collection, storage, processing and packing etc, milk are inadequate.
III. Majority of the milk coop, societies in the district are defunct.
IV. There is shortage of feed and fodder etc.

MEAT PRODUCTION:

Meat production of Parbhani district 1560 M.T. which accounts for 4.1 percent of states total meat production. Main reason for this is that majority of sheep / Goats in the
district area of local (Deshi) type having slow growth rate (body weight gain) and hence lower meat production. These is also shortage of grazing land, feed and fodder etc.

EGG PRODUCTION:

Egg production of Parbhani district is 132 Lakh which accounts for 0.4 percent of states total egg production. Reasons for such a gap are:

I. Majority of the poultry birds in the district are of local (Deshi) type, which are laying very few (60) eggs in a year.
II. Scientific breeding, feeding and rearing practices are not followed.
III. Shortage of feed etc. Required strategies to bridge-up the gaps in milk, meat, wool, eggs and broiler (poultry meat) production are suggested in respective section of the CADP- Project Report.

5.14-(C) – processing/Storage/Marketing gaps

In Parbhani district infra-structure facilities for processing, Storage and marketing of milk are inadequate. Milk collection vans, bulk collection vans, bulk coolers, farm coolers etc. are also required. Milk processing units need strengthening. Dairy Development Department is not arranging packing of milk in smeller size pouches as per the demand of the costumers and hence private

agencies are harvesting benefit of the situation. Slaughter houses- particularly for small animals are not established. Strategies for all are suggested in the Report.

INTERVENTIONS NOW RECOMMENDED FOR THE DISTRICT WITH DETAIL COSTING

Table 5.29
Gross value added from different categories and growth rates

(Rs. In Lakhs)

Sr. No.	Crop Categories	2009-10 to 2011-12	2016-17	Growth Rates (%/year)
1	Cercals	21723	26871	4.35
2	Pulses	10426	14779	7.23
3	Oilseeds	9359	11619	4.42
4	Cotton	5655	8032	7.27
5	Sugarcane	75506	109615	7.74
	Total	**122669**	**170916**	**6.86**

Table 5.30 :
Gross value added of Horticulture crops in Parbhani district

(Rs in lakhs)

Sr. No.	Crops	2006-07	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
1.	Fruit crops	13136.625	17226.985	21229.75	26380.85	31154.225	36867.25
2.	Vegetable crops	1660.75	2070.77	2597.3	3325.41	4188.45	5151.15
3.	Spice crops	1349.02	1733.475	2190.125	2639.806	2960.4	3357.705
4.	Flower crops	64.468	115.995	188.95	283.415	403.77	510.45
	Total	**16210.863**	**21147.225**	**26206.125**	**32629.481**	**38706.845**	**45886.555**

Table 5.31 :
Compound growth rate.

(Rs in lakhs)

Sr. No.	Crops	2009-10 to 2011-12	2016-2017	Compound growth rate
1.	Fruit crops	13136.625	36867.25	22.9
2.	Vegetable crops	1660.75	5151.15	25.4
3.	Spice crops	1349.02	3357.705	20.0
4.	Flower crops	64.468	510.45	51.2
	Total	**16210.863**	**45886.555**	**23.1**

5.16 PROJECTED OUTCOMES AND GROWTH RATES DURING XT FYP.
EXPECTED OUTCOMES AS A RESULT OF IMPLEMENTATION OF THE PLAN:

This comprehensive district Agriculture plan C-DAP, has been prepared under the guidelines of the RKVY. It deals with all these issues comprehensively. It attempts to provide solutions to overcome several impediments which are presently obstructing the development process. It presents scores of actionable projects, schemes, and programmes which, if implemented properly will help the district to shed out its agricultural backwardness and to take off on a fast growth track of much higher than 4% per annum growth of agricultural production.

As a result of implementation of the CDAP all sectors are expected to have a substantial addition to the gross production in the district.

TABLE – 5.32
GROSS VALUE ADDED IN VARIOUS SECTORS PARBHANI DISTRICT 2012-2017

Sr. no.	Sector	3 years average gross value 209-10 to 2011-12 in lakh	Gross value 2016-17 in lakhs	Compound annual growth rate %
1	Agriculture	122669.00	170916.00	6.86
2	Horticulture	16210.86	45886.55	23.10
3	Animal Husbandry	2344.00	3170.00	6.22
4	Sericulture	15.03	27.00	12.42
5	Fisheries	16440.00	20340.00	4.35
Total		157678.89	240339.55	8.79

Highest growth is in the horticulture sector both because of expansion of areas and increase in productivities. Significant increases in production and productivities will, however, accrue in the next four years when, very large plan investments in watershed development and minor irrigation start bearing fruit.

The proposals of C-DAP will provide employment to thousands of unemployed or partly employed people, raise standards of living in rural areas, reduce poverty and distress, and specially reach the benefits of growth and development to the thousands of small and marginal farmers who are mostly in distress today because of the non-viability of their farms and several other consequential handicaps. Naturally, this last group of small and marginal farmers and their handicaps are the focus of attention of many C-DAP proposals.

Earnest implementation of all C-DAP projects, schemes and programmes will result in simultaneous increments in productivity of each crop and each of the allied activities, in each farm in each village, and in each block in the district. Combined with improvements in credit, marketing employment and other infrastructure, the overall growth is bound to have a multiplier effect. It should be

certainly possible to raise farm production and farmer incomes at least by 50% over a medium term of five years. That should mean the beginning of the Second Green Revolution. The momentum generated, the self confidence gained by the farmers in the process and the continuing upgrading of agro- technologies will continue to lift the district economy to higher and higher levels in future. Outcomes of all the efforts will remain in the farmer's hands. No one else will claim any share or tax from them. Even the access to credit will be much easier and cheaper than what it has been during the past several decades. Accomplishment of this C-DAP will thus lead to the most desired well-being of the people of the district.

