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AGRICULTURAL POLICY IN MADHYA PRADESH: A POLICY MATRIX IN A FEDERAL STRUCTURE

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PREFACE

The present study has been assigned by the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India to all the Agro-Economic Research Centres of the country under the coordinationship of ADRT, Institute for Social and Economic Change (ISEC). Bangalore and Centre for Management in Agriculture (CMA), Indian Institute of Management (IIM), Ahmedabad. This Centre took up this study for the State of Madhya Pradesh.

The present agricultural scenario of the state has changed considerably. The inequity between rich and poor farmers has widened, land, water and forest resources have degraded and soybean based cropping systems are under threat from disease, pests and complex deficiencies and disorders. It is high time to face these challenges and again play a pivotal role to develop and disseminate an alternative technology on farm front to ensure nutritional and food security for rapidly increasing population without degrading the natural resources of the State.

Now the country is looking for another green revolution which has to be ever green i.e. sustainable. Madhya Pradesh is one of such States which has the potential and promise for witnessing evergreen revolution, particularly from its large rainfed areas. Diversification of agriculture is another very vital need of the State. The change has to be from food crops to cash crops, from waste lands to raising of fruits, fodder and fuel yielding plants and from crop component alone to a mixed system including crop-animal and fodder components. The floriculture, olericulture and apiculture must receive higher priority in research and technology generation.

This study presents our past achievements, strength, weaknesses, opportunities, threats, issues and future strategies. It provides a framework of programmes for meeting the new goals and effectively addressing the new challenges and to exploit opportunities ahead.

Agriculture and allied activities occupy an important place in the economy of Madhya Pradesh. Nearly 74 per cent of its population lives in villages and directly or indirectly dependent on agriculture and allied activities for its livelihood. The agriculture is the core of the state's economy and agriculture development is a sine-qua-non of overall development of the State. In a predominantly agrarian economy, agriculture development is a pre-requisite for overall development and hence deserve a very high priority.

In this study, after analyzing the patterns of development in agriculture and allied sectors, constraints operating in these sectors are identified against the background of the schemes and programmes implemented in the State. Based on the constraints and available potential, initiatives required for the development are suggested in an excellent manner.

The present study was conducted by Dr. S.K. Gupta, Principal Scientist of this Centre who planned the study design, conducted field investigation, tabulation and analysis and drafted the report.

I express my deep sense of gratitude to the officials in the Directorate of Economics and Statistics, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, New Delhi for entrusting this study to his centre.

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I, on behalf of the Centre express its deep sense of gratitude to Hon'ble Vice-Chancellor, Dr.D.P.Singh, Director Research Services, Dr.V.S. Tomar, Dean, Faculty of Agriculture, Dr. R. K. Gupta, Director Extension Services, Dr. R. A. Khan, Dean, College of Agriculture, Dr. C. B. Singh and other officials of J.N. Krishi Vishwa Vidyalaya, Jabalpur for providing all facilities and help at various stages in successful completion of this study of high importance.

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I would also offer my thanks to Mr. Sikandar Khan who took painstaking job of doing the computer typing of the report.

I hope the finding and suggestions made out of the study would be useful to policy makers of the State and Govt. of India.

(P.K. Mishra)
Professor & Head

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CHAPTER - I
INTRODUCTION

1.1 Introductory

Indian agriculture has made rapid strides over the past 50 years. It has contributed significantly to achieve self sufficiency in food production and avoiding food shortages. Food grain production has reached about 210 million tonnes (2000-01) from a mere 51 million tonnes in the early fifties. Still, the agricultural sector faces a number of constraints, in its growth pattern such as (i) uneven development across regions, crops and across different sections of the farming community, (ii) low level of productivity and iii) degradation of natural resources in some areas.

Economic viability of the agricultural sector is affected by (i) capital inadequacy ii) lack of infrastructure support, (iii) demand side constraints such as controls on movement, storage and sale of agricultural products, etc. These constraints pulled down the rate of growth of agriculture during nineties. Agriculture has also become a relatively unrewarding profession due to generally unfavourable price regime imposed by the government and low value addition. There was no agricultural policy resolution so far. But the agricultural policy followed the statements that were made in the Plan Documents. Many of the measures taken in the past were either for crises management, or for political gains; otherwise backwardness of Indian agriculture cannot be explained. Among the available material, the High Power Committee Report touches the important aspect of improving the human resource base to boost up the sector. This report rightly suggests, "Indian agriculture need not remain backward and the rural masses amongst the poorest in the world. Both can be uplifted by improving the human resources base increasing the farmers' efficiency through greater use of science and technology, suited to their conditions and placing them at par with others in prices, incomes, facilities and opportunities.

Policy can be considered as a response of the government indicating its position on an area of significant concern to a political and administrative system. Such sectors are of course connected with the other segments of the economy, and more than that, with the polity, bureaucracy and the outside pressure groups. Inter-relatedness of policies and their outcomes therefore cannot be fully explored a priori but their probable direction of impact

can be visualized. Hence the study of policy making will require understanding of the institutional dynamics and case studies in order to analyse the emergence of the situation and the resolution of possible conflicts in goals. One of the important points of discord and subsequent resolutions is the understanding between the Central and the State Governments, even keeping aside the other important players for a moment.

According to the Indian constitution, agriculture is a State subject and most of the implementation part is under the State Governments, but many facets of the sector are either in the Central list or under the concurrent list. Even being on the State list, the policies pertaining to agriculture are mostly initiated at the centre, sometime after consultation with the State.

During the last two decades, there were a few attempts to formulate a National Agricultural Policy. A policy document was finally introduced in the monsoon session of the *Lok Sabha* in July, 2000. Barring this, during the last five decades, no serious attempt was made to formulate a meaningful document on agricultural policy. The National Agricultural Policy is an attempt to provide the broad direction of agricultural development in the coming years. It provides a national policy perspective with which the State Governments may attune their programmes, schemes and priorities. The policy recognises the necessity for differentiated strategies based on regional realities and requirements. The implementation of these strategies, as well as many of the action points under the National Agricultural Policy, lie with the State Governments. The flexibility bestowed on State Governments would also entail an enhanced level of accountability. In order to ensure effective implementation of programmes, suitable monitoring and evaluation mechanism would be put in place.

Agricultural policy generally followed the framework given under various plan documents. Any attempt to formulate policy for agricultural sector needs active participation of the players at the state level. Among the important interest groups we have the polity, administrators, bankers, farm leaders, academicians, processors and traders, agricultural labour unions, NGOs engaged in agriculture and rural development activities and other stakeholders. It is necessary that the policy statement emerges out of the felt needs and resource availability at these locales. Such policy statement will emerge as a matrix having

the States on one axis and the felt needs on the other. The cells will speak about the type of initiatives needed for handling the underlying issues.

The Agro-Economic Research Centre for Madhya Pradesh and Chhattisgarh, JNKVV, Jabalpur was asked by Ministry of Agriculture, Government of India to conduct a research study on "Agricultural Policy in Madhya Pradesh: A Policy Matrix in a Federal Structure". The study has been coordinated by Centre for Management in Agriculture (CMA), Indian Institute of Management (IIM), Ahmedabad and Institute of Social & Economic Change, Bangalore. For this study data were collected from various five year plan documents of the State Government and other agricultural statistics of Govt. of M.P. A questionnaire/ schedule was prepared to know the impact of WTO commitment on state agriculture. Various important stakeholders like administrators, bankers, farm leaders, political leaders, scientists, academicians, processors and traders, agricultural labour unions, NGO's engaged in agriculture and rural development activities and others in the state were contacted. A total of 48 stakeholders were contacted but only 12 (25 per cent) Stakeholders responded. Most of the stakeholders were unaware about the WTO agreement.

This report is based on whatever information and data that were available during the study period. Data was a major constraint that determined the confines of the study. As a result, full justice could not be given to some of the points mentioned in the terms of reference. For this project the State of Madhya Pradesh was selected.

1.2 Objectives

Keeping in view the above stated background and considerations, the present study focusses on the following specific objectives.

(1) To review the available material (Five Year Plan Documents at state level, policy statements made at the state level, etc.) dealing with policy interventions after the formation of the state in 1956.

(2) To identify important constraints and review the efforts made by the state government in the past to meet major challenges pertaining to agriculture and allied activities.

(3) To record the state's response to the already formulated National Agricultural policy, that is, to find out precisely how and where the State would like to suitably supplement, modify and re-articulate the National Policy in the local context.

(4) To bring out the state's concerns as well as to record the state's views on the changing economic situation due to India's involvement with the WTO.

(5) To document the state's initiatives to meet the problems and constraints arising out of India's WTO commitments and review in brief the effectiveness of government interventions in the form of technology adoptions, institutional adaptations, price policy changes (e.g. through changes in tax and subsidy regimes) and legal policy changes undertaken so far.

(6) To discuss with the important stakeholders the requirements for formulation of a policy document at the state level, in response to the country's growing concerns at home and abroad (i.e., in response to challenges arising from WTO or otherwise).

(7) To elaborate on the initiatives taken to meet the challenge of diversification, technology, resource management and price policy at the state level (whether in response to WTO or otherwise).

(8) To assemble these views in the form of a meaningful policy requirement matrix, relating problems/ issues to action points suggested/ recommended and also trying to spell out the agencies, which should undertake such actions.

1.3 Methodology

The methodology for the study involves a thematic review of the existing material at State level and interviews with the stakeholders on crucial issues. The State level exercise should take into consideration (i) the documents prepared by the Agro-climatic regional planning groups across various states, (ii) strategy papers prepared by some of the State Governments in response to WTO or otherwise. Plan documents both at Centre and State level should be reviewed. The expected output from the first two stages of this exercise will be a systematic policy document for the concerned stage. Although interaction with important stakeholders of the state agriculture would be useful to get access to prevailing and pre-existing documents and thus to bring out the current policy status during the first two

stages of the study, such interaction would be of crucial importance during the third and last stage of the exercise. Obviously, the spirit of this interaction would be positivist (i.e., to bring out the prevailing factual position without any ideological or normative preoccupation) during the first two stages, while it has to be essentially normative in nature (i.e., to bring out the desirable features as per the wishes and aspirations of various stakeholders) during the last stage. Conflicts in desired policy changes across stakeholder groups would be an essential feature, which the study should bring out together with feasible prescriptive measures to resolve those conflicts.

While reviewing or analysing agricultural policy of Indian States the thrust would be to bring out the existing as well as the required policy structure having impact on (a) the sources of income and employment of the farmer, (b) the farmer's investment opportunities (c) the farmer's access to knowledge, education, information and skill, and, (d) empowerment of the farmers in terms of improvement in his socio-economic standing and decision making power.

Thus, the thrust of this study would be to bring together all policy issues that have a direct or indirect bearing on all these aspects.

While reviewing the policy issues as well as policy options in the post WTO scenario, all relevant WTO agreements impinging on any of these aspects ought to be covered. Thus, each important stakeholder of State Agriculture may be approached to record the views (both positive and negative together with the reasoning), which have direct or indirect bearings on the farmer.

1.4 Plan of the Report

This report is organised into 5 chapters.

I. Introduction
II. Agricultural Development Scenario of the State
III. Major Initiatives in Agricultural Development
IV. The Constraint analysis of Agricultural Development in the State
V. Towards Agricultural Policy for the State, and References

1.5 Background of the State of Madhya Pradesh

The undivided State of Madhya Pradesh was formed on 1st November, 1956 comprising 43 districts: 17 districts of Mahakoshal, 2 districts of Bhopal, 8 districts of Vindhya Pradesh and 16 districts of Madhya Bharat. Subsequently two large districts were bifurcated to have a total of 45 districts. Sixteen more districts were formed in the year 1998. The reorganised (new) State of Madhya Pradesh came into existence on 1st November, 2000 following bifurcation of earlier Madhya Pradesh to create a new state of Chhattisgarh comprising of 16 districts. The new state of Madhya Pradesh is situated in the heart of the country and surrounded by Chhattisgarh state in the east, Rajasthan and Gujarat in the West, Uttar Pradesh and Jharkhand in the north and Maharashtra in the south (**Map**).

The State of Madhya Pradesh lies between 17º2' N and 26º52'N latitudes and 74º2'E and 84º02'E longitudes. Areawise, it is the second largest state in the country and ranks seventh in terms of population. The general elevation varies from 150 to 600 metres above mean sea level. It receives rainfall mainly through southwest monsoon ranging from 800 mm in the north west to 1600 mm in south west.

The State has extensive mineral and forest resources, rich and fertile soil and reasonably abundant water resources. Unfortunately, inspite of the State Government making all efforts, so that it can make rapid strides in the direction of economic and social advancement, the pace has been slow so far. The reason for this is partly historical and partly economic.

The State has at present 9 revenue divisions, 45 districts, 259 tehsils, 313 Community Development Blocks, including 129 Tribal Development Blocks and 55,393 villages. (Table 1.1).

1.5.1 Population

According to the census 2001, the total population of the State is 603.85 lakhs forming 5.88 per cent of the population of the country. Of this the male population is 314.57 lakhs and female population, 289.28 lakhs. Thus, the sex ratio of females per thousand males comes to 920 as against 933 for the country. Out of the total population, the urban

population is 161.02 lakhs and rural population is 442.83 lakhs. Thus, the percentage ratio of rural : urban population is 73:27. The State is basically rural in nature. The decennial growth rate is 24.34 as against 21.34 for the country as a whole. The density of population is far lower in the State (196 persons per sq.km.) as compared to the all India average of 324 (Table 1.1).

Table 1.1 Population Statistics - 2001

(Unit - Lakh)

S.No.	Particulars	India	Madhya Pradesh
1	Total Population	10,270.15	603.85
	a) Male	5,312.78	314.57
	b) Female	4,957.38	289.28
	c) Urban	---	161.02
	d) Rural	---	442.83
2	Decennial growth rate	21.34	24.34
3	Density per Sq.km.	324	196
4	Sex Ratio (Females per thousand males)	933.00	920.00
5	Literacy Percentage	65.38	64.11
	a) Male	75.85	76.80
	b) Female	54.16	50.28
6	No. of Revenue Divisions	N.A.	9
7	No. of Districts	585	45
8	No. of Tehsils	---	259
9	No. of Villages	6,05,224	55,393
10	No. C.D. Blocks	---	313

Source : Census of India 2001

According to the 1991census another significant aspect is the high concentration of tribal population in the state. The percentage of scheduled tribes and scheduled castes population to the total population of the state is 19.9 and 15.4 respectively.