OUTLAYS AND OUT COME

Total outlay (Rs. lakh)	=	Rs. 24720.77
Stream I	=	Rs. **12449.37**
Stream II	=	Rs. 12271.40
Per capita outlay/ during XI plan	=	Rs. 19808

OUTCOME
Gross Value Added (GVA) Constant Prices

	GVA of		(Rs. lakhs)
1)	Average of 3 years 2009-10 to 2011-12	=	Rs. 157678.89
2)	GVA of final year 2016 – 17	=	Rs. 240339.55
3)	Compound Growth Rate	=	8.79 %
4)	Improvements in Gross value per from	=	Rs. 45310
	Cultivator to	=	Rs. 69063
5)	Improvement in GVA per annum per capita (rural population)	=	Rs. 12735 to 19258

CHAPTER VI
DISTRICT PLAN – PARBHANI

6.1 INTRODUCTION: We are presenting in this chapter a detailed District Plan of Parbhani, for the XI plan (2007-12). It includes important growth drivers, innovative schemes, and budgetary provisions for the XI plan, to achieve the targeted growth rate. This also contains the necessary requirement of inputs such as improved seeds, fertilizers, pest-control measures. Projects are also included on improved water management, specifically, use of drip/sprinkler irrigation. Watershed management & soil health. Training and technology transfer facilitating farmers knowledge, have been projected. Some of the innovative schemes have been suggested.

6.2 SECTORAL / REGIONAL GROWTH DRIVERS OF THE DISTRICTS: Out of the several proposals made in the C DAP, we are highlighting a few below, which, in our opinion, set the direction of development and on which the success of the C -DAP depends.

(i) The massive program of watershed development combined with the expansion of soil testing facilities and supported by inputs for soil health enhancement is the key driving force for the sustained growth and long term development of agriculture in the district. All the small and marginal holdings which are degraded for want of inputs and will be covered by these two very positive aspects of soil conservation and soil health enhancement. Combined with other inputs and improvements, one third of all the cultivated area which has not been making any positive contribution to production will come back in the production stream.

(ii) Diligent water Resources Management : The huge watershed development programme proposed in the C DAP will augment ground water availability substantially. Its diligent use through old and new wells fitted with micro irrigation systems will double the irrigated areas, enable growing of high value crops including horticulture and raise their productivities. Thousands of farm ponds will provide irrigation for at least one more crop and improve the viability of presently nonviable farms. Better maintenance and management of the canal systems of the existing projects will add large areas under irrigation.

(iii) Empowerment of Asset less Poor farmers
The proposed empowerment will,

i) Help rejuvenation of agriculture in the village through the good services provided by the SHG/S;

ii) Help rejuvenate their own presently non-viable farms through their own good services and input;

iii) Lift more than 60% of the total farmer families from their BPL marginal living to a self employed, wage earning and dignified status of well being.

The proposed empowerment will make a quiet but, fully constructive socio-economic revolution. **iv)** Improving productivities of all the crops through better practices and inputs will be another driving force for growth. Raising the areas under higher value crops will raise incomes of the farmers. There should be an all-round effort to fill in all productivity gaps. **v)** Effective extension and intensive training of farmers are two key elements of CDAP. The whole process of dissemination of modern technology and acceleration of growth of agricultural production depends on how we conduct these two drivers i.e. direction setting activities. **vi)** Peoples participation:

The C DAP will be directly approved by the DPC or DPDC. Several of the elements like training, organizing, or monitoring are the responsibility of people's representative bodies like, Panchayat Samities or GPs or NGO/s like ATMA, KVK etc.

Agriculture itself and several supporting activities are in the private sector. This should mean that the process will not be much burdened by official inertia or indifference. The reward being their own district's development and well being of the people, we do hope that everyone concerned would do his best and make the CDAP a success.

I) INNOVATIVE SCHEME : (A) ORGANISING ASSET POOR FARMERS INTO SHGS:

A major weakness is the skewed land holding or land ownership in the district and operating holdings of less than 2 ha together holding 30% of cultivated area. Most of these small holdings are meaning that they consist of more than one piece of land scattered or located away each other. Those holdings are un-economic and non-viable. The owners do not afford to keep even a pair of bullocks. Their cultivation is indifferent. The lands receive desired village rarely and do not at all get any manures or fertilizers for soil health, As a result their soils have gone on degrading and their productivities are very low. Thus, 30% of the cultivated area is not contributing in the process of agricultural growth and 60% of the ' holders are living a low level of bare existence.

We have proposed an innovative scheme (see section 5.Sin chapter 5) to organize these asset poor and asset less farmers in Self Help Groups and to train and help them undertake agro-services and small agro- producing enterprises which are critical for rejuvenating the whole system of agriculture of the village. In the process the members of these SHGs will also be enabled to bring their own holdings back to viability and with additional employment and earnings get out of the poverty trap.

6.3 INNOVATIVE SCHEME : ADOPTION OF NEW TECHNOLOGY:

i) Fluctuations in market prices of agricultural produce is the major cause of fluctuations in the levels of incomes of the farmers. As long as the market prices of agriculture produce are higher than the Minimum support Prices (MSP) declared by the Govt; there is no problem of pricing. But if the market prices collapse due to excessive production or other reasons, the farmers have to be helped through remunerative minimum viable support prices of the Govt.

The XI plan document prepared by the Maharashtra State Planning Board has stated that, " Prices of agricultural produce should be based on the cost production and the proportion of rural credit should be enhanced taking into account the actual cost of cultivation of the produce.

Table 6.1

Comparative Per Hectare Cost (A) and Gross Income by Crop Cutting Survey (CCS) and Through Adoption of Marathwada Agriculture University Technology.

Sr. no.	Crop	CCS Cost-A Rs.	MAU Tech. P/ha cost Rs.	Difference in cost Rs.	Yield P/ha CCA	Yield P/ha MAU	Diff. in yield P/ha Qnt.
1	Soyabean Cost P/Q	13568 1130	19507	5939	12.00 (16948)	30.0 (53300)	28.00 (250)
2	Kh. Gr.Nut Cost P/Q	13380 1543	17925	4545	8.67 (16565)	18.0 (41700)	9.33 (48)
3	Sunflower Cost P/Q	11146 1594	16303	5157	6.99 (13176)	20.0 (40400)	13.00 (286)
4	Sesamum Cost P/Q	6637 1880	12380	5743	3.53 (11363)	6.00 (18100)	2.47 (170)
5	Safflower Cost P/Q	10533 1581	12780	2247	6.66 (11819)	10.0 (20200)	3.54 (150)
6	Sugarcane Adsali Cost P/Q	46102 79	63815	17713	583.83 (51425)	1400 (119000)	816.17 (240)
7	Cotton Cost P/Q	34970	27294	-	10.99	-	-
8	Bajra Cost P/Q	10116 734	13700	3584	13.79 (11744)	35.00 (37500)	21.21 (254)
9	Maize Cost P/Q	10825 459	22975	12150	23.60 (19600)	50.0 (50500)	26.40 (212)
10	Wheat Cost P/Q	16578 948	27270	10692	17.49 (18735)	40.0 (46500)	22.51 (229)
11	Tur Cost P/Q	13181 1527	17245	4064	8.63 (17930)	15.0 (33800)	6.37 (174)
12	Rabi Jowar Cost P/Q	9708 1048	14900	5192	9.26 (12245)	25.0 (31000)	15.74 (270)
13	Mug Cost P/Q	8227 1840	14015	5927	4.47 (12736)	12.0 (25680)	7.53 (268)
14	Udid Cost P/Q	8288 1720	14215	6555	4.82 (15715)	12.0 (24480)	7.18 (249)
15	Gram Cost P/Q	11425 1766	17980	-	6.77 (13913)	25.0 (55300)	18.23 (369)
16	Kh. Jowar Cost P/Q	10417 687	16120	-	15.16 (12227)	50.0 (47000)	34.84 (330)

Figures in bracket are gross return per hectare.

Adoption of New Technology and Raising Productivity of Crops: To make the cultivation of crops remunerative in a backward region like Marathwada, adoption of new technology by the farming community is the only solution. For adoption of new technology however enhanced amount of investment (credit) has to be supplied by the banking sector (see table 6.1)

Table 6.1 shows the cost – A per hectare by adopting existing practices, while col.2, shows cost of cultivation per hectare if Marathwada Agriculture University Technology is adopted by the farmers. The productivity, per hectare increase between 150% to 330 % in various crops. But it also requires addition investment as shown in the table 6.1

Hence, it is suggested that to make farming profitable in a backward area like Parbhani and other districts, adoption of new technology on mass scale is the solution to get through vicious circle of low productivity and low level of incomes.

I) FINANCING THE NEW TECHNOLOGY:

For meeting the additional cost of cultivation due to adoption of new technology by the cultivators, Financial Inclusion Technology Fund has been created with a corpus of Rs. 500 crore, with initial contribution by Central Govt ; RBI; and NABARD. The State Govt. may take advantage of this fund, to enhance the productivity of crops in agriculturally backward district in the State. (see PLP2008-09 Beed District, NABARD, P117)

II) The Study Group on Farmers' Indebtedness, appointed by the Govt. of India (July 2007) (Radhakrishna Committee) has identified" 100 agriculturally less developed and distressed districts" in the country of which 11 districts are from Maharashtra State (Osmanabad and Nanded from Marathwada). The Committee has recommend an amount of Rs. 10000 crore for agricultural development of these districts. If this recommendation is accepted by the Central Govt.; the State Govt. may receive some funds for these less developed districts.

6.4 VISION OF XI PLAN

Our vision of the distract is that in the next ten years

i) It should be doubling its production from agriculture and allied activities;
ii) it should have — —
   a) Modern physical infrastructure;
   b) Modern social and institutional infrastructure;
   c) Healthy and sustainable environment; and
   d) Full employment; and
iii) It should be free of _
   a) Poverty;
   b) Illiteracy and ignorance;
   c) Social disparities; and
   d) Gender disparities,

For actualizing this vision, the C- DAP attempts to explore possible ways of better utilization of natural, physical and human resources. It attempts to discover

and locate latent potentials of growth and development and is making proposals for activating human energies and social organizations for their full utilization.

C -DAP proposals for reforms and strengthening of the extension agencies should help inform the farmers of the latest technologies and adequately motivate them to diligently work for their own advancement.

The reforms and strengthening of the implementation agencies in the district are of crucial importance. The best policies and programmes fail because of poor governance and shortcomings in implementation. An innovative re-orgainsation to provide missing coordination links within the different wings and departments involved with implementation is absolutely necessarily is also imperative to set up reasonable working relationships with Pnchayat Raj Bodies, NGO's and Public Private Partnerships,. If the government is serious about transformation of rural economy and rural society through massive programmes like RKVY it must take early steps to provide for a strong inspired implementing agency to lead that 411 movement in the district and to get results.

This C-DAP has recommended several strategies for various sub-sectors to overcome the reasons of backwardness and to accomplish the vision stated in para 2.3.1 above. Details like rationale behind them, action plans with physical targets, financial requirements and outcomes, and implementing schedules will be found in the related chapters. Action plans have been formulated so that their implementation will make a grate impact on the agricultural growth and development of the district. It is worthwhile to emphasize that every element of action plan under each strategy positively contributes to the desired results. Most elements will be simultaneously in operation and will have additive effects on outcomes of each other. That add-on effect would lead to still higher growth.