The work participation rate in the state is 36.1 which is higher than the all India average of 34.1. This is mainly due to higher female participation rate of 26.3 per cent in Madhya Pradesh.

The literacy percentage in the state for population aged seven years and above is 64.11 as against65.38 for India. In the matter of male literacy, the state edged a bit better (76.80) than the country as a whole (75.85). In the case of female literacy however, it lagged bit behind (50.28) the nation (54.16) (Table 1.1).

The life expectancy in the State is 57 years for males and 56 years for females, as against 62 years and 63 years respectively for India.

1.5.2 Working Population

Of the total population 42.75 per cent are workers and the remaining 57.25 per cent, non-workers. The non-workers include children and the old and infirm.

The rural background of the State is confirmed by the nature of work the population is engaged in. It is noted that of the total workers, 42.93 per cent are cultivators and 28.66 per cent agricultural labourers, together forming 71.59 per cent. This chunk of population can be termed as engaged in agricultural pursuits. While "other" workers formed 24.49 per cent, workers engaged in household industries formed 3.92 per cent (Table 1.2).

Table 1.2 Details of working population, Madhya Pradesh 2001

Particulars			Number	Percentage
1	Total population		6,02,52,739	---
2	Rural population		4,42,88,038	---
3	Percentage to total population		---	73.50
4	Urban population		1,59,64,702	---
5	Percentage to total population		---	26.50
6	Total workers		2,57,56,481	---
7	Percentage to total population		---	42.75
	a)	Cultivators	1,10,58,500	---
		Percentage to total workers	---	42.93
	b)	Agricultural labourers	73,80,878	---
		Percentage to total workers	---	28.66
	c)	Household Industry workers	10,10,067	---
		Percentage to total workers	---	3.92
	d)	Other workers	63,07,046	---
		Percentage to total workers	---	24.49

1.5.3 Physiography

The State is nearly centrally located in the country. The State is interspersed with hills, plateaus, plains and rivers. It has undulating topography coupled with deep rivers resulting in acute soil erosion and run off water. Major perennial rivers of the State are the Narmada, the Mahi, the Tapti, the Chambal, the Betwa, the Sone, the Wainganga, the Ken

and the Pench. These rivers originate in M.P. and flow to the five bordering States. The main hill regions of the State are northern hills region of Chhattisgarh, Satpura hills and Jhabua hills. Nearly 25 per cent of the geographical area is categorised as area not available for cultivation, barren and uncultivated land, cultivable waste and fallow land. Forest which form 27.81 per cent of the geographical area are far below the ideal percentage of 33.

1.5.4 Soils

The State comprises of a wide variety of soils ranging from mixed red and black soils to alluvial soils, shallow and medium black soils to deep medium black soils. It may be noted that 36.53 per cent of the area and 30 districts of the state come under deep medium black soil. Next important soil type is mixed red and black soil occupying 18.30 per cent area of the State comprising 8 districts. While alluvial soils are localized in 4 districts occupy 7.57 per cent area of the State, and, shallow and medium black soils occupying 6.91 per cent area are localised in 3 districts (Table 1.3).

Table 1.3 Distribution of soils of Madhya Pradesh

S. No.	Type of soils Area and (Percentage)	No. of Districts	Name of Districts
1	Shallow & Medium Black Soil, Area 3.06 m.Ha. and (6.91%)	03	Betul, Chhindwara and Seoni
2	Deep Medium Black Soil, Area 16.21 m.ha. and (36.53%)	30	Narsinghpur, Hoshangabad, Harda, Shahdol, Umariya, Jabalpur, Katni, Sagar, Damoh, Vidisha, Raisen, Bhopal, Sehore, Rajgarh, Ujjain, Dewas, Shajapur, Mandsaur, Neemuch, Ratlam, Jhabua, Dhar, Indore, Khargone, Barwani, Khandwa, Guna, Shivpuri, Datia and Sidhi.
3	Alluvial Soil, Area 3.35 m.Ha. and (7.57%)	04	Gwalior, Morena, Sheopurkala, Bhind
4	Mixed Red & Black Soil Area 8.11 m.Ha. and (18.30%)	08	Mandla, Dindori, Balaghat, Rewa, Satna, Panna, Chhatarpur, Tikamgarh

1.5.5 Agro-Climatic Regions, Crop Zones and Rainfall

The state has been divided into 11 agro-climatic regions and 5 crop zones. The state lies in the northern hemisphere and has a hot and dry climate except for the rainy season which is from July to September. The summer is very hot in May and winter is very cold in January.

The rainfall varies from a minimum of 800 mm in Bundelkhand region to a maximum of 1,600 in the Chhattisgarh plains and Northern Hill region of Chhattisgarh (Table 1.4).

Table 1.4 Agro-Climatic Regions and rainfall, Madhya Pradesh

S. No	Agro-Climatic Region	Crop Zones	Rainfall Range in m.m.	District covered
1	Chhattisgarh Plains	Rice zone	1,200 to 1,600	Balaghat
2	Northern Hills Region of Chhattisgarh	Rice zone	1,200 to 1,600	Shahdol, Mandla, Umaria and Dindori
3	Kymore Plateau & Satpura Hills	Rice-Wheat zone	1,000 to 1,400	Rewa, Satna, Panna, Jabalpur, Seoni, Sidhi, Katni
4	Central Narmada Valley	Wheat zone	1,200 to 1,600	Narsinghpur, Hoshangabad and Harda
5	Vindhya Plateau	Wheat zone	1,200 to 1,400	Bhopal, Sagar, Damoh, Vidisha, Raisen and Sehore
6	Gird Region	Wheat-Jowar zone	800 to 1,000	Gwalior, Bhind, Morena, Sheopurkala, Shivpuri & Guna
7	Bundelkhand Region	Wheat-Jowar zone	800 to 1,400	Chhattarpur, Datia, Tikamgarh
8	Satpura Plateau	Wheat-Jowar zone	1,000 to 1,200	Behul and Chhindwara
9	Malwa Plateau	Cotton-Jowar Zone	800 to 1,200	Mandsaur, Ratlam, Ujjain, Dewas, Indore, Shajapur, Rajgarh and Dhar
10	Nimar Plains	Cotton-Jowar Zone	800 to 1,000	Khandwa, Khargone & Badwani
11	Jhabua Hills	Cotton-Jowar Zone	800 to 1,000	Jhabua

1.5.6 Number and Area of Operational Holdings

As per the Agricultural census of 1995-96 an area of 165.78 lakh hectares is owned by 66.37 lakh landholders and category wise classification in as under :-

An area of 35.74 lakh hectares is owned by 40.44 lakh landholders, whereas an area of 130.04 lakh hectares is owned by 25.93 lakh land holders. It means that the percentage number of marginal and small farmers is more than the percentage of cultivated area and the percentage number of "other" farmers (medium and large) is less than the percentage of area cultivated showing that the distribution of land among owners is skewed (Table 1.5).

Table 1.5 Number and area of operational holdings, Madhya Pradesh

S.No.	Type/ Category	Number (in lakh)	Percentage	Area owned (Lakh hect.)	Percentage
1	Marginal holdings	23.56 40.44	35.50	11.36 35.74	6.85
2	Small holdings	16.88	25.43	24.38	14.71
3	Others	25.93	39.07	130.04	78.44
	Total	66.37	100.00	165.78	100.00

Source : Agricultural Census 1995-96

1.5.7 An Overview of Agricultural Development Scenario of Madhya Pradesh State Since Independence

Agriculture and allied activities occupy an important place in the economy of Madhya Pradesh. This is evident from the fact that 73.50 per cent of its population lives in villages and of this 71.59 per cent directly or indirectly dependent on agriculture and allied activities for its livelihood. The agriculture and allied activities contribute about 44 per cent of the state's net domestic product, about 48 per cent of the State's gross domestic product. Thus, agriculture is the core of the state's economy and agricultural development is a sine qua non of overall development of the state. In a predominantly agrarian economy, agriculture development is a pre-requisite for overall development and hence deserves a very high priority.

Although Madhya Pradesh has made reasonably good progress in agricultural production in the recent years, its performance in improving the economic status of farmers, especially marginal and small farmers, has not been satisfactory. The percentage of people below poverty line (BPL) is still relatively high. It is 44.10 per cent in rural areas and 38.31 per cent in urban areas (2000-2001). In spite of making some strides in the agricultural sector, the yield rates of major crops in the State are low. The lower yields in the state are partly due to smaller irrigation facilities and lower consumption of fertilizers. The average per capita income is low. In view of this, there is urgent need for the Government of Madhya Pradesh to step up both the level and pace of agricultural development in the State through appropriate policy measures.

Duly recognising the need for formulating an agricultural policy for the State and following the initiatives of the Government of India, it is decided to undertake an exercise to prepare a document on agricultural policy of Madhya Pradesh. The main goal of the exercise is to put the agriculture of M.P. on a steady growth path and improve the quality of life of farmers on a sustainable basis.

The performance of agriculture in M.P., especially the crops was dismal upto 1980-83. But after 1980-83, the growth of output in M.P. increased sharply and it was higher than the all India growth rate. Incidentally, this was also the period when incidence of poverty started declining. Thus, the agricultural growth had a significant impact on reduction of poverty in Madhya Pradesh. Despite general improvement in food availability, hunger and malnutrition still exist. Therefore, removing hunger and malnutrition should form the core strategy for agriculture and rural development in the state.

Taking a cue from the exercise undertaken by Govt. of India to formulate a National Agriculture Policy, the Ministry of Agriculture, Govt. of India decided to undertake a similar exercise at the state level to not only put its agriculture on a steady growth path but also to take into account the requirement of sustainability. The State intends to promote sustainable agriculture with growing farm income and specifically address the needs of small and marginal farmers.

Given the predominant role of agriculture in the economy of M.P., it is necessary for us to understand and analyse its current status in terms of area, production and yield of major crops grown in the state, irrigated area, fertilizer use, consumption of pesticides, coverage under HYVs, use of implements and machinery, constraints on its development and opportunities for future growth and development as a basis for proposing a policy framework and a strategic action plan for its development.

1.5.8 Land use Classification

The total geographical area of the state was 443.46 lakh hectares but got reduced to 307.50 lakh hectares after the creation of Chhattisgarh State on November 1st, 2000. Nearly

half (49.21 per cent) of it was net sown area. The area under forest formed 27.62 per cent, about 5 per cent less than the desirable percentage of 33.00. In fact, the decline in percentage of forest area of the state from about one-third to 27.62 per cent has been a significant change for the state due to creation of Chhattisgarh State. The area not available for cultivation formed 10.38 per cent. Besides this, area under uncultivable land formed 5.58 per cent, cultivable wasteland, 3.82 per cent and fallow land, 3.38 per cent. These categories of land are prone to loss due to various kinds of erosions including run off. It is, therefore, suggested that high priority be given to the conservation of land and water resources of the State (Table 1.6).

Table 1.6 Land use classification of Madhya Pradesh (1999-2000)

Area - (Lakh Hectares)

S. No.	Particulars	1997-98	1999-2000*	% to total geographical area
1	Geographical area	443.46	307.50	100.00
2	Forest	145.97	86.13	27.62
3	Land not available for cultivation	42.29	32.00	10.38
	a) Land put to non-agricultural uses	25.15	18.35	6.00
	b) Barren & uncultivable land	17.14	13.65	4.38
4	Other uncultivable land excluding fallow land	26.41	16.73	5.58
	a) Permanent pastures and grazing land	26.21	16.58	5.53
	b) Land under misc. tree crops and groves	0.20	0.15	0.05
5	Cultivable waste land	14.56	11.70	3.82
6	Fallow land	14.82	10.24	3.38
	a) Current fallow	7.19	4.86	1.62
	b) Old fallow	7.63	5.38	1.76
7	Net area sown	199.40	150.70	49.21
8	Area sown more than once	61.30	53.49	35.37
9	Gross cropped area	260.71	204.19	---
10	Kharif area	157.18	109.36	53.56
11	Rabi area	103.53	94.83	46.44
12	Cropping Intensity (%)	134	135	

* 1999-2000 - Information pertains to the reorganised (new) state.
***Source** : Commissioner Land Records, M.P.*

Keeping in view its new geographical boundaries and the reduced area under forests, the state will have to review its plans for afforestation. In addition, part of its unproductive wastelands can also be brought under tree cover or any other suitable canopy.

Another aspect of this problem is the increasing pressure on land due to increasing population. The population of the State grew by 27.2 per cent between 1981-1991 and the decadal growth between 1991-2000 is estimated to be 24.3 per cent. Although the density of population at 196 persons per sq.km. is less than India's average density of 324, so are the resources of the State. It is likely that the growing pressure of population will speed up the pace of forest and land degradation unless appropriate interventions are made to reverse this phenomenon.

A situation seems to be emerging wherein growth in population will further increase the pressure on critical natural resources like forest, land and water. There are reports revealing a decline in the quality of forest in the state. The other important concern is land degradation. In fact, as per the estimates of National Wasteland Development Board made in 1986, State has the largest degraded land. Nearly half of the geographical area of the state suffers from degradation.

One of the important reasons for the degradation of land in the state is the undulating topography characterised by low mountain ranges, hill mounds, narrow valleys and rivers resulting in excessive surface run off and soil erosion. This land needs to be reclaimed using the funds available under various programmes and put to productive uses such as agro-forestry, social forestry and dry land horticulture. Another concern is the low and stagnant productivity of food grains. During the course of field work, the farmers complained about soil degradation and depletion of groundwater due to indiscriminate extraction. The time is ripe for the State government to take measures for replenishing the depleting natural resources and augmenting them to achieve a delicate balance between "agricultural growth" and its sustainability.

1.5.9 Irrigation by Sources

The net irrigated area in the state was 829 thousand hectares (undivided M.P.) in 1956-57. In 1999-2000 it increased to 5,661 thousand hectares (6.83 times). In the year 1956-57, the main sources of irrigation were canals which contributed 47.05 per cent of the net irrigated area (829.00 thousand hectares). The next important sources of irrigation were

wells and tubewells and commanded 35.46 per cent of the net irrigated area followed by tanks (13.15 per cent). Other sources formed 4.34 per cent. The gross irrigated area was 839 thousand hectares. The percentage of net irrigated area to net area sown was 5.3 and percentage of gross irrigated area to gross cropped area was 4.8.

But in the year 1999-2000, the main sources of irrigation were shifted from canals to wells and tubewells, which commanded 65.57 per cent of the net irrigated area. Canals contributed 17.70 per cent and tanks, 2.33 per cent. Other sources formed 14.40 per cent. The area irrigated more than once was 167 thousand hectares. Thus, the gross irrigated area was 5,828 thousand hectares. The percentage of net irrigated area to net area sown was 37.6 and percentage of gross irrigated area to gross cropped area was 28.5 (Table 1.7).

Table 1.7 Area irrigated by different sources, Madhya Pradesh during different plans

(Area – Thousand Hectares)

Year	Canals	Tanks	Well + Tubewells	Other sources	Net irrigated area	Area irrigated more than once	Gross irri-gated area	percentage of net irrigated area to net area sown	Percentage of gross irrigated area to gross area sown
1956-57	390 (47.05)	109 (13.15)	294 (35.46)	36 (4.34)	829 (100.00)	10	839	5.3	4.8
1960-61	441 (47.73)	122 (13.21)	324 (35.06)	37 (4.00)	924 (100.00)	14	938	5.7	5.2
1965-66	461 (47.23)	118 (12.09)	345 (35.35)	52 (5.33)	976 (100.00)	24	1,000	5.9	5.6
1973-74	713 (43.35)	119 (7.23)	676 (41.09)	137 (8.33)	1,645 (100.00)	88	1,733	8.9	8.2
1978-79	1,065 (46.00)	140 (6.05)	943 (40.74)	167 (7.21)	2,315 (100.00)	98	2,413	12.3	11.1
1984-85	1,267 (42.09)	204 (6.78)	1,285 (42.69)	254 (8.44)	3,010 (100.00)	96	3,106	15.7	13.9
1989-90	1,501 (41.33)	157 (4.32)	1,718 (47.30)	256 (7.05)	3,632 (100.00)	107	3,739	18.8	16.6
1996-97	1,805 (28.61)	189 (3.00)	3,470 (55.01)	844 (13.38)	6,308 (100.00)	249	6,557	31.7	25.6
1999-2000 (New M.P.)	1,002 (17.70)	132 (2.33)	3,712 (65.57)	815 (14.40)	5,661 (100.00)	167	5,828	37.6	28.5

Source: Commissioner, Land Records, M.P.

1.5.10 Cropwise irrigated area

In the year 1956-57, the most important irrigated crop was paddy which occupied 56.7 per cent of the gross irrigated area. Wheat was another important irrigated crop occupying 19.70 per cent followed by sugarcane (5.27 per cent), barley (5.14 per cent), gram (4.00 per cent), fruits & vegetables (2.27 per cent) and spices and condiments (2.17 per cent).

In the year 1999-2000, the gross irrigated area was 5,827.7 thousand hectares, which was nearly 7 times more than the gross irrigated area of 1956-57. In the recent year, the most important irrigated crop was wheat which occupied 58.32 per cent of gross irrigated area followed by gram (16.14 per cent), oilseeds (5.53 per cent), paddy (4.18 per cent), spices (4.01 per cent) and fruits & vegetables (3.18 per cent) (Table 1.8).

Table 1.8 Cropwise Irrigated area in Madhya Pradesh during different plans

(Unit - '000 hectares)

Crops	**1956-57**	**1960-61**	**1965-66**	**1973-74**	**1978-79**	**1984-85**	**1989-90**	**1996-97**	**(New M.P.) 1999-2000**
Paddy	475.4 (56.7)	484.1 (51.59)	489.5 (48.95)	600.7 (34.67)	821.2 (34.03)	956.7 (30.80)	1019.6 (27.27)	1262.1 (19.25)	243.5 (4.18)
Maize	4.6 (0.55)	2.7 (0.29)	9.5 (0.95)	1.5 (0.08)	3.1 (0.13)	5.2 (0.17)	8.7 (0.23)	11.6 (0.18)	11.0 (0.19)
Wheat	165.3 (19.70)	191.2 (20.37)	204.8 (20.48)	674.6 (38.94)	979.8 (40.60)	1,291.2 (41.57)	1,543.2 (41.27)	3,049.6 (46.51)	3,398.8 (58.32)
Barley	43.2 (5.14)	43.8 (4.67)	45.4 (4.54)	54.1 (3.12)	52.6 (2.18)	35.6 (1.15)	23.4 (0.62)	29.0 (0.44)	29.1 (0.50)
Others	3.1 (0.37)	2.9 (0.31)	2.8 (0.27)	2.6 (0.15)	2.5 (0.10)	2.1 (0.07)	1.9 (0.05)	1.3 (0.02)	1.1 (0.02)
Total Cereals	691.6 (82.43)	724.7 (77.23)	752.0 (75.19)	1,333.5 (76.97)	1,859.2 (77.04)	2,290.8 (73.76)	2,596.8 (69.44)	4,353.6 (66.40)	3,683.5 (63.21)
Gram	33.6 (4.00)	36.2 (3.86)	55.0 (5.50)	116.4 (6.72)	124.2 (5.15)	263.2 (8.47)	451.9 (12.08)	941.0 (14.35)	940.9 (16.14)
Other Pulses	12.3 (1.47)	12.1 (1.29)	15.3 (1.53)	22.3 (1.29)	22.7 (0.94)	28.4 (0.91)	26.9 (0.72)	118.8 (1.81)	137.5 (2.36)
Total Pulses	45.9 (5.47)	48.3 (5.15)	70.3 (7.03)	138.7 (8.00)	146.9 (6.09)	291.6 (9.39)	478.8 (12.80)	1,059.9 (16.16)	1,078.4 (18.50)
Oilseeds	9.6 (1.14)	15.0 (1.60)	12.5 (1.25)	50.4 (2.91)	61.0 (2.53)	137.0 (4.41)	177.2 (4.74)	458.1 (6.99)	322.0 (5.53)
Sugarcane	44.2 (5.27)	47.4 (5.05)	70.6 (7.06)	63.3 (3.65)	104.5 (4.33)	76.9 (2.47)	67.7 (1.81)	69.8 (1.06)	75.5 (1.29)
Cotton	3.4 (0.40)	3.8 (0.40)	4.9 (0.49)	12.5 (0.72)	57.8 (2.39)	66.2 (2.13)	135.9 (3.63)	189.4 (2.89)	193.7 (3.32)
Spices & Condiments	18.2 (2.17)	42.5 (4.53)	40.2 (4.02)	60.1 (3.47)	77.2 (3.20)	102.1 (3.29)	120.5 (3.22)	191.5 (2.92)	233.6 (4.01)
Fruits & Vegetables	19.1 (2.27)	46.2 (4.92)	45.5 (4.55)	58.0 (3.35)	78.4 (3.25)	109.0 (3.51)	128.4 (3.43)	178.2 (2.72)	185.6 (3.18)
Other crops	7.0 (0.83)	10.5 (1.12)	4.1 (0.41)	16.0 (0.92)	28.2 (1.17)	32.1 (1.03)	34.1 (0.91)	56.4 (0.86)	55.4 (0.95)
All Food Crops	819.0 (97.6)	909.1 (96.9)	978.6 (97.85)	1,653.6 (95.45)	2,266.2 (93.91)	2,870.4 (92.42)	3,392.3 (90.72)	5,853.0 (89.26)	5,256.6 (90.20)
All Non Food Crops	20.0 (2.4)	29.3 (3.1)	21.5 (2.15)	78.9 (4.55)	147.0 (6.09)	235.3 (7.58)	347.1 (9.28)	703.9 (10.74)	571.1 (9.80)
Gross Irrigated area	**839.0 (100.00)**	**938.4 (100.00)**	**1,000.1 (100.00)**	**1,732.5 (100.00)**	**2,413.2 (100.00)**	**3,105.7 (100.00)**	**3,739.4 (100.00)**	**6,556.9 (100.00)**	**5,827.7 (100.00)**

In the case of cropwise irrigated area, wheat and gram registered significant increase.

1.5.11 Cropping Pattern

The cropping pattern of the state was food crops oriented. The paddy & wheat based cropping system continues to dominate the cropping pattern of the state. The other crop, soybean, which was introduced in the state in the mid sixties, has become one of the four important crops grown in the state. These four crops, viz. paddy, wheat, soybean and gram accounted for 64.10 per cent of the gross cropped area of the state in 1996-97. The cultivation of rapeseed and mustard which looked promising few years back has remained restricted to few agro-climatic regions of the State. After division of the state in November 2000, the major paddy area shifted to Chhattisgarh State. Therefore, in the year 1999-2000 (for New M.P.), paddy accounted for 8.52 per cent of the gross cropped area of the State. For paddy, this figure was 21.09 per cent in the year 1996-97 (for undivided M.P.). The area under wheat, gram, soybean, rapeseed and mustard, vegetables and spices showed a continuous upward trend during the same period. The area under paddy kept fluctuating within a narrow range during the period while area under coarse cereals viz. jowar and minor millets showed a steady decline. The share of total cereals in the gross cropped area showed a continuous downward trend during these periods, whereas, the share of total oilseeds in the gross cropped area showed an increasing trend. The share of total food crops in the gross cropped area showed a decreasing trend, whereas, non food crops showed increasing trend during these periods.

In addition to the above changes in the cropping pattern, which primarily occurred due to changes in economic and agro-climatic regions, the state cropping pattern has also undergone noticeable changes due to its reorganisation on 1st November, 2000 (Table 1.9).

The cropping pattern of the state now looks relatively more balanced from the view point of proportion of food crops, which now occupies nearly 66.92 per cent of gross cropped area as compared to the earlier share of 71.41 per cent. Interestingly, the four major crops identified earlier, i.e., rice, wheat, soybean and gram continue to dominate the cropping pattern accounting for 65.75 per cent of the gross cropped area. However, the change has occurred in the composition of cereals basket of the state wherein paddy now occupies 4th position in terms of area covered (Wheat > soybean > gram > paddy) as compared to its top rank (paddy > wheat > soybean > gram) in undivided M.P.

Table 1.9 Trends in cropping pattern in Madhya Pradesh

(Unit- '000 hectares)

Crop	1956-57	percentage	1984-85	Percentage	Undivided M.P.		New M.P.	
					1996-97	percentage	1999- 2000	percentage
Paddy	3,892	22.07	4,957	22.02	5,396	21.09	1,740	8.52
Jowar	1,644	9.32	1,909	8.48	913	3.57	674	3.30
Maize	431	2.44	850	3.77	847	3.31	801	3.92
Wheat	3,241	18.38	3,598	15.98	4,327	16.91	4,670	22.87
Other Cereals	1,837	10.42	1,709	7.59	1,158	4.53	762	3.73
Total Cereals	11,045	62.64	13,023	57.84	12,641	49.40	8,647	42.35
Gram	1,542	8.74	2,076	9.22	2,513	9.82	2,576	12.62
Tur	359	2.03	493	2.19	372	1.45	311	1.52
Total pulses	3,622	20.54	4,844	21.52	5,034	19.67	4,226	20.70
Total Foodgrains	14,667	83.18	17,867	79.36	17,675	69.08	12,873	63.04
Sugarcane	53	0.30	37	0.16	42	0.16	43	0.21
Spices	117	0.66	152	0.67	262	1.02	293	1.43
Fruits	35	0.20	53	0.23	59	0.23	57	0.28
Vegetable	55	0.31	131	0.58	203	0.79	224	1.10
Total food crops	14,929	84.66	18,282	81.20	18,271	71.41	13,664	66.92
Soybean	---	---	987	4.38	4,166	16.28	4,440	21.74
Groundnut	333	1.89	302	1.34	255	1.00	224	1.10
Rapeseed mustard	153	0.87	355	1.58	735	2.87	626	3.07
Total Oilseeds	1,758	9.97	2,768	12.29	5,991	23.41	5,790	28.35
Cotton	768	4.35	525	2.33	520	2.03	488	2.39
Total Non Food Crops	2,704	15.33	4,232	18.80	7,316	28.59	6,755	33.08
Gross Cropped Area	17,633	100.00	22,514	100.00	25,587	100.00	20,419	100.00

Reduction in area of crops after the reorganisation of MP State

Crop category	Crop affected
Cereals	Paddy, Jowar, Minor millets
Pulses	Teora (Lathyrus), Kulthi
Oilseeds	Nigerseed, Linseed

1.5.12 Crop Production

The comparative performance of production of various crops in different periods showed that there was a tremendous increase in the production of oilseeds & pulses in M.P. The production of oilseeds increased from 483 thousand tonnes (1956-57) to 5,745 thousand tonnes (1999-2000). This increase was mainly due to the increase in the production of soybean. Similarly, the production of pulses increased from 1,625 thousand tonnes (1956-57) to 3,426 thousand tonnes in 1999-2000. This increase was mainly due to the increase in the production of gram from 1,007 thousand tonnes to 2,536 thousand tonnes during the same period. Among cereals, wheat production increased from 1,730 thousand tonnes to 8,687 thousand tonnes (Table 1.10).

Table 1.10 Production of major crops in Madhya Pradesh

(Unit - '000 tonnes)

Crop	1956-57	1984-85	1996-97	1999- 2000 (New M.P.)	Percentage share in national product
Paddy	3,316	3,761	5,979	1,750	2.0
Jowar	1,099	1,520	792	529	6.0
Maize	191	1,161	948	1,271	11.1
Wheat	1,730	3,935	7,795	8,687	11.5
Total Cereals	**6,951**	**10,952**	**15,993**	**12,638**	**6.5**
Gram	1,007	1,303	2,294	2,536	36.8
Tur	257	401	321	270	9.7
Total Pulses	**1,625**	**2,343**	**3,546**	**3,426**	**25.3**
Total Foodgrains	**8,576**	**13.295**	**19,539**	**16,064**	**7.7**
Sugarcane (Gur)	170	190	176	190	0.6
Spices	N.A.	N.A.	266	322	---
Fruits	N.A.	N.A.	1,245	1,579	---
Vegetable	N.A.	N.A.	2,850	3379	---
Soybean	---	770	3,941	4743	70.0
Groundnut	201	160	253	222	4.2
Rapeseed mustard	57	243	673	625	10.5
Total Oilseeds	**483**	**1,378**	**5,095**	**5,745**	**27.5**
Cotton	562	269	424	417	3.6

1.5.13 Contribution of State in National Agricultural Production

The state is contributing 27.5 per cent oilseeds, 25.3 per cent pulses in national kitty, which are highest shares in comparison to all other States.