PROFILE OF A PROJECT

1)	Title	:	Agro based Rural Development
2)	Nature of activity (Programme)	:	Organising asset poor farmers in Self Help Groups and training them for critical agro services.
3)	Operational Area	:	All blocks in the district
4)	Operation target (units)	:	4000 SHGs
5)	Cost per unit	:	20,000
6)	Total cost of the project	:	800 lakhs
7)	Spread of the programme during 5 years – operational and costs	:	

Table 6.2

Sr. No.	Taluka/Year	1	2	3	4	5	Total
1	**Taluka - Parbhani**						
	Units	100	100	100	100	100	500
	Cost (lakh)	20	20	20	20	20	100
2	**Taluka – Purna**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
3	**Taluka – Palam**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
4	**Taluka – Gangakhed**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
5	**Taluka - Sonpeth**						
	Units	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
6	**Taluka – Selu**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
7	**Taluka - Pathri**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
8	**Taluka – Manvat**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
9	**Taluka - Jintur**						
	Unit	100	100	100	100	100	500
	Cost	20	20	20	20	20	100
	District Total						
	Unit	900	900	900	900	900	4500
	Cost	180	180	180	180	180	900

8) Executing Agency — District Rural Development Agency DRDA

9) Monitoring Agency — ATMA

10) Out comes — 100% of Asset poor and asset less farmers to be covered and empowered

11) Funding Proposals –

6.5 IMPROVED TECHNOLOGY DISSEMINATION CO-ORDINATION OF TEACHING, RESEARCH AND EXTENSION INSTITUTIONS

RATIONALE:

People's aspiration about agricultural development in the district is improving the economic viability of farming and enhancing the livelihood security. Increasing the net income of the fanner is only possible by enhancing the productivity, profitability and stability of overall agricultural production on sustained basis. The National Agriculture Policy 2000, National Farmers Commission 2006 and II^{th} five year plan approach paper 2007 targeted 4% growth in agriculture and allied sector. As more than 70% of the population derives its livelihood from agriculture and allied sectors and the solution to eradicate poverty lies in the development and growth of this important sector of economy, National Development Council (NDC) 2007, reaffirmed to achieve 4 per cent annual growth in agricultural sector during the 11th plan, NDC has directed the state Govts to formulate comprehensive District Agriculture Plan (C-DAP) for the holistic development of agriculture and allied sectors in the district to ensure that farming becomes more viable and economic conditions of farmers especially that of the small and marginal segment, is improved on a sustainable basis.

There is huge knowledge deficit in agriculture and allied sectors. Agricultural extension and support services system therefore, have to play a key role in effective dissemination and use of available improved agricultural technology. Infact, credible and quality extension services would be one of the major drivers for high and inclusive growth in agriculture and allied sector. The accepted frame work of Agricultural extension system at district level for technology delivery and dissemination is presented in Fig- 1. It consists of network of Institutions and groups which includes Zonal Agri. Res. Stations (ZARS)/ Sub-Res. Stations, K.VK, Line departments, private and non-Govt. (NG's orgamza"ons and farmers groups (FiGs., SHGs) and individuals. The district extension network must develop partnership, complementary" and synergy among them TO bring in the continuity of various supplies arid services and market on one side and technology development, delivery and dissemination on the other side. In this Basic District Level Interactive Extension Model (BDIEM), Agri. Technology Management Agency ATMA assumes utmost position in designing appropriate mechanisms and linkages basically required in the extension system at district, block and village level for technology transfer with functional process interventions.

In order to facilitate the effective functioning of ATMA, following action points are suggested.

SUGGESTED ACTION POINTS

- Organizational arrangement and operational modalities at district, block and village (field) level need to be properly strengthened to create integrated (single window) extension system.
- ATMA should strive hard for greater coordination among different players for effective implementation of extension Programmes,
- Orientation, sensitization and capacity building of extension functionaries of key line departments, public/private organizations and farmer's interest/self help groups need to be tailor-made for effective functioning of various arms of ATMA like AMC, FIAC, BTT, FAC etc.
- Members of village Panchayat, village level farmers groups, commodity groups, village level role model farmers be trained and involved in preparing block level extension plan and its implementation.
- Project-Director, ATMA be an independent senior officer of the rank of joint director of Agriculture to effectively lead and co-ordinate a multi-disciplinary team of senior officers from various key line departments as members of AMC,
- Office incharge (OIC) at block level to provide effective administrative supervision under the auspices of FIAC to be of the rank of Deputy Director of Agriculture.
- It is proposed to delink input supply arrangements, seed and soil testing etc from the primary responsibility of providing extension services.
- Public investment through ATMA need to enhance for training and capacity building of grass root level partners in public/private extension system.
- District and block level officials of key line department should regularly and judiciously participate in SAC of KVK and ZREAC of SAU for better interface.
- ATMA should strive hard in converging all the extension efforts and pooling all resources, infrastructure and expertise available at various institutions, in the district network to develop real time integrated farming system model of extension service delivery to bring breakthrough in development and growth of agriculture and allied sector.

KVK

As technology hub and light house of the district for farmers, KVK must act as link between technology generation system of the ZRS/SAU and extension system in the district.

- KVK must strive hard for continuous flow of knowledge, techniques and technologies of research institutes and SAU to various stakeholders in the district extension system and researchable feed backs from extension system to ZRS/SAU to minimize the time lag between generation of technology and its awareness and adoption.

- KVK must regularly participate in GB and AMC meetings of ATMA and monthly district workshops and ZREAC conducted by the ZRS/SAU.

- KVK must plan and implement their programmes as per the needs of district based on the SREP.

- KVK should facilitate capacity building of various extension functionaries of the district both public and private /NGOS through need based effective trainings.