Also the state is contributing 7.7 per cent share of total foodgrains in National kitty which is third highest after Uttar Pradesh (21.6 per cent) and Punjab (12.1 per cent). State is contributing 6.5 per cent share of total cereals production of the nation, which is also third highest.

In the case of gram, soybean and linseed, Madhya Pradesh has highest share in comparison to all other States. In the case of mustard the State has third highest share (10.5 per cent) after Rajasthan (44.5 per cent) and Uttar Pradesh (18.3 per cent). In the case of Wheat (11.5 per cent), arhar (9.7 per cent) and jowar kharif (6.00 per cent), the state is fourth highest producer. The position of state is fifth in kharif maize, seventh in groundnut, eighth in bajra and cotton and thirteenth in Rice (Table 1.11).

Table 1.11 State's Share in National Agriculture Production and their status 1999-2000

Crop Group	First Position		Second Position		Third Position		Position of M.P. if not in first three	
Crop	State	(%) Share	State	(%) Share	State	(%) Share	Position	(%) Share
Total Cereals	Uttar Pradesh	21.8	Punjab	12.9	Madhya Pradesh	6.5	---	---
Total Pulses	Madhya Pradesh	25.3	Uttar Pradesh	19.5	Maharashtra	16.4	---	---
Total Foodgrains	Uttar Pradesh	21.6	Punjab	12.1	Madhya Pradesh	7.7	---	---
Total Oilseeds	Madhya Pradesh	27.5	Rajasthan	17.2	Maharashtra	12.7	---	---
Rice	West Bengal	15.6	Uttar Pradesh	14.9	Andhra Pradesh	11.7	Thirteenth	2.0
Jowar (kharif)	Maharashtra	52.6	Karnataka	20.9	Andhra Pradesh	6.1	Fourth	6.0
Maize (kharif)	Karnataka	14.7	Bihar	14.0	Andhra Pradesh	12.2	Fifth	11.1
Bajra	Rajasthan	23.0	Maharashtra	20.0	Uttar Pradesh	19.3	Eighth	2.5
Wheat	Uttar Pradesh	34.4	Punjab	21.1	Haryana	12.8	Fourth	11.5
Arhar	Maharashtra	31.2	Uttar Pradesh	19.7	Karnataka & Gujrat	10.4	Fourth	9.7
Gram	Madhya Pradesh	36.8	Uttar Pradesh	15.4	Rajasthan	13.4	---	---
Masoor (Lentil)	Uttar Pradesh	45.7	Madhya Pradesh	26.0	Bihar	14.3	---	---
Groundnut	Tamil Nadu	26.0	Andhra Pradesh	21.1	Karnataka	14.9	Seventh	4.2
Soybean	Madhya Pradesh	70.0	Maharashtra	23.9	Rajasthan	8.8	---	---
Rape/ Mustard	Rajasthan	44.5	Uttar Pradesh	18.3	Madhya Pradesh	10.5	---	---
Cotton	Maharashtra	26.6	Gujarat	18.0	AndhraPradesh	13.8	Eighth	3.6
Sugarcane	Uttar Pradesh	38.6	Maharashtra	17.8	Karnataka	12.2	Tenth	0.6

1.5.14 Productivity of major crops in the State

Among major crops, the important breakthrough in the productivity in wheat and paddy came in the early eighties, although the yield of wheat went on increasing, that of paddy remained almost static. The average yield of paddy was 898 kg./ha. in 1956-57, which increased to 1,059 kg./ha. in 1999-2000, whereas in the case of wheat, it increased from 533 kg./ha. to 1,938 kg./ha. The productivity of maize in the state is satisfactory (1,586 kg./ha.), but it is below the national yield of 1,785 kg./ha.

The present status of productivity of crops of the State although low and static in majority of the crops, the productivity of gram, tur, groundnut and rapeseed mustard is higher than national average (Table 1.12).

Table 1.12 Productivity (Yield) of major crops in Madhya Pradesh

Unit - kg./ ha.

Crops	1956-57	1984-85	1996-97	1999-2000	National average yield
Paddy	898	802	1,167	1,059	1,990
Jowar	668	798	858	784	852
Maize	443	1,379	1,129	1,586	1,785
Wheat	533	1,141	1,879	1,938	2,755
Gram	655	628	914	985	806
Tur	715	817	867	870	797
Urd	NA	271	350	312	---
Moong moth	NA	275	347	322	---
Kulthi	NA	256	303	193	---
Teora	257	269	529	1,106	---
Pea	307	307	407	513	---
Masoor (Lentil)	338	392	480	539	732
Soybean	---	780	946	1,068	1,135
Groundnut	604	532	994	992	774
Rapeseed Mustard	370	687	919	998	982
Linseed	190	221	334	402	728
Cotton (Lint)	124	87	142	147	226
Sugarcane	3,215	4,418	3,913	4,878	7,082
Potato	5,299	12,536	16,954		

When we compare the productivity of major crops of M.P. with the other states (1999-2000), the productivity of jowar is higher than Rajasthan, Andhra Pradesh and Orissa, the productivity of maize in the state is higher than Rajasthan, Maharastra, Gujarat, U.P. and Orissa. The productivity of gram in M.P. is higher than all the states of the country except W. Bengal and Bihar. The productivity of soybean was highest in Maharashtra followed by Rajasthan and M.P. Productivity of groundnut is higher in M.P. than Orissa, A.P., Rajasthan, U.P., Karnataka and Gujarat. The productivity of rapeseed mustard is higher than in all states except Punjab, Haryana, Rajasthan and U.P. (Table 1.13).

Table 1.13 Statewise Productivity of crops, 1999-2000

(Unit - Kg./ Hect.)

Crop	National Average	Madhya Pradesh	Maharastra	Orissa	Andhra Pradesh	Punjab	Haryana	Rajasthan	Tamilnadu	Uttar Pradesh	West Bengal	Chhattisgarh	Bihar	Karnataka	Gujrat
Rice	1990	1059	1682	1128	2687	3346	2386	---	3278	2176	2259	1336	1540	2512	1482
Jowar	859	784	906	---	701	---	---	312	986	872	---	953	---	912	1204
Maize	1785	1586	1490	1483	3182	2574	---	1042	---	1423	1986	1658	2004	2776	1289
Bajra	639	1008	653	---	848	---	991	330	1213	1345	---	---	---	599	918
Wheat	2755	1938	1369	---	---	4696	4167	2540	---	2764	2187	975	2061	---	2116
Gram	806	985	622	500	679	968	580	695	---	948	1111	590	1028	567	512
Arhar	797	870	834	507	360	---	798	---	692	1281	---	1090	1508	581	812
Lentil	732	539	---	---	---	---	---	1516	---	828	823	341	833	---	---
Groundnut	774	992	1049	875	625	---	---	965	1659	844	---	1268	---	715	393
Soybean	1135	1068	1392	---	---	---	---	1221	---	695	---	719	---	---	---
Sesamum	319	230	302	194	208	---	---	74	539	190	854	---	---	510	291
Rape/ Mustard	982	998	---	---	---	1125	1324	1033	---	1020	731	606	955	---	941
Cotton	226	147	191	---	360	286	327	379	506	---	---	---	----	252	315
Sugarcane	70,820	48,780	90,053	65,897	80,638	62,685	55,564	47,712	1,05,757	57,394	75,250	27,880	41,665	1,01,122	69,980

1.5.15 Comparative Growth rates of Production of Important Crops of India and Madhya Pradesh

The growth rates of production during the last 10 years (1990-2000) showed that, the national growth rate of foodgrains production was only 1.49 per cent and 1.64 per cent for oilseeds. On the contrary, the growth rates for the State for the same period was 2.21 per cent for foodgrains and 7.27 per cent for oilseeds. This clearly indicates that the rate of development in the state was higher than the national rate of development. If we look into the crop wise details the same picture prevailed for all major crops. Not only this, same situation was also in the previous decade (1980-1990) (Table 1.14).

Table 1.14 Comparative growth rates of production of major crops of India and Madhya Pradesh

(Unit – Per cent)

Crops	Growth rates (1980- 1990)		Growth rates (1990- 2000)	
	India	Madhya Pradesh	India	Madhya Pradesh
Rice (paddy)	3.31	1.76	1.97	2.24
Wheat	4.27	6.51	2.70	4.28
Maize	2.56	6.34	2.08	1.25
Cereals	3.14	3.49	1.66	1.97
Tur	2.13	3.87	0.86	(-) 2.70
Gram	2.15	6.02	(-) 0.01	3.93
Pulses	2.99	4.73	(-) 0.57	3.10
Foodgrains	3.13	3.79	1.49	2.21
Soybean	19.45	36.82	10.90	9.01
Mustard	7.89	15.15	1.76	2.69
Oilseeds	8.38	19.28	1.64	7.27
Cotton	3.45	4.01	0.64	0.55
Sugarcane	4.33	2.77	2.18	4.72
Total	3.52	5.42	1.51	3.35

Source : Draft Tenth Five Year Plan 2002-2007, Govt. of M.P.

1.5.16 Comparative Performance of Agriculture Sector in Madhya Pradesh

Here, we examine various dimensions of crop production and yield rates in the state with a view to determine the direction and pace of growth of agriculture in future. This understanding will also help in identifying the nature and scope of interventions, which will make noticeable difference to the development of agriculture in the state.

Table 1.15 gives an idea about the comparative performance of agriculture in M.P. vis-a-vis all India and north-west India which was the centre of green revolution technology. The performance of agriculture (crop sector) in the state was dismal up to 1980-83 and the

growth of total output was almost half the all India growth rate and only one third of north-west India. A similar trend was observed in the growth rates of yields during this period. Thus, agriculture of Madhya Pradesh was almost stagnant till 1980s. After 1980-83, the growth of output in the state increased sharply and it was higher than the all India growth rates as well as north west India. In fact, many districts in the state recorded growth of crop output rate above 5 per cent between 1980-83 to 1990-93. Incidentally, this was also the period when incidence of poverty in the state started declining (Table 1.15).

Table 1.15 Comparative performance of agriculture sector in Madhya Pradesh

(Growth rate in percentage)

Particular/ period	Madhya Pradesh	North west India	India
A) Production			
1970- 73 over 1962- 65	1.97	3.6	2.08
1980- 83 over 1970- 73	1.28	3.21	2.38
1992- 95 over 1980- 83	4.71	3.29	3.40
1992- 95 over 1962- 65	2.83	3.35	2.71
B) Yield			
1970- 73 over 1962- 65	1.07	2.6	1.64
1980- 83 over 1970- 73	0.80	2.49	1.80
1992- 95 over 1980- 83	3.75	3.39	3.15
1992- 95 over 1962- 65	2.04	2.88	2.30

Source : Bhalla and Singh (2001), Indian Agriculture : Four Decades of Development, Sage, New Delhi(Tables 2.2 and 2.3)

As far as performance of agricultural production is concerned the compound growth rate of production has been impressive in the case of wheat, soybean, rapeseed mustard and to some extent in the case of gram during the period 1984-85 to 1999-2000.

Despite the impressive performance of agriculture in the state in recent years, agricultural production continues to widely fluctuate from year to year due to vagaries of monsoon and absence of assured irrigation facilities and lack of appropriate technology for dryland agriculture.

1.5.17 Growth Rates of Productivity of Major Crops in Madhya Pradesh

Here, we compare the long term growth rate (1967-68 to 1999-2000) with short term growth rate (1984-85 to 1999-2000). In fact, the short term compound growth rates in yields are relatively more impressive as compared to the long term compound growth rates in all the major crops except soybean for which the productivity improvement in recent years seems to

have slowed down. A comparison of productivity v/s production growth rates indicates that the production has increased faster as compared to productivity, thereby meaning that production increase has come through both the area expansion and the productivity increase rather than productivity alone. It also means that the production increase in these crops has come at the expense of fall in production of some other crops (Table 1.16).

Table 1.16 Compound growth rates of productivity of major crops in Madhya Pradesh

(Productivity in Kg./ha.)

S. No	Crops	Long term growth rates (1967-68 to 1999-2000)			Short term growth rates (1984-85 to 1999-2000)		
		1967-68 Yield	1999-2000 Yield	Growth rate (%)	1984-85 Yield	1999-2000 Yield	Growth rate (%)
1	Rice	805	1,253	1.39	802	1,253	3.02
2	Wheat	737	1,902	3.01	1,141	1,902	3.47
3	Gram	550	909	1.58	628	909	2.50
4	Soybean	426	1,062	2.90	780	1,062	2.08
5	Cotton (Thousand Bales)	219	443	2.23	268	443	3.41

1.5.18 Contribution of Area and Productivity towards Foodgrains Production

In an interesting analysis of growth trends in foodgrains in Madhya Pradesh in three different phases pre-green revolution (1951-52 to 1965-66), green revolution (1966-67 to 1975-76) and post green revolution era (1976-77 to 1998-99) - the growth rates of area, production and productivity during the entire period (1951-52 to 1998-99) were found to be positive and significant. However, during different phases, area and productivity contributed differently to increase in the foodgrains production. The tables reveal that the growth rates of production during pre green revolution era were highly affected by growth rates of area but during the green revolution phase, the growth was due to increase in both area and productivity. The productivity further improved with introduction of HYVs in 1964-65. In the post green revolution era, productivity consistently played the major role in increasing the food grains production in the state as compared to pre-green and green revolution eras. Also the pace of productivity increase has slowed down in recent years and now it seems to be stagnating. In fact, the productivity comparisons of important crops cultivated in M.P. when compared with the national average or other agriculturally progressive states in India reveal that the agriculture in the state is still lagging behind (Table 1.17).

Table 1.17 Contribution of area and productivity of foodgrains production in Madhya Pradesh

S.No.	Era	Contributing factors	
		(1)	(2)
1	Pre green Revolution (1951-52 to 1965-66)	Area	---
2	Green Revolution (1966-67 to 1975-76)	Area	Productivity
3	Post green Revolution (1976-77 to 1998-99)	----	Productivity

1.5.19 Consumption of Fertilizers in Madhya Pradesh

In Madhya Pradesh, the total consumption of fertilizers in 1956-57 was 2.96 thousand tonnes, which rose to 943.70 thousand tonnes in the year 1999-2000. There was a tremendous increase in the consumption of fertilizers i.e. 318 times (Table 1.18).

Table 1.18 Consumption of fertilizer in Madhya Pradesh during different plans

(Unit - '000 tonnes)

Years	N	P	K	Total	NPK Ratio
1956-57	2.35	0.61	---	2.96	4:1:0
	(1)	(1)		(1)	
1960-61	5.14	0.66	---	5.80	8:1:0
	(2.19)	(1.08)		(1.96)	
1965-66	14.58	7.36	---	21.94	2:1:0
	(6.20)	(12.06)		(7.41)	
1973-74	90.40	45.33	9.28	145.01	10:5:1
	(38.47)	(74.31)	(1)	(48.99)	
1978-79	119.03	57.15	13.26	189.44	9:4:1
	(50.65)	(93.69)	(1.43)	(64.00)	
1984-85	223.62	124.69	24.29	372.60	9:5:1
	(95.16)	(204.41)	(2.62)	(125.88)	
1989-90	427.08	295.05	45.39	767.52	9:7:1
	(181.74)	(483.69)	(4.89)	(259.29)	
1996-97	634.80	297.90	40.40	973.10	16:7:1
	(270.13)	(488.36)	(4.35)	(328.75)	
1999-2000	527.20	372.20	44.30	943.70	12:8:1
(New M.P.)	(224.34)	(610.16)	(4.77)	(318.82)	

Figures in parentheses show percentage increase over the base year- 1956-57
Source : Directorate of Agriculture, Govt. of M.P., Bhopal (M.P.)

1.5.20 Consumption of Fertilizers per unit of Cropped area

In the year 1980-81, per hectare consumption of fertilizers in the state was 9.34 kg. It increased to 46.3 kg. per hectare in the year 1999-2000. An increasing trend was observed in the consumption of fertilizers per hectare during 1980-81 to 1999-2000 (Table 1.19).

Table 1.19 Fertilizer consumption (Seasonwise) per unit cropped area (In terms of N.P.K.)

(Unit - Kg./ hect.)

Year	Kharif	Rabi	Average of the year (Kg. Hect.)
1980-81	6.86	13.83	9.34
1981-82	8.51	15.26	10.99
1982-83	8.34	14.76	10.81
1983-84	10.03	20.21	13.55
1984-85	12.85	22.26	16.38
1985-86	15.57	25.29	19.22
1986-87	18.18	28.27	21.90
1987-88	18.02	29.54	22.28
1988-89	23.97	40.28	29.97
1989-90	25.32	38.43	29.87
1990-91	27.36	44.66	34.51
1991-92	31.22	41.82	35.04
1992-93	31.22	39.90	34.35
1993-94	25.58	39.86	31.03
1994-95	32.47	41.39	36.08
1995-96	31.40	35.07	32.84
1996-97	32.83	51.55	40.17
1997-98	38.76	61.70	47.75
1998-99	39.96	58.41	47.77
1999- 2000 (For New M.P.)	32.70	62.40	46.30

Source : Directorate of Agriculture, M.P. Bhopal

1.5.21 Coverage under High Yielding Varieties in M.P.

The area covered under HYVs in M.P. in the year 1969-70 was 425.6 thousand hectares. Of this, the area under paddy was 49 per cent, wheat 36 per cent, jowar 8 per cent, maize 5 per cent and Bajra 2 per cent. The coverage of HYVs increased to 5,372.7 thousand hectares in the year 1999-2000 for new M.P. state. The maximum coverage of HYVs was observed in wheat (62.5 per cent) followed by paddy (17.57 per cent), jowar (9.95 per cent), maize (8.15 per cent) and bajra (1.82 per cent) (Table 1.20).

Table 1.20 Coverage under High Yielding Varieties in Madhya Pradesh

(Unit- '000 Hectares)

Plan Year	Paddy	Jowar	Maize	Bajra	Wheat	Total
1969-70	209.0	34.1	21.3	8.9	152.3	425.6
1974-75	900.0	209.9	50.1	23.3	724.8	1,908.1
1980-81	1,502.8	445.0	125.5	48.9	1,000.0	3,122.2
1984-85	1,751.1	762.4	219.6	88.0	1,598.2	4,409.3
1985-86	1,969.4	1,081.7	342.0	66.0	1,827.1	5,286.2
1986-87	1,962.0	965.0	252.0	51.0	1,700.1	4,930.1
1987-88	1,689.7	961.1	243.2	53.9	1,719.8	4,667.7
1988-89	2,334.7	1,127.7	345.6	68.4	1,928.1	5,804.5
1989-90	2,397.5	1,135.6	337.8	75.4	1,860.4	5,806.7
1990-91	2,798.2	1,189.7	371.7	57.3	2,533.6	6,950.5
1991-92	2,894.0	1,055.0	375.0	72.0	2,173.0	6,570.0
1992-93	3,074.5	985.3	405.1	79.3	2,178.4	6,722.6
1993-94	3,063.5	683.3	399.7	70.4	2,875.0	7,091.9
1994-95	3,157.0	689.4	490.4	89.7	2,970.6	7,397.1
1995-96	3,442.3	814.1	471.2	92.6	2,966.1	7,786.3
1996-97	3,471.2	788.0	508.2	34.2	3,277.4	8,079.0
1997-98	3,592.3	640.9	523.4	93.4	3,484.1	8,334.1
1999-2000 (New M.P.)	944.0	534.6	438.0	98.1	3,358.0	5,372.7

Source : Directorate of Agriculture, M.P.

1.5.22 Consumption of pesticides in Madhya Pradesh

In the year 1990-91, the consumption of pesticides in the state was 2,606 tonnes which got reduced to 982 metric tonnes in 1999-2000. The use of pesticides can be dangerous to human and animal health. The health costs of these pesticides problems when incorporated into the economics of pest control strategies, showed that modern high pesticide use systems suffer from twice lower net returns and higher health costs (Table 1.21).

Table 1.21 Consumption of Pesticides (Technical Grade Material)

(Unit - Tonnes)

Year	Target	Achievement
1990-91	2,840	2,606
1991-92	3,500	2,400
1992-93	2,258	1,494
1993-94	2,520	1,739
1994-95	2,039	1,939
1995-96	1,580	1,208
1996-97	1,052	822
1997-98	1,008	1,149
1998-99	1,211	1,151
1999-2000	1,145	982

Source : Directorate of Agriculture, M.P.

1.5.23 Farm Machinery and Implements in Madhya Pradesh

There were 0.28 thousand diesel pumps and 5.46 thousand electric pumps in Madhya Pradesh in the year 1956-57. The number of diesel pumps and electric pumps increased to 191.02 thousand and 971.58 thousand respectively in the year 1999-2000. The tractors numbered 1.31 thousand in the year 1956-57 and rose to 186.40 thousand in 1999-2000. Similarly, there were 4,409 thousand ploughs (wooden + iron) in the year 1956-57. In 1999-2000, the number of plough in the state was 3,829 thousand. The number of bullock carts in the state during both periods was more or less same (Table 1.22).

Table 1.22 Agricultural Machinery and Implements in Madhya Pradesh (during different plans**)**

(Unit- '000 Nos.)

Year	Ploughs		Bullock carts	Sugarcane Crushers		Pumps		Tractors
	Wooden	Iron		Power Driven	Bullock Driven	Diesel pumps	Electric pumps	
1956-57	4,379.00	30.00	NA	0.37	16.32	0.28	5.46	1.31
1960-61	4,697.40	54.90	1,954.10	0.65	16.06	9.68	2.22	2.02
1965-66	4,529.46	69.82	2,071.58	0.93	18.93	19.70	6.11	2.51
1973-74	4,623.97	106.13	2,240.09	2.69	19.33	60.13	81.27	7.78
1978-79	4,867.43	207.48	2,340.11	8.45	21.48	114.64	203.75	18.46
1984-85	5,373.38	223.35	2,421.79	7.18	18.50	152.64	337.45	33.76
1989-90	5,582.07	303.06	2,467.59	10.58	20.01	171.63	531.25	63.88
1996-97	5,458.07	488.00	2,427.38	8.39	18.40	171.22	985.11	130.97
1999-2000 (New M.P.)	3,345.00	484.00	2,119.18	7.80	6.70	191.02	971.58	186.40

Source : Commissioner of Land Records, M.P.

1.5.24 Horticultural Crops in Madhya Pradesh

Horticultural crops include fruits, vegetables, spices, flowers, and medicinal & aromatic plants. In the year 1982-83, the area under fruits, vegetables and spices was 56,679 hectares, 1,23,269 hectares and 1,34,158 hectares respectively and production was 9.04 lakh tonnes, 16.61 lakh tonnes and 0.62 lakh tonnes respectively. Similarly in the year 1999-2000 the area under fruits, vegetables, spices, flowers and medicinal and aromatic plants was 57,485 hectares, 2,23,840 hectares 2,93,232 hectares 3,425 hectares and 20,825 hectares respectively. The figures for production of these crops were 15.77 lakh tonnes, 34.70 lakh tonnes, 2.70 lakh tonnes, 0.002 lakh tonnes and 1.24 lakh tonnes respectively. Thus a significant increase was observed in the area and production of these crop groups during 1982-83 to 1999-2000 (Table 1.23).

Table 1.23 Area and Production of Horticultural Crops in Madhya Pradesh

Area - Hectares
Production - Lakh tonnes

Years	Fruits		Vegetables		Spices		Flowers		Medicinal Plants	
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
1982-83	56,679	9.04	1,23,269	16.61	1,34,158	0.62	---	---	---	---
1985-86	52,175	9.69	1,31,322	16.80	1,42,980	0.70	---	---	---	---
1991-92	61,313	11.59	1,58,909	19.52	1,98,538	1.75	964	0.0057	---	---
1995-96	59,709	11.23	1,89,081	23.27	2,49,858	2.46	1,388	0.0083	23,328	1.40
1999-2000*	57,485	15.77	2,23,840	34.70	2,93,232	2.70	3,425	0.002	20,825	1.24

Source : Directorate of Horticulture, M.P. **** Data for new M.P..***

The major fruits, vegetables, spices, flowers and medicinal plants producing districts of Madhya Pradesh are shown in table 1.24.

Table 1.24 Horticultural Crops and major producing districts of Madhya Pradesh

Name of crop			Major producing districts of M.P.
1. Fruits	1	Mango	Rewa, Jabalpur, Satna, Umaria, Shahdol, Katni
	2	Orange	Chhindwara, Mandsaur, Shajapur, Rajgarh, Betul
	3	Mosambi	Hoshangabad, Khargone, Dhar, Shajapur
	4	Lime	Hoshangabad, Khandwa, Khargone, Ujjain, Dhar
	5	Banana	Khandwa, Khargone, Dhar, Raigarh
	6	Guava	Hoshangabad, Khargone, Badwani, Dhar
	7	Papaya	Dhar, Khandwa, Ratlam, Khargone, Hoshangabad
	8	Grapes	Guna, Mandsaur, Ratlam, Indore, Khandwa
2. Vegetable	1	Potato	Indore, Dewas, Shajapur, Ujjain
	2	Sweet Potato	Surguja, Chhatarpur, Hoshangabad, Tikamgarh
	3	Onion	Khandwa, Shajapur, Ratlam, Sagar, Indore
	4	Tomato	Bhopal, Datia, Indore, Chhatarpur, Sagar, Satna
	5	Brinjal	Sagar, Jabalpur, Hoshangabad, Bhopal, Khandwa
	6	Cabbage	Indore, Betul, Chhindwara, Hoshangabad, Ujjain
	7	Cauliflower	Chhindwara, Indore, Betul, Hoshangabad,
	8	Okra	Balaghat, Shahdol, Jhabua, Hoshangabad, Ratlam
	9	Pea	Ujjain, Indore, Ratlam, Hoshangabad
3. Spices	1	Chillies	Khargone, Dhar, Khandwa, Indore, Betul,
	2	Ginger	Tikamgarh, Chhindwara, Khargone, Dewas
	3	Turmeric	Tikamgarh, Khargone, Badwani
	4	Garlic	Mandsaur, Ratlam, Indore, Ujjain, Dewas
	5	Coriander	Guna, Mandsaur, Shajapur, Rajgarh, Vidisha
4 Flowers			Ujjain, Indore, Sehore, Ratlam, Dewas
5 Medicinal plants			Ujjain, Ratlam, Mandsaur, Shivpuri, Khargone

Source : National Horticulture Board, Spices Board, Commissioner Land Record.

1.5.25 Livestock

The total livestock excluding poultry in the state numbered 3,22,13,993 in 1999-2000. In 1989-90, the number was 4,32,81,800. It comprised mainly of cattle (62.24 per cent), buffaloes (16.78 per cent) and goat (17.09 per cent). In 1999-2000 the cattle and buffaloes together comprised 76.68 per cent of the total livestock. The percentage of "other livestock" was 23.32. The number of poultry birds was 84,23,600 in 1989-90 and 84,80,548 in 1999-2000 (Table 1.25).

Table 1.25 Livestock and Poultry in Madhya Pradesh

(In number)

S. No.	Particulars	1989-90	Percentage	1999-2000 (For New M.P.)	Percentage
1	Cattle	2,69,39,300	62.24	1,83,15,030	56.85
2	Buffaloes	72,62,000	16.78	63,87,418	19.83
3	Sheep	9,12,200	2.11	N.A.	N.A.
4	Goat	73,98,400	17.09	N.A.	N.A.
5	Horses and Pony	96,600	0.22	N.A.	N.A.
6	Pigs	6,00,700	1.39	N.A.	N.A.
7	Other livestock	72,600	0.17	75,11,545	23.32
8	Total livestock	4,32,81,800	100.00	3,22,13,993	100.00
9	Poultry	84,23,600	---	84,80,548	---

Source : Commissioner, Land Records, M.P.

1.5.26 Agricultural Development Initiatives in Madhya Pradesh

After India became independent in 1947, several programmes for improving its agriculture such as the Grow More Food Campaign, the Community Development Programme, and the National Extension Service Programme were implemented in the state. During the year 1956-57, the state faced the first post- independence shortage of food supplies and agricultural raw material for industries.

During the early sixties, concerted efforts were made in specific areas for exploiting the available resources for agricultural development of the state. Based on the recommendations of a Ford Foundation Team, an innovative programme called the Intensive Agriculture District Programme (IADP) popularly known as Package Programme was initiated in 1960-61 in Raipur district of the state. The main objective of the IADP was to achieve rapid increases in food production through intensive use of modern inputs, and agricultural techniques and by providing sufficient production incentives to the farmers. Based on the encouraging experience of IADP in Raipur district, a diluted version of IADP called "Intensive Agriculture Area Programme (IAAP) was introduced in a few more districts of the state. IAAP also yielded good results.