- The context and methodology of trainings and the trainers and trainees must be periodically evaluated for suitable modifications to ensure effective training programmes.

- KVK should bestow their attention for developing and maintaining model demonstration farms /units, effective conduct of OFTs and FLD's by involving all line departments, NGO's etc for large scale dissemination and adoption of improved technologies.

- Being a specialized institution at the district level, the KVK has to serve as a **Light house** for farmers who look forward for something new, something novel and something innovative to add value to their agriculture in meeting aspirations.

ZRS/SAU

- District Extension Education centers with a team of subject matter specialists be established by the SAU with necessary infrastructure for specialized Training and capacity building of District Extension staff and farmers/change agents and diagnostic and farm advisory services.

- Mobile crop/soil health clinics be established for diagnostic team visits for on spoit solution to the problems of the farmers.

6.6 IMPLEMENTING CDAP :

I RAISING PRODUCTIVITY AND PRODUCTION :

The first key objective of CDAP is raising productivity and production of all crops and all other allied activities of every farmer by adopting modern farming technologies and best practices. Eight critical areas and objectives for accomplishing this objective are as follows:-

i) A network of block-wise soil testing laboratories with an upgraded district H.Q. laboratory along with setting up, through the SHGs of asset poor and asset less farmers, local agro-services for drawing soil samples, reaching these to the laboratories, getting scientific advice (cards) for the farmers and helping them in buying and putting the advised inputs for preservation or enrichment of their soils.
ii) Increasing use of modernized tools, implements and farm machines
iii) Increasing areas of high value crops including rainfed or irrigated horticulture.
iv) Adoption of best practices, modern technologies and inputs for raising productivity of all crops and allied activities motivated and supported by a caring and technologically competent extension agency.
v) Intensive effort on training of farmers and demonstrations preceded by equally intensive effort on training and technological up-gradation of trainers and all extension workers.
vi) Each farmer or each farm should have at least one dug well or a farm pond with micro irrigation system installed for optimally using his rainwater or ground water resources.
vii) Local sector has to develop new M.I. Schemes, do good repairs and maintenance of the existing M.I. Schemes and restore those in disrepair so that huge investments made in the past are brought back to gainful use.
viii) Ensuring adequate and timely suppliles of pure quality seeds, fertilizers, pesticides and other inputs.

The State Agriculture department and the Zilla Parishad have been traditionally engaged in all the activities described above though without outstanding results. They are, however, the most appropriate agencies to lift up all those activities to a higher pitch needed to accomplish the first key objective. Their extension wings need to be strengthened so that they carry out the mission more vigorously and get results.

II. SHGS OF ASSET POOR AND ASSETLESS FARMERS:

The second key objective is to promote self help groups (SHGs) of asset poor and assetless farmers and with training, and promotional and motivational support as well as financial back up to empower them to transform themselves as providers of critically useful agroservices to the village community and thus contribute to the rejuvenation of agriculture of the village including their own presently non-viable farms.

The DRDA has been promoting SHGs for some years now thought mostly of women. It has been set up to implement antipoverty schemes. DRDA is, therefore, the most appropriate agency for promoting SHGs of asset poor and assetless farmers, their training and initiation of several possible agro services and micro-enterprises

through those SHGs with the object of bringing those poor farmers out of poverty. DRDA has to do that promotional activity more vigorously and in a result oriented manner. DRDA has to be suitably strengthened for that purpose.

III. ASSOCIATION FOR PROGRESSIVE FARMING :

The third key objective is the promotion and formation of an Association For Progressive Farming (AFPF) separately for each block with village-wise branches and a district-wise federation. These associations will constitute the peoples' participatory compliment to the CDAP mission. It has a great potential of future development and should be supported and encouraged to gradually take over and run the CDAP mission as its own enterprise.

When the Association gets a clear sense of its purpose and the prospect of lifting up the agriculture economy of the district to higher and higher levels, the individual progressive farmers and other social workers will be willingly making important contributions. When they feel that they can improve the society in which they are living through their participation through the Association For Progressive Farming, they will certainly bring vigor and enthusiasm to their roles and get positive results. The AFPF, therefore has a tremendous potential of mobilizing people's energies for growth and development.

On the lines of public private partnership, the AFPF may, in future be taking up watershed development projects, composting projects for utilizing solid waste and sweepings of cities, towns and bigger villages, setting up soil testing laboratories and/ or operating them, organizing viable network of agro-processing units and endless number of other creative activities for supporting and caring for the farmers in general and the poor among them in particular.

The AFPF is not envisaged as a mass organization with thousands of members. At the block level it is envisaged as an NGO or voluntary organization with a band of about fifty active, committed and progressive farmers with orientation to science and social service.

At the village level about ten progressive farmers inclined to social causes would do. Their commitments to the CDAP cause will get firmed up through the work they do and the potential they would find.

The AFPF should be developed based on local perceptions of rural development and talents available. The promoters should, however, keep the successful models of Jazira of SUDAN, vicos of Peru, comila of Bangladesh and particularly the Joint Commission on Rural Reconstruction (JCRR) of Taiwan and their numerous present day successor NGOs working in India and all over the world.

The promotional work may have to be done mainly by the department of Agriculture and specially by the Senior Officers in the district. The Collector and ATMA should take initiatives, assemble well known Social Workers in the district and build up the blockwise associations to a working status in the first three months. Names better approved locally than AFPF may be allowed. A sort of competition should be encouraged for work and results among the various blockwise associations. Best work should be suitably recognized and rewarded by the government year after year.

The department of agriculture and/or ATMA may have to provide funds to the AFPFs for their initial steps until they build up their own resources through membership fees, donations or works. Institutional Membership of AFPFs should be open to large co-operative ventures, societies, market committee's, banks, NGOs/V.Os and local bodies.