The introduction of high yielding varieties in the year 1964 provided a fillip to foodgrains production in the state. This resulted in the following notable developments.

i) Development of suitable production technology and adoption of package approach for different crops.

ii) Intensification of research for developing high yielding strains; and,

iii) Creation of basic infrastructure to support production programmes.

Consequently, the state could march ahead on the path of self-sufficiency, particularly in foodgrains. The foodgrains production increased from 8.9 million tonnes in 1964-65 to 10.8 million tonnes in 1970-71 and it reached 16 million tonnes level in 2000-2001 after the carving out of the new state of Chhattisgarh from the state. The soybean production during the seventies was only 1,970 metric tonnes but it increased to 2 million metric tonnes in the eighties. It had touched 5 million metric tonnes level in 2000-2001. As the foremost producer of oilseeds, Madhya Pradesh accounts for 82 per cent of India's total soybean production and is the third largest producer of foodgrains. The state has a wealth of raw material and 20 per cent of India's forest resources.

The introduction of soybean in the state during the eighties boosted the oilseeds production and thereby improved the economic condition of soybean growers, as it fetched them high prices relative to its cost of production.

The state agriculture department has recently taken quite a few initiatives to speed up the pace of agricultural development in the state. For example, a time-bound Action Plan has been put into place for increasing the productivity levels of paddy in eastern M.P. and an Action Plan for encouraging organic farming has been drawn up and is being implemented in selected areas of the state. Besides, two externally aided projects, namely, "Women in Agriculture" and Waste Land Development are being implemented in the state. Further more, the Govt. of India guidelines for implementing the National Watershed Development Programme for Rainfed Areas (NWDPRA) have been thoroughly revised to allow total community participation in decision making for planning and execution.

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CHAPTER – II

AGRICULTURAL DEVELOPMENT SCENARIO OF THE STATE IN THE FIVE YEAR PLANS

Over the last fifty years planning for economic and social development has been an integral exercise. This is manifested in the formulation of five year plans. The transition from a traditional and subsistence economy of the fifties to a modern and industrial economy of the nineties has largely been the outcome of plan exercise spanning a total of nine five year plans and a few annual plans.

Planning has more substance than a mere allocation of resources among competing uses. Planning prescribes a direction towards which the economy is sought to be moved with a view to attaining pre-determined goals and objectives. And given the federal character of our polity, it is the combined effort of both Union and State Governments towards achieving plan objectives that is given shape in the exercise of five year plans.

The (erstwhile) State of Madhya Pradesh was formed on 1st November, 1956. At the time of formation of the State, it had 43 districts.

2.1 Five Year Plans of the State

1. Second Five Year Plan (1956-61)
2. Third Five Year Plan (1961-66)
3. Annual Plans - (1966-67)
   (1967-68)
   (1968-69)
4. Fourth Five Year Plan (1969-74)
5. Fifth Five Year Plan (1974-79)
6. Annual Plan - (1979-80)
7. Sixth Five Year Plan (1980-85)
8. Seventh Five Year Plan (1985-90)
9. Annual Plan (1990-91)
   (1991-92)
10. Eighth Five Year Plan (1992-97)
11. Ninth Five Year Plan (1997-2002)
12. Tenth Five Year Plan (2002-2007)
    Annual Plan (2002-2003)

2.2 Second Five Year Plan (1956-61)

The outlay envisaged for production sector in the second five year plan was Rs.138.53 crores, against which the expenditure incurred was Rs.111.26 crores. In Social Services Sector, the outlay was Rs.52.37 crores and expenditure was Rs.37.66 crores. In both the sectors, the expenditure was less than the outlay. The total outlay and expenditure of the second plan was Rs.190.90 crores and Rs.148.92 crores respectively. Of the total outlay of the plan, 72.57 per cent was for production sector and 27.43 per cent for Social Services Sector. Similarly of the total expenditure, 74.71 per cent was for production sector and 25.29 per cent for social services sector. Major emphasis was laid on production sector. In production sector, priority was given to irrigation and power followed by agriculture and community development, transport and communication and industry and mining. In social services sector, priority was given to education, followed by health, other social services, housing and other miscellaneous sectors. The outlay envisaged for agriculture and community development was Rs.50.49 crores, i.e. 26.45 per cent of the total outlay of the plan. Similarly, the expenditure incurred on this sector was 27.91 per cent of the total expenditure of the plan. In social services sectors major emphasis was laid on education and health. The percentage of expenditure to outlay was 78.01.The percentage was higher (80.31) for production sector than the social services sector (71.91). This shows that proportionate expenditure on production sector was higher than social services sector indicating the priority

Table 2.1 Second Five Year Plan (1956-61) Outlay and Expenditure

(Rs. in crore)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	50.49	26.45	41.56	27.91	82.31
2	Irrigation and Power	64.79	33.94	56.92	38.22	87.85
3	Industry and Mining	10.35	5.42	3.89	2.61	37.58
4	Transport & Communication	12.90	6.76	8.89	5.97	68.91
	TOTAL A =	138.53	72.57	111.26	74.71	80.31
B	**Social Services Sector**					
1	Education	21.74	11.39	14.74	9.90	67.80
2	Health	14.46	7.57	9.59	6.44	66.32
3	Housing	4.50	2.35	2.85	1.91	63.33
4	Other Social Services	8.26	4.33	3.28	2.20	39.71
5	Miscellaneous	3.41	1.79	7.20	4.84	211.14
	TOTAL B =	52.37	27.43	37.66	25.29	71.91
	TOTAL A+B =	190.90	100.00	148.92	100.00	78.01

accorded by the implementing authorities to production sector. Among the sub heads of the production sector irrigation and power received highest priority (87.85 per cent of the allotment made for that sector was utilised or spent). The lowest proportion of expenditure to allotment (37.58) was for industry and mining sub head. Among the sub heads of social services sector the proportion of expenditure to outlay varied between 63.33 to 67.80 per cent for housing, health and education (Table 2.1).

2.3 Third Five Year Plan (1961-66)

In the state's third five year plan (1961-66), high priority was accorded to irrigation and power sector followed by agriculture and community development, education, health, transport and communication and industry. Of the total outlay (Rs.300 crores) of the third plan, 39.27 per cent was for irrigation and power followed by agriculture and community development (25.48 per cent), education (10.66 per cent), health (7.10 per cent), transport (5.94 per cent) and industry (3.50 per cent). In the case of expenditure, it was highest for irrigation and power (43.97 per cent) followed by agriculture and community development, (24.69 per cent), education (9.50 per cent), health (7.51 per cent) and transport (5.39 per cent). Of the total outlay, the share of production sector was 74.19 per cent and social services sector 25.81 per cent. Of the total expenditure of Rs.286.69 crores, the expenditure made on production sector was 76.86 per cent and social services sector 23.14 per cent. In the third five year plan the outlay increased to Rs.300.00 crores or 57.15 per cent higher than the second five year plan of Rs.190.90 crores. The actual expenditure increased to Rs.286.69 crores or 92.51 per cent higher than the second five year plan of Rs.148.92 crores.

The proportions of outlay for different sub head was similar in 2nd and 3rd five year plans. In both the plans irrigation and power received the highest priority followed by sub head "agriculture and community development". The third important sub head in both the plans was education.

As regards, implementation of the programmes (in terms of proportion of expenditure to outlay) it was noted that in the third five year plan the expenditure formed 95.56 per cent of the outlay. The percentage was nearly 100 (99.01) in the case of production sector against

85.65 per cent in social services sector. In production sector in irrigation and power the actual expenditure exceeded the outlay by about 7 per cent. This shows the priority attached to this sub head by the implementing authorities. In the case another sub head viz. agriculture and community development the proportion of expenditure to outlay was second highest (92.60). Incidentally this sub head received second highest priority in the previous plan also. The sub head with lowest priority was industry and mining (76.67 per cent) similar to that in previous plan (Table 2.2).

Table 2.2 Third Five Year Plan (1961-66) Outlay and Expenditure

(Rs. in crores)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	76.45	25.48	70.79	24.69	92.60
2	Irrigation and Power	117.80	39.27	126.07	43.97	107.02
3	Industry and Mining	10.50	3.50	8.05	2.81	76.67
4	Transport & Communication	17.80	5.94	15.44	5.39	86.74
	TOTAL A =	222.55	74.19	220.35	76.86	99.01
B	**Social Services Sector**					
1	Education	31.98	10.66	27.24	9.50	85.18
2	Health	21.30	7.10	21.54	7.51	101.27
3	Housing	5.50	1.83	3.05	1.06	55.45
4	Other Social Services	9.90	3.30	7.70	2.69	77.78
5	Miscellaneous	8.77	2.92	6.81	2.38	77.65
	TOTAL B =	77.45	25.81	66.34	23.14	85.65
	TOTAL A+B =	300.00	100.00	286.69	100.00	95.56

2.4 Three Annual Plans (1966-67, 1967-68 and 1968-69)

In between third and fourth five year plans, there were three annual plans. The total outlays for the three annual plans was Rs.178.82 crores, of which 81.37 per cent was for production sector and 18.63 per cent was for social services sector. In these three annual plans highest outlay (40.11 per cent) was for irrigation and power followed by agriculture and community development (30.80 per cent), transport and communication (7.04 per cent), health (6.97 per cent), and education (6.46 per cent). The actual expenditure in these three annual plans was Rs.167.79 crores. The expenditure in production sector was 83.22 per cent and in social services sector 16.78 per cent. Of the total expenditure, highest was for irrigation and power (41.27 per cent) followed by agriculture and community development

(30.95 per cent), transport and communication (7.93 per cent), health (7.17 per cent) and education (4.70 per cent).

In these three annual plans also, the highest priority was given to irrigation and power and agriculture and community development (Table 2.3).

Table 2.3 Three Annual Plan (1966-67, 1967-68 and 1968-69) Outlay and Expenditure

(Rs. in crore)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	55.08	30.80	51.93	30.95	94.28
2	Irrigation and Power	71.73	40.11	69.25	41.27	96.54
3	Industry and Mining	6.11	3.42	5.16	3.07	84.45
4	Transport & Communication	12.59	7.04	13.30	7.93	105.64
	TOTAL A =	145.51	81.37	139.64	83.22	95.96
B	**Social Services Sector**					
1	Education	11.55	6.46	7.88	4.70	68.22
2	Health	12.47	6.97	12.03	7.17	96.47
3	Housing	1.07	0.60	0.95	0.56	88.78
4	Other Social Services	4.93	2.76	4.52	2.70	91.68
5	Miscellaneous	3.29	1.84	2.77	1.65	84.19
	TOTAL B =	33.31	18.63	28.15	16.78	84.51
	TOTAL A+B =	178.82	100.00	167.79	100.00	93.83

2.5 Fourth Five year plan (1969-74)

In the fourth five year plan, the total outlay and expenditure was Rs.455.28 crores and Rs.481.12 crores respectively. In this plan the actual expenditure was more than the total outlay. Of the total outlay, 78.98 per cent was for production sector and 21.02 per cent for social services sector. The outlay envisaged for the agriculture and community development sector was Rs.127.43 crores (27.99 per cent of the total outlay), against which the actual expenditure incurred was Rs.124.94 crores (i.e.25.97 per cent of the total expenditure). In irrigation and power sector, the total outlay was Rs.183.17 crores, against which the actual expenditure was more (Rs.212.45 crores). Of the total expenditure incurred in fourth plan, 80.98 per cent was on production sector and the remaining 19.02 per cent on social services sector. In fourth plan, the outlays increased to Rs.455.28 crores or 51.76 per cent higher than the third plan of Rs.300.00 crores. The actual expenditure increased to Rs.481.12 crores or 67.82 per cent higher than the third five year plan of Rs.286.69 crores.

The percentage of expenditure to outlay was 105.67. The percentage was higher (108.35) for production sector than the social services sector (95.62). This showed that proportionate expenditure on production sector was higher than the social services sector indicating the priority accorded by the implementing authorities to production sector. Among the sub-heads of the production sector irrigation and power received highest priority as 115.98 per cent of the total allotment received for that sector was utilized or spent. The lowest proportion of expenditure to allotment (76.66) was for industry and mining sub head. The proportion of expenditure over outlays was more in the case of sub head irrigation and power, transport and communication, education, and housing (Table 2.4).

Table 2.4 Fourth Five Year Plan (1969- 74) Outlay and Expenditure

(Rs. in crore)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	127.43	27.99	124.94	25.97	98.04
2	Irrigation and Power	183.17	40.23	212.45	44.15	115.98
3	Industry and Mining	15.30	3.36	11.73	2.44	76.66
4	Transport & Communication	33.70	7.40	40.51	8.42	120.21
	TOTAL A =	359.60	78.98	389.63	80.98	108.35
B	**Social Services Sector**					
1	Education	24.95	5.48	25.53	5.31	102.32
2	Health	30.60	6.72	30.36	6.31	99.21
3	Housing	9.00	1.98	9.18	1.91	102.00
4	Other Social Services	19.79	4.35	16.11	3.35	81.40
5	Miscellaneous	11.34	2.49	10.31	2.14	90.92
	TOTAL B =	95.68	21.02	91.49	19.02	95.62
	TOTAL A+B =	**455.28**	**100.00**	**481.12**	**100.00**	**105.67**

2.6 Fifth Five Year Plan (1974-79)

In the fifth five year plan, the state government proposed greater emphasis on irrigation and power followed by agriculture and community development, transport and communication, health and education. The approved outlay for the fifth plan was Rs.1,379.79 crores, against which the actual expenditure was Rs.1,437.39 crores. Of the total outlay 83.98 per cent was for production sector and 16.02 per cent for social services sector. In the production sector, highest priority was given to irrigation and power sub sector. Of the total expenditure, 66.42 per cent was incurred on irrigation and power sector followed by agriculture and community development sector (11.25 per cent).

In the fifth five year plan, the total outlay increased to Rs.1,379.79 crores or 203.06 per cent higher than the fourth five year plan of Rs.455.28 crores. Similarly, the actual expenditure increased to Rs.1,437.39 crores or 198.76 per cent higher than the fourth plan of Rs.481.12 crores. Of the total expenditure made in the fifth plan, 85.72 per cent was for production sector and 14.28 per cent was for social services sector. Thus the priority was given to production sector over social services sectors. As regards implementation of programmes in terms of proportion of expenditure to outlay, it was observed that the expenditure formed 104.17 per cent of the outlay. The percentage was 106.34 in the case of production sector against 92.82 per cent in social services sector.