IV STRENGTHENING OF THE EXISTING ORGANIZATION STRUCTURES:

In our opinion ATMA presently chaired by the Collector of the district should be designated as the Chief Authority for implementing the CDAP. It is necessary to provide adequate support to the Collector so that ATMA functions effectively. We propose;

1) A senior S.A.O. (full time) as Secretary and Executive Officer of ATMA;
2) A Senior B.D.O. (full time) to secure co-ordination with Panchayat Raj Institutions; promotional work of AFPFs
3) A publicity Officer to continuously work with the media for the CDAP mission and organizing educative programmes, conferences, workshops etc. preparing write up and publicity material
4) Customary staffing assistance to the above three officers. A block annual grant of 10 lakhs for promotional work/rewards etc.
5) A vehicle (like a jeep) for the officers touring in rural areas.

ZILLA PARISHAD:

1 - One Senior BDO to work as addl. Dy. CEO to build up vigorous activities at the Z.P. Panchayat Samiti and Gram Panchayat levels in support of C-DAP programmes and specially those of development of M.I. schemes and assured adequate and timely supplies of pure quality inputs like seeds, fertilizers, pesticides etc.

DRDA ;

i) Two Assistant Project Officers in the office of Project Director for the work of promoting SHGs of asset poor and assetless farmers and setting them to designed agro services and micro-agro enterprises.
ii) One additional APO for each block to assist the work of SHGs of poor farmers.
iii) Customary staffing assistance to the new APO/s.

PANCHAYAT SAMITIES:

Block level agricultural officer extensions should be of at least class II rank.

AGRICULTURE DEPARTMENT:

Strengthening of the department of Agriculture is inevitable. It is learnt that it already has a huge staff in the district. But restructuring to keep in tune with improving technologies, growing awareness among the farmers and developing Panchayat raj institutions is necessary. All agricultural production and activities to be promoted or motivated are is private sector. Extraordinary skills of communication are required to be effective in this situation. The farmers in general have, nowadays, exposure to both print and electronic media extension programmes for them need to

be redesigned now both for larger technological content and an inspiring motivational appeal.

In the meantime, the department itself seems to be deliberating upon restructuring proposals. Without any reference to those matters, we are proposing following measures of strengthening required for effective implementation of CDAP.

i) A new full time Senior SAO as Secretary and CEO of ATMA

ii) a) All Taluka level Agricultural officers should be in class I and designated as Deputy Directors. b) Each Dy. Director would also be working as ex-officio Secretary and Executive officer of the proposed Association for progressive farming. C) Each Deputy Director should be provided a jeep and a driver.

iii) Each Agricultural Polyclinic should have an Agriculture Officer in class II to be in charge. New polyclinics should be opened for new talukas which do not have them now. These clinics should grow as centers of all CDAP activities, Farmers meetings, training and demonstrations. They should be undertaking activities supporting the farmers like manufacture; storage and sale on a no profit no loss basis of composting, vermi culture, seeds, fertilizers, pesticides, tools etc.

Stream - I

Table No - Department Wise Infranstructur And Assets New Scheme Proposed

			(Rs. Lakh)			
No	Name of department	Scheme New / Ongoing	Year wise programme (Financial)			Total
			2014 - 15	2015 - 16	2016 - 17	
1	Agriculture	Seed Processing Unit.Rs.15 lakh per unit	0	45	45	90
2		Establishment of District Extension Education Center at Destric Head Quarter	0	40	40	80
3		Agriculutre mechanization	0	75	80	155
4		Processing of guava pulp	0	80	80	160
5		Broad Bed Furrow implement 100 per taluka	0	432	432	864
6		Processing of turmeric and other spices	0	40	45	85
7		Ripening chamber	0	50	70	120
8		Fram 30x30x3 m	0	300	300	600
9		Establishment of oil mill	0	100	100	200
10		Crop harvester (cottan, wheat)	0	250	290	540
11		Cold storage	0	100	120	220
12		Desilting of water bodies & maintenance of watershed works done by Agriculture Dept	0	150	200	350
13		Well recharging of farm wells	0	75	150	225
14		Mobile soil Testing Van	0	50	60	110
15		Soil helth Improvement Programe Through soil health card distribution	0	25	40	65
16		Adarsh sansad Gram Yojana		100	120	220
		Total	0	1912	2172	4084
17	Minor Irrigation	Renovation and modernization of major irrigation porjects	0	225	225	450
		Total	0	225	225	450
18	Animal Husbandary	Estabishment of gokul gram under Rashtriya gokul mission	0	500	500	1000
19		Eastabishment of mobile extension centers for publicity of govt. schemes of creation of awareness among farmers at distr. level	0	100	50	150
20		Mobile marketing units for poultry		100	100	200
21		Facilitating market linkage for live birds animals subsidy ceiling Rs.2.00 lakh /unit	0	100	100	200
22		Introduction of power driven chaff cutter	0	30	30	60

23		Modernization of veterinary despensaryies Gr. 1 for online data entry	0	20.85	20.85	41.7
		Total	0	850.85	800.85	1651.7
24	MAHARASHTRA ANIMAL AND FISHERY SCIENCE UNIVERSITY COLLAGE OF VETENARY AND ANIMALS SCIENCE	Extending technologies to rural poor through improvement of fertility and productivity of dairy animals	0	106.4	710	816.4
25		Strenthening and Modernizaton of Teaching Veterinary Clinical Complex Diagnostic laboratory and estabilshment of training centre at Collage of Veterinary & Animal Sciences, Parbhani	0	70.7	386.75	457.45
26		Modernization of Department of Vetaerinary Medicine, COVAS, Parbhani	0	399	0	399
27		Mobail Veterinary Diagnostic & Telemedicine center	0	973	0	973
28		Enhancing livelihood through Clinical Investigatory of Livestock at Parbhani	0	57.44	12.44	69.88
29		Establishment of experential learning cum training unit	0	82	49.5	131.5
30		Eastabishment of Necropsy Center	0	152	7	159
31		Eastabishment of poultry trining center for low input technology with improved poultry breed in parbhani district of maharashtra state	0	275	85	360
		Total	0	2115.54	1250.69	3366.23
32	Dairy. Development	Supply of khoa/ paneer making machine to milk Producer	0	25	30	55
		Total - II	0	25	30	55
33	Sericulture	Assistance for Chawki Rearing Centers	0	8	8	16
34		Assistance for Multiend Reeling unit	0	20	20	40
35		Assistance for irrigation facility	0	30	30	60
		Total -	0	58	58	116
36	Fisheries	Integrated fish Development Project through proper transport, Marketing facilities, Cold storage	0	90	90	180
		Total -	0	90	90	180
		Total -	0	5276.39	4626.54	9902.93

Stream - I

Table No - 31 Department Wise Production and Growth new schemes proposed

			(Rs. Lakh)			
No	Name of department	Scheme New / Ongoing	Year wise programme (Financial)			Total
			2014 - 15	2015 - 16	2016 - 17	
1	Agriculture	Special Exposure Visit at Rs 20 lakh per year/ district	0.00	20.00	20.00	40.00
2		Subcidy For Production of HYV Certified of Soybean.Mung,Tur,Udid	0.00	90.00	90.00	180.00
3		Eastabishment of HDPS Guava Plantataion	0.00	30.00	30.00	60.00
4		Increasing woman participation	0.00	5.00	8.00	13.00
5		Building Commodity groups and farmers organization	0.00	5.00	5.00	10.00
		Total	0.00	150.00	153.00	303.00
6	Animal Husbandary	A.I.D Delivery System Under RKVY	0.00	100.00	50.00	150.00
7		Clean milk Production Through Supply of milking machines to farmers on 25 % Subsidy	0.00	100.00	50.00	150.00
8		Assistance to farmers for promotion of integration livestock farming on 25 % subsidy		625.00	625.00	1250.00
9		Distribution of fodder seed	0.00	15.00	15.00	30.00
10		Estabishment of silase making unit	0.00	30.00	30.00	60.00
11		Fodder production from fallow land	0.00	30.00	30.00	60.00
12		Estabishment of Hydroponics fodder production unit	0.00	15.00	15.00	30.00
13		Estabishment of A.Azolla production unit	0.00	15.00	15.00	30.00
14		Distribution of 40 female and 2 male goat in DPAP Area	0.00	1.94	0.00	1.94
15		Estabishment of silage making unit in Drought affected districts under RKVY as drought mitigation measurment	0.00	31.50	0.00	31.50
16		Stall fed 40 + e goat unit by punyashlok ahilyabai Maharashtra mendhi vasheli vikas mahamandal	0.00	42.00	42.00	84.00
		Total	0.00	1005.44	872.00	1877.44
17	Dairy. Development	Supply of impooved milch animals under Marathwada Vikas Package Yojan Total	0.00 0.00	75.00 75.00	75.00 75.00	150.00 150.00
18	Sericulture	Mulberry Plantation (RKVY)	0.00	36.00	40.00	76.00
19		Catalytic Development Programme	0.00	30.00	35.00	65.00
20		Egg spawn and Mulberry Plantation	0.00	35.00	40.00	75.00
		Total -	0.00	101.00	115.00	216.00
		Grand Total -	0.00	1331.44	1215.00	2546.44

Stream - II

Table No - 30 Department Wise Infranstructur And Assets New Ongoing

		(Rs. Lakh)			
(Brosting schmes Stengthening)					
No	Scheme New / Ongoing	Year wise programme (Financial)			Total
		2012-13	2013-14	2014-15	
	Agriculture				
1	Communtiry Thanks (under RKVY)	0.00	20.00	150.00	170.00
2	Micro irrigation	192.26	300.00	595.98	1088.24
3	Accelerated Watershed Development Programme	222.00	250.00	300.00	772.00
4	Watershed Development Programme (under RIDF)	553.00	600.00	650.00	1803.00
5	Strenthening of Agri Polycleanic	7.55	0.00	3.00	10.55
6	Strenthening of Taluka Seedfarm	2.00	3.00	5.00	10.00
7	Strenthening of Biolab and Soil testinh lab	2.99	0.25	1.00	4.24
8	Agricultural Mechanization Scheme	0.00	0.00	63.62	63.62
	Total	979.80	1173.25	1768.60	3921.65
17	Animal Husbandry				
18	Strenthening of Vety. Clinics	20.00	25.00	30.00	75.00
	Total	20.00	25.00	30.00	75.00
	Dairy.Development				
25	Dairy.Development Erection of chilling plant	0.00	35.26	82.27	117.53
	Total	0.00	35.26	82.27	117.53
	Fishries				
27	Establishment of fish seed farms	18.00	20.00	20.00	58.00
	Total	18.00	20.00	20.00	58.00
	Social forestry	0.00	57.44	12.44	69.88
29	CCT	51.40	35.26	43.37	130.03
	Total	51.40	35.26	43.37	130.03
	Grand Total -	1069.20	1288.77	1944.24	4302.21