In production sector, in the case of transport and communication the expenditure exceeded the outlay by 44.99 per cent. In irrigation and power sub sector, the expenditure exceeded the outlay by 15.08 per cent. In social services sector, the actual expenditure exceeded the outlay by about 16.69 per cent in the case of health. Health was given highest priority followed by education and housing (Table 2.5).

Table 2.5 Fifth Five Year Plan (1974-79) Outlay and Expenditure

(Rs. in crore)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	240.66	17.44	161.71	11.25	67.19
2	Irrigation and Power	829.58	60.12	954.71	66.42	115.08
3	Industry and Mining	26.56	1.93	26.02	1.81	97.97
4	Transport & Communication	61.88	4.49	89.72	6.24	144.99
	TOTAL A =	1,158.68	83.98	1,232.16	85.72	106.34
B	**Social Services Sector**					
1	Education	40.04	2.90	32.48	2.26	81.12
2	Health	77.39	5.61	90.31	6.28	116.69
3	Housing	36.40	2.64	25.71	1.79	70.63
4	Other Social Services	34.38	2.49	32.87	2.29	95.61
5	Miscellaneous	32.90	2.38	23.86	1.66	72.52
	TOTAL B =	221.11	16.02	205.23	14.28	92.82
	TOTAL A+B =	1,379.79	100.00	1,437.39	100.00	104.17

2.7 Annual Plan (1979-80)

After fifth five year plan, there was an annual plan 1979-80. The total outlay and expenditure for this plan was Rs.379.40 crores and Rs.514.83 crores respectively. In this plan

also the expenditure was more than the outlay. Of the total outlay, 86.64 per cent was for production sector and 13.36 per cent for social services sector. The highest amount (61.72 per cent) was allotted to irrigation and power sector followed by agriculture and community development (17.01 per cent). The similar trend was observed in the case of expenditure (Table 2.6).

Table 2.6 Annual Plan (1979- 80) Outlay and Expenditure

(Rs. in crore)

S. No.	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
A	**Production Sector**					
1	Agriculture and Community Development	64.55	17.01	107.07	20.80	165.87
2	Irrigation and Power	234.17	61.72	315.43	61.27	134.70
3	Industry and Mining	6.89	1.82	7.74	1.50	112.34
4	Transport & Communication	23.09	6.09	28.62	5.56	123.95
	TOTAL A =	328.70	86.64	458.86	89.13	139.60
B	**Social Services Sector**					
1	Education	9.70	2.56	7.22	1.40	74.43
2	Health	4.62	1.22	15.54	3.02	336.36
3	Housing	6.05	1.59	4.20	0.82	69.42
4	Other Social Services	29.97	7.90	28.68	5.57	95.69
5	Miscellaneous	0.36	0.09	0.33	0.06	91.67
	TOTAL B =	50.70	13.36	55.97	10.87	110.39
	TOTAL A+B =	379.40	100.00	514.83	100.00	135.69

2.8 Sixth Five Year Plan (1980-85)

In sixth five year plan, there was only 10 heads of development. There were no sub-heads like production sector and social services sector. In the State's Sixth Plan, the total outlay was Rs.3,800 crores and expenditure was Rs.3,872.27 crores. In this plan also, the expenditure was more than the outlays. Of the total outlays, highest was for energy (39.47 per cent), followed by irrigation and flood control (28.40 per cent), social services (13.16 per cent), agriculture and allied services (7.88 per cent), rural development (4.87 per cent) and transport (4.14 per cent) respectively. Of the total expenditure, highest expenditure was made on energy (35.22 per cent) followed by irrigation and flood control (25.07 per cent), social services (16.25 per cent), agriculture and allied services (10.22 per cent) and transport and rural development (5.02 per cent each) respectively.

In the sixth five year plan, the percentage of expenditure to outlay was 101.90. The percentage was highest (163.69) for industry and mining sub-sector followed by agriculture and allied services (132.29), social services (125.80), transport (123.20) and rural development (105.03). In these sub sectors, the expenditure was more than the outlay. In this plan, the total outlay increased to Rs.3,800.00 crores or 175.40 per cent higher than the fifth plan outlay of Rs.1,379.79 crores. Also the actual expenditure increased to Rs.3,872.27 crores or 169.39 per cent higher than the fifth plan expenditure of Rs.1,437.39 crores (Table 2.7).

Table 2.7 Sixth Five Year Plan (1980- 85) Outlay and Expenditure

(Rs. in crore)

S. No	Head/ Sub-Head of Development	Outlay	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
1	Agriculture and Allied Services	299.30	7.88	395.95	10.22	132.29
2	Rural Development	185.00	4.87	194.30	5.02	105.03
3	Irrigation and Flood Control	1,079.10	28.40	970.87	25.07	89.97
4	Energy	1,500.00	39.47	1,364.00	35.22	90.93
5	Industry & Mining	68.95	1.81	112.87	2.91	163.69
6	Transport	157.50	4.14	194.04	5.02	123.20
7	Science, Technology and Environment	---	---	0.64	0.02	---
8	General Economic Services	8.55	0.23	9.01	0.23	105.38
9	Social Services	500.13	13.16	629.15	16.25	125.80
10	Other General Services	1.47	0.04	1.44	0.04	97.96
	Total	**3,800.00**	**100.00**	**3,872.27**	**100.00**	**101.90**

2.9 Seventh Five Year Plan (1985-90)

The state's seventh five year plan outlay was Rs.7,000 crores, against which the expenditure was Rs.6,591.18 crores. The expenditure is less than the outlay. In this plan, highest priority was given to irrigation and flood control but the expenditure was highest for energy sector. Of the total outlay, 35.36 per cent was for irrigation and flood control, 29.61 per cent for energy, 14.78 per cent for social services, 7.51 per cent for agriculture and allied services, 4.89 per cent for transport and 4.29 per cent for rural development. In this plan, the maximum expenditure was on energy (30.06 per cent) followed by irrigation and flood control (26.23 per cent), social services (20.77 per cent), agriculture and allied services (8.30 per cent), rural development (5.22 per cent) and transport (4.55 per cent).

In seventh five year plans, the total outlay was Rs.7,000.00 crores, which was 84.21 per cent more than the outlay for sixth plan of Rs.3,800.00 crores. The total expenditure on this plan was Rs.6,591.18 crores, which was 70.21 per cent higher than the expenditure of previous plan of Rs.3,872.27 crores. The percentage of expenditure to outlay was 94.16. The percentage was 103.96 for agriculture and allied services and 114.68 for rural development. Of the total expenditure of the plan, the highest expenditure was on energy (30.06 per cent) followed by irrigation and flood control (26.23 per cent), social services (20.77 per cent), agriculture and allied services (8.30 per cent) and rural development (5.22 per cent) (Table 2.8).

Table 2.8 Seventh Five Year Plan (1985-90) Outlay and Expenditure

(Rs. in crore)

S. No	Head/ Sub-Head of Development	Outlay	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
1	Agriculture and Allied Services	526.03	7.51	546.88	8.30	103.96
2	Rural Development	300.11	4.29	344.16	5.22	114.68
3	Irrigation and Flood Control	2,474.88	35.36	1,729.19	26.23	69.87
4	Energy	2,073.00	29.61	1,981.08	30.06	95.56
5	Industry & Mining	205.82	2.94	238.86	3.62	116.05
6	Transport	342.39	4.89	299.53	4.55	87.48
7	Science, Technology and Environment	23.34	0.33	22.56	0.34	96.66
8	General Economic Services	17.20	0.25	58.10	0.88	337.79
9	Social Services	1,034.75	14.78	1,369.10	20.77	132.31
10	Other General Services	2.48	0.04	1.72	0.03	69.35
	Total	**7,000.00**	**100.00**	**6,591.18**	**100.00**	**94.16**

2.10 Annual Plans (1990-91)

The total outlay for the State's Annual Plan for 1990-91 was Rs.2,000 crores and the actual expenditure was Rs.1,703.52 crores. In this plan, the expenditure was less than the total outlay of the state. Of the total outlay 7.56 per cent was towards agricultural and allied services. The highest share of outlay (31.41 per cent) was for energy followed by irrigation and flood control (22.68 per cent) and social services (22.03 per cent). Of the total expenditures, 7.19 per cent was for agriculture and allied services. The expenditure on energy was 32.09 per cent followed by irrigation and flood control (22.32 per cent) and social services (22.24 per cent) (Table 2.9).

Table 2.9 Annual Plan (1990 -91) Outlay and Expenditure

(Rs. in crore)

S. No	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
1	Agriculture and Allied Services	151.20	7.56	122.49	7.19	81.01
2	Rural Development	105.64	5.28	107.38	6.30	101.65
3	Irrigation and Flood Control	453.60	22.68	380.25	22.32	83.83
4	Energy	628.13	31.41	546.60	32.09	87.02
5	Industry & Mining	81.66	4.08	55.09	3.23	67.46
6	Transport	67.99	3.40	57.34	3.37	84.33
7	Science, Technology and Environment	6.95	0.35	5.64	0.33	81.15
8	General Economic Services	63.60	3.18	49.51	2.91	77.84
9	Social Services	440.50	22.03	378.87	22.24	86.01
10	Other General Services	0.73	0.03	0.35	0.02	47.94
	Total	**2000.00**	**100.00**	**1,703.52**	**100.00**	**85.18**

2.11 Annual Plan (1991-92)

The total outlay for the annual plan 1991-92 was Rs.2,426.00 crores, which was more than the outlays of the annual plan of 1990-91. In the case of expenditure of the annual plan of 1991-92 (Rs.1,821.86 crores) it was found to be higher than the annual plan 1990-91. In this annual plan the outlay for agriculture and allied services was 8.31 per cent. The proportion of outlay was highest (31.43 per cent) on energy followed by irrigation and flood control (23.73 per cent) and social services (21.17 per cent). The lowest outlay (0.32 per cent) was for science, technology and environment. Of the total expenditure, 7.88 per cent was for agriculture and allied services. It was highest in the case of energy (30.56 per cent) followed by irrigation and flood control (23.63 per cent) and social services (20.93 per cent) and lowest in the case of science, technology and environment (0.34 per cent) (Table 2.10).

2.12 Eighth Five Year Plan (1992-1997)

Of the total outlay of eighth five year plan, 32.25 per cent was for energy sector followed by irrigation and flood control (23.93 per cent), social services (18.73 per cent), agriculture and allied services (7.07 per cent), rural development (4.74 per cent), industry & mining (4.20 per cent), transport (3.87 per cent). It was lowest in the case of science,

Table 2.10 Annual Plan (1991 - 92) Outlay and Expenditure

(Rs. in crore)

S. No	Head/ Sub-Head of Development	Outlays	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
1	Agriculture and Allied Services	201.72	8.31	143.61	7.88	71.19
2	Rural Development	120.59	4.97	106.55	5.85	88.36
3	Irrigation and Flood Control	575.72	23.73	430.43	23.63	74.76
4	Energy	762.52	31.43	556.77	30.56	73.02
5	Industry & Mining	93.32	3.85	60.36	3.31	64.68
6	Transport	74.44	3.07	68.53	3.76	92.06
7	Science, Technology and Environment	7.85	0.32	6.20	0.34	78.98
8	General Economic Services	69.56	2.87	67.69	3.72	97.31
9	Social Services	513.61	21.17	381.34	20.93	74.25
10	Other General Services	6.67	0.28	0.38	0.02	5.69
	Total	**2,426.00**	**100.00**	**1,821.86**	**100.00**	**75.10**

technology and environment (0.28 per cent). In the case of actual expenditure (at current prices), highest (30.69 per cent) expenditure was towards energy sector followed by social services sector (25.59 per cent), irrigation and flood control sector (18.51 per cent), rural development (9.65 per cent) and agriculture and allied services (7.07 per cent). In this plan too total actual expenditure was more than the outlay of the plan.

The total outlay of the eighth five year plan was Rs.11,100.00 crores, which was 58.57 per cent more than the total outlay of seventh plan (Rs.7,000 crores). Similarly, the total expenditure (Rs.12,252.21 crores) of the plan was 85.89 per cent more than the expenditure of seventh plan (Rs.6,591.18 crores. The percentage of expenditure to outlay was highest (224.64)in rural development followed by science, technology and environment (163.38), social services (150.81), agriculture and allied services (110.37) and energy (105.04 per cent). In these heads, the expenditure was more than the outlays (Table 2.11).

Table 2.11 Eighth Five Year Plan (1992- 97) Outlay and Expenditure

(Rs. in crore)

S. No	Head/ Sub-Head of Development	Outlay	Percentage to total outlay	Actual Expenditure (At Current Prices)	Percentage to total expenditure	Percentage of expenditure to outlay
1	Agriculture and Allied Services	784.97	7.07	866.38	7.07	110.37
2	Rural Development	526.64	4.74	1,183.04	9.65	224.14
3	Irrigation and Flood Control	2,656.60	23.93	2,267.41	18.51	85.35
4	Energy	3,579.21	32.25	3,759.62	30.69	105.04
5	Industry & Mining	465.79	4.20	302.64	2.47	64.97
6	Transport	429.32	3.87	314.49	2.57	73.25
7	Science, Technology and Environment	31.16	0.28	50.91	0.41	163.38
8	General Economic Services	462.44	4.17	340.54	2.78	73.64
9	Social Services	2,079.27	18.73	3,135.74	25.59	150.81
10	Other General Services	84.60	0.76	31.44	0.26	37.16
	Total	**11,100.00**	**100.00**	**12,252.21**	**100.00**	**110.38**

2.13 Ninth Five Year Plan (1997-2002)

The total outlay for the ninth five year plan (1997-2002) was Rs.20,075 crores. Of which highest (42.37 per cent) portion was towards social services sector. The next important sector was energy sector (17.33 per cent) followed by irrigation and flood control sector (13.56 per cent), rural development (9.99 per cent), agriculture and allied sector (5.63 per cent), industry and mining sector (5.55 per cent) and transport (2.80 per cent). The total actual expenditure for the first three years of plan (1997-98 to 1999-2000) was Rs.10,309.94 crores, of which highest proportion was for social services sector (35.17 per cent) followed by energy sector (21.38 per cent), irrigation and flood control (16.57 per cent), agriculture and allied activities (10.65 per cent), rural development (10.07 per cent) and lowest (0.59 per cent) for science, technology and environment sector.