Stream - II

Table No - 30 Department Wise Production and Growth Ongoing schemes

		(Rs. Lakh)			
(Existing schmes Stengthening)					
No	Scheme New / Ongoing	Year wise programme (Financial)			Total
		2012-13	2013-14	2014-15	
	Agriculture				
1	National Food Security Mission (pules Crops)	510.81	631.00	1191.00	2332.81
2	Coares Grain Development (under RKVY)	320.00	91.51	95.00	506.51
3	Accelerated Fodder Development Programme (under RKVY)	112.00	60.00	227.00	399.00
4	Hybrid Tur Programme (under RKVY)	0.00	0.00	5.00	5.00
5	Cottan Development Programme (under RKVY)	23.32	28.65	62.00	113.97
6	Sugarcane Development Programme (under RKVY)	11.42	32.57	38.00	81.99
7	Dryland Farming Mission	447.00	162.40	229.41	838.81
8	Dryland Area Development (Under National Sustainable Farming Mission)	40.30	35.00	43.00	118.30
9	Village seed Production Programme	0.08	0.00	0.55	0.63
10	National Oilseed Development Programme	59.47	22.29	128.00	209.76
11	Cropsap	20.75	31.17	23.98	75.90
12	Information Suport for Agri under RKVV	1.23	6.43	10.80	18.46
13	A3p	244.39	391.00	0.00	635.39
14	Organic Forming	5.23	1.96	0.41	7.60
	Total	1796.00	1493.98	2054.15	5344.13
	Animal Husbandry				
15	Other Tribal Scheme	10.00	15.00	25.00	50.00
16	Scheme of supply of improoved milch breed to special Component	30.00	25.00	35.00	90.00
17	Supply of fodder seeds	20.00	20.00	25.00	65.00
	Total	60.00	60.00	85.00	205.00
	Dairy.Development				
18	Management & Extension in Dairy Development Programme	50.00	40.00	70.00	160.00
19	Establishment of fMilk Routes	75.00	100.00	200.00	375.00
	Total	125.00	140.00	270.00	535.00
	Sericulture				

20	Purchase of silkworm cocoons	7.00	12.50	15.00	34.50
21	Supply of malbery Cutings Disease free eggs	5.00	10.00	12.00	27.00
	Total	12.00	22.50	27.00	61.50
	Fisheries				
22	stocking of fish seed in impounded water	125.00	125.00	125.00	375.00
23	Subsidy for fisheries requisites	15.00	15.00	15.00	45.00
	Total	140.00	140.00	140.00	420.00
	Social forestry				
24	Gut Plantation	39.27	41.80	45.40	126.47
25	Private land Plantation	292.80	353.95	255.00	901.75
26	Road side Plantation	108.00	116.25	151.10	375.35
	Total	440.07	512.00	451.50	1403.57
	Grand Total -	2573.07	2368.48	3027.65	7969.20

PROJECTED OUTCOMES AND GROWTH RATES DURING XT FYP.

EXPECTED OUTCOMES AS A RESULT OF IMPLEMENTATION OF THE PLAN:

This comprehensive district Agriculture plan C-DAP, has been prepared under the guidelines of the RKVY. It deals with all these issues comprehensively. It attempts to provide solutions to overcome several impediments which are presently obstructing the development process. It presents scores of actionable projects, schemes, and programmes which, if implemented properly will help the district to shed out its agricultural backwardness and to take off on a fast growth track of much higher than 4% per annum growth of agricultural production.

As a result of implementation of the CDAP all sectors are expected to have a substantial addition to the gross production in the district.

TABLE –6. 2
GROSS VALUE ADDED IN VARIOUS SECTORS PARBHANI DISTRICT 2012-2017

Sr. no.	Sector	3 years average gross value 2006-07 to 2010-12 in lakh	Gross value 2016-17 in lakhs	Compound annual growth rate %
1	Agriculture	122669.00	170916.00	6.86
2	Horticulture	16210.86	45886.55	23.10
3	Animal Husbandry	2344.00	3170.00	6.22
4	Sericulture	15.03	27.00	12.42
5	Fisheries	16440.00	20340.00	4.35
Total		157678.89	240339.55	8.79

Highest growth is in the horticulture sector both because of expansion of areas and increase in productivities. Significant increases in production and productivities will, however, accrue in the next four years when, very large plan investments in watershed development and minor irrigation start bearing fruit.

The proposals of C-DAP will provide employment to thousands of unemployed or partly employed people, raise standards of living in rural areas, reduce poverty and distress, and specially reach the benefits of growth and development to the thousands of small and marginal farmers who are mostly in distress today because of the non-viability of their farms and several other consequential handicaps. Naturally, this last group of small and marginal farmers and their handicaps are the focus of attention of many C-DAP proposals.

Earnest implementation of all C-DAP projects, schemes and programmes will result in simultaneous increments in productivity of each crop and each of the allied activities, in each farm in each village, and in each block in the district. Combined with improvements in credit, marketing employment and other infrastructure, the overall growth is bound to have a multiplier effect. It should be certainly possible to raise farm production and farmer incomes at least by 50% over a medium term of five years. That should mean the beginning of the Second Green Revolution. The momentum generated, the self confidence gained by the farmers in the process and the continuing upgrading of agro- technologies will continue to lift the district economy to higher and higher levels in future. Outcomes of all the efforts will remain in the farmer's hands. No one else will claim any share or tax from them. Even the access to credit will be much easier and cheaper than what it has been during the past several decades. Accomplishment of this C-DAP will thus lead to the most desired well-being of the people of the district.

OUTLAYS AND OUT COME

Total outlay (Rs. lakh)	=	Rs. 197995.15
Stream I	=	Rs. 33380.29
Stream II	=	Rs. 164614.86
Per capita outlay/ during XI plan	=	Rs. 18983
(Rural population)	=	10.43 Lakh

OUTCOME
Gross Value Added (GVA) Constant Prices

	GVA of		(Rs. lakhs)
1)	Average of 3 years 2010-11 to 2012-13	=	Rs. 157678.89
2)	GVA of final year 2016 – 17	=	Rs. 240339.55
3)	Compound Growth Rate	=	8.79 %
4)	Improvements in Gross value per from	=	Rs. 39901
	Cultivator to	=	Rs. 60819
5)	Improvement in GVA per annum per capita (rural population)	=	Rs. 15118 to 23043