On 1st November, 2000, the reorganised state of Madhya Pradesh came into existence. The 16 districts of old state were separated to form a new state known as "Chhattisgarh State". The actual expenditure of the plan for the year 2000-2001 was Rs.3,177.38 crores (inclusive of part expenditure for undivided M.P.). The actual expenditure for the year 2001-02 of the tenth plan was Rs.3,801 crores. The highest expenditure was made on social services sector followed by irrigation and flood control sector, rural development sector, energy sector, agriculture and allied activities and transport sector.

In the ninth five year plan, the total outlay was Rs.20,075.00 crores, which was 80.85 per cent more than the outlay of eighth plan of Rs.11,100.00 crores. The total expenditure of the plan was Rs.17,288.32 crores which was 41.10 per cent higher than the expenditure of eighth plan of Rs.12,252.21 crores. Of the total expenditure of the plan, 36.12 per cent was towards social services followed by 17.96 per cent for energy, 17.56 per cent for irrigation and flood control, 10.42 per cent for rural development and 9.32 per cent for agriculture and allied activities (Table 2.12).

Table 2.12 Ninth Five Year Plan (1997-2002) outlay and expenditure

(Rs. in crore)

Major Sector	Ninth Plan (Un-divided MP)	Percentage to total plan	Actual Expenditure 1997-98, 1998-99 and 1999-2000	Actual Expenditure 2000-01*	Actual Expenditure 2001-02	Total Expenditure
Agriculture & Allied Activities	1,129.50	5.63	1,098.18 (10.65)	211.00 (6.64)	302.98 (7.97)	1,612.16 (9.32)
Rural Development	2,005.59	9.99	1,038.16 (10.07)	325.66 (10.25)	438.65 (11.54)	1,802.47 (10.42)
Irrigation and Flood Control	2,722.02	13.56	1,708.50 (16.57)	576.35 (18.14)	750.35 (19.74)	3,035.20 (17.56)
Energy	3,479.46	17.33	2,204.13 (21.38)	511.79 (16.11)	389.15 (10.24)	3,105.07 (17.96)
Industry and Mining	1,112.97	5.55	133.58 (1.30)	50.33 (1.58)	48.60 (1.28)	232.51 (1.34)
Transport	562.92	2.80	221.79 (2.15)	111.91 (3.52)	267.13 (7.03)	600.83 (3.47)
Science, Technology & Environment	210.20	1.05	60.37 (0.59)	35.37 (1.11)	145.98 (3.84)	241.72 (1.40)
General Economic Services	317.53	1.58	197.92 (1.92)	69.81 (2.20)	113.27 (2.98)	381.00 (2.20)
Social Services	8,506.69	42.37	3,626.37 (35.17)	1,279.80 (40.28)	1,338.29 (35.21)	6,244.46 (36.12)
General Services	28.12	0.14	20.94 (0.20)	5.36 (0.17)	6.60 (0.17)	32.90 (0.19)
Total	20,075.00	100.00	10,309.94 (100.00)	3,177.38 (100.00)	3,801.00 (100.00)	17,288.32 (100.00)

* Inclusive of part expenditure for undivided M.P.

Source : Draft *Tenth Five Year Plan 2002-2007 and Annual plan 2002-2003 (Vol.1), Govt. of M.P., Planning, Economics and Statistical Department 2002*

2.14 Tenth Five Year Plan (2002 - 2007)

The proposed total outlay for the tenth five year plan is Rs.25,737.25 crores, of which the proposed outlay for the first year of the plan(2002-03) is Rs.4,821 crores. In this plan also, highest priority is given to social services sector, followed by energy sector, irrigation and flood control sector, rural development sector, agriculture and allied activities and transport sector and least to science, technology and environment sector (Table 2.13).

Table 2.13 Proposed outlay for Tenth five year plan (2002-2007) and Annual Plan 2002-2003

(Rs. in crore)

Major Sector	Tenth Plan 2002-07 proposed outlay	Outlay for first year of the plan 2002-03
Agriculture & Allied Activities	1,617.94 (6.29)	305.91 (6.35)
Rural Development	2,881.16 (11.19)	575.32 (11.93)
Irrigation and Flood Control	4,915.88 (19.10)	848.52 (17.60)
Energy	5,506.20 (21.39)	914.83 (18.98)
Industry and Mining	202.38 (0.79)	41.19 (0.85)
Transport	1,353.05 (5.26)	279.60 (5.80)
Science, Technology & Environment	59.70 (0.23)	10.81 (0.22)
General Economic Services	723.24 (2.81)	154.14 (3.20)
Social Services	7,634.97 (29.66)	1,607.57 (33.35)
General Services	842.73 (3.28)	83.11 (1.72)
Total	25,737.25 (100.00)	4,821.00 (100.00)

2.15 Outlay and Expenditure (All five year plans)

The outlay for the second five year plan (1956-61) was Rs.190.90 crores. The outlay increased from one plan to another and was Rs.25,737.25 crores for the tenth five year plan, thus recording an increase of 135 times since second five year plan. However, the increase in outlay was not uniform in all the five year plans. Thus the percentage increase from second to third five year plan was 57.15 and that from third to fourth five year plan was 51.76. There was a sudden increase in the outlay in the fifth five year plan (Rs.1,379.79 crores) over fourth plan (Rs.455.28 crores) by 203.06 per cent. However the increase diminished in the latter five year plans so that it was 175.40 per cent from fifth to sixth plan, 84.21 per cent from sixth to seventh plan, and so on.

Like outlay, the expenditure for five year plans increased from one plan to another. It wasRs.148.92 crores in the second five year plan and increased to Rs.17,288.32 crores in the ninth five year plan or about 116 times of the second five year plan. The plan to plan variation in expenditure was such that in the third five year plan the expenditure was 92.51 per cent more than the second plan. It was 67.82 per cent more than third plan in the fourth plan. The percentage increase suddenly jumped and was highest (198.76 per cent) in the fifth

five year plan over the fourth five year plan. Thereafter the percentage increase declined and was 169.39, 70.21, 85.89 and 41.10 in the sixth, seventh, eighth and ninth plan respectively.

The percentage of expenditure incurred during a plan to outlay is an important indicator of implementation of plan programmes. It was observed that the percentage was 78.01 (and lowest) in the second five year plan. It increased to 95.56 per cent in the third five year plan. The expenditure was more than the outlay in fourth, fifth, sixth and eighth five year plans. In the seventh plan the expenditure was 94.16 per cent of the outlay but again was more than outlay in the eighth plan (110.38 per cent). In the ninth plan (for which data on expenditure was available) the expenditure was 86.12 per cent of the outlay (Table 2.14).

Table 2.14 Total Plan outlay, total expenditure and percentage of expenditure to outlay

Plan particulars	Total plan outlay (Rs. Crore)	% increase over previous plan	Total plan expendi-ture (Rs. crore)	% increase over previous plan	Percentage of expendi-ture to outlay
Second Five Year Plan (1956-61)	190.90	---	148.92	---	78.01
Third Five Year Plan (1961-66)	300.00	57.15	286.69	92.51	95.56
Three Annual Plan (1966-67, 1967-68 and 1968-69)	178.82		167.79		93.83
Fourth Five Year Plan (1969-74)	455.28	51.76	481.12	67.82	105.67
Fifth Five Year Plan (1974-79)	1,379.79	203.06	1,437.39	198.76	104.17
Annual Plan (1979-80)	379.40		514.83		135.69
Sixth Five Year Plan (1980-85)	3,800.00	175.40	3,872.27	169.39	101.90
Seventh Five Year Plan (1985-90)	7,000.00	84.21	6,591.18	70.21	94.16
Annual plan (1990-91)	2,000.00		1,703.52		85.18
Annual Plan (1991-92)	2,426.00		1,821.86		75.10
Eighth Five Year Plan (1992-97)	11,100.00	58.57	12,252.21	85.89	110.38
Ninth Five Year Plan (1997-2002)	20,075.00	80.86	17,288.32	41.10	86.12
Tenth Five Year Plan (2002-2007) and Annual Plan (2002-2003)	25,737.25 4,821.00	28.20	N.A.	N.A.	---

2.16 Provisions for Agriculture sector in different five years plan of India and Madhya Pradesh

The plan provision for agriculture during first five year plan (1951-56) for India was Rs.238 crores which increased to Rs.26,264 crores during the Ninth Five Year Plan. This increase was nearly 110 times. The gross cropped area of the country in 1955- 56 was

137.87 m.hectares. It rose to 191.07 m.ha. in 1996-97. The per hectare provisions for agricultural sector in India was Rs.17.30 in first five year plan, which increased to Rs.1,175.80 per hectare in the eighth five year plan. It means about 68 times increase.

In the case of Madhya Pradesh the provision for agriculture sector in the first plan was Rs.20.85 crores, which increased to Rs.651.92 crores in the eighth plan meaning nearly 31 times increase. The gross cropped area of the state in first plan was 17.0 m. hectares, which increased to 25.5 m.ha. in the eighth plan. The per hectare provision for agriculture in the state was Rs.12.30 in the first plan against Rs.254.70 in the eighth plan period. It indicates nearly 21 times increase from first plan and 8.94 times increase from the second plan. The percentage of plan provision of Madhya Pradesh to India was 18.3 in second plan. It came down to 2.9 per cent in the eighth plan. It shows decreasing trend. The percentage of cropped area of Madhya Pradesh to India was between 11.8 and 13.3 per cent in different plans (Table 2.15).

Table2 15 Plan provisions in agriculture sector India/ Madhya Pradesh

Five Year Plan	INDIA			MADHYA PRADESH			% of Plan Provided M.P. to India	% of Cropped Area of M.P. to India
	Plan Provision (Crore Rs.)	Gross Cropped Area (M.Ha.)	Per Hectare Provision (Rs.)	Plan Provision (Crore Rs.)	Gross Cropped Area (M.Ha.)	Per Hectare Provision (Rs.)		
First (1951-56)	238	137.87	17.3	20.85	17.0	12.3	8.8	12.3
Second (1956-61)	275	149.42	18.4	50.49	17.7	28.5	18.3	11.8
Third (1961-66)	591	156.39	49.1	76.45	18.5	41.0	10.0	11.8
Annual 1966-69	664	158.79	41.8	55.08	19.3	28.5	8.3	12.2
Fourth (1969-74)	2,059	165.44	124.5	127.43	20.7	61.4	6.2	12.5
Fifth (1974-79)	3,356	171.05	196.2	240.66	21.3	113.0	7.2	12.5
Sixth (1980-85)	6,440	175.94	366.0	183.20	22.1	82.9	2.8	12.6
Seventh (1985-90)	10,524	180.00	584.7	339.65	22.7	149.6	3.2	12.6
Eighth (1992-97)	22,467	191.07	1,175.8	651.92	25.5	254.7	2.9	13.3
Ninth (1997-2002)	26,264	---	---	NA	19.2	---	---	---

Source : Directorate of Agriculture, M.P., Ministry of Agriculture, G.O.I.

2.17 Allocation and Expenditure Across the Plan Periods on Agricultural Sector in Madhya Pradesh

During fourth plan (1969-74), the outlay envisaged for the agricultural sector was Rs. 4,433 lakhs, against which the expenditure incurred was Rs.4,250.07 lakhs, or 95.87 per cent of outlay. Of the total outlay of fourth plan, 33.61 per cent was for minor irrigation, 33.23 per cent was for agricultural production and the remaining 33.16 per cent for soil conservation. In the case of expenditure, it was highest (43.31 per cent) for agricultural production followed by soil conservation (41.65 per cent) and minor irrigation (15.04 per cent). The percentage of expenditure to outlay was 124.97 per cent in agricultural production and 120.41 per cent for soil conservation. Thus in these two sectors the expenditure was more than the outlay. In minor irrigation, it was 42.89 per cent meaning thereby that the expenditure was less than the outlay.

In the fifth five year plan (1974-79), the total expenditure for the agricultural sector was Rs.5,003.70 lakhs which was 90.83 per cent of the total outlay of Rs.5,508.88 lakhs. Of the total outlay of V plan, 51.64 per cent was for agricultural production followed by soil conservation (39.54 per cent) and minor irrigation (8.82 per cent). In the case of expenditure, the highest (46.55 per cent) share was towards soil conservation followed by agricultural production (45.52 per cent) and minor irrigation (7.93 per cent). When we compare the programme wise expenditure to outlay, it was highest (106.92 per cent) in soil conservation followed by minor irrigation (81.73 per cent) and agricultural production (80.06 per cent).

During the sixth plan (1980-85), the total expenditure for agricultural sector was Rs.13,417.89 lakhs against the total outlay of Rs.17,695.00 lakhs. Of the total outlay, highest share was for agricultural production (40.55 per cent), followed by minor irrigation (35.72 per cent), soil conservation (20.91 per cent) and micro-minor irrigation (2.82 per cent). Similar trend was observed in the case of expenditure. The expenditure made in each programme was less than the outlay. The percentage of expenditure to outlay was highest (97.62) for soil conservation followed by agricultural production (77.47), minor irrigation (64.40) and micro-minor irrigation (35.45).

The total outlay for agricultural sector during seventh plan (1985-90) was Rs.29,764.89 lakhs and the total expenditure was Rs.25,119.25 lakhs which was 84.39 per

cent of the total outlay. For all the programmes, the expenditure was less than the outlay. The highest proportion of outlay was for agricultural production (60.50 per cent) followed by minor irrigation (21.39 per cent) and soil conservation (14.74 per cent). More or less similar trend was observed in the case of expenditure. The percentage of expenditure to outlay was 97.25 for soil conservation followed by agricultural production (87.02 per cent), micro-minor irrigation (83.89 per cent) and minor irrigation (68.16 per cent).

The total outlay and expenditure for agricultural sector during eighth plan (1992-97) was Rs.65,192.00 lakhs and Rs.47,585 lakhs respectively. Of the total outlay, the highest proportion was made for agricultural production purpose (46.65 per cent) followed by minor irrigation (30.09 per cent), soil conservation (9.73 per cent), micro- minor irrigation (7.08 per cent) and research and education (6.45 per cent). Among all the programmes, only research and education, the expenditure made was more than the outlay. When we compare the programmewise expenditure to outlay it was highest in research and education (128.20 per cent) and lowest in minor irrigation (52.85 per cent).

During ninth plan (1997-2002), the total outlay for agricultural sector was Rs.60,528.65 lakhs, of which 64.40 per cent was for agricultural production followed by research and education (12.32 per cent), minor irrigation (10.24 per cent), soil conservation (6.68 per cent) and micro-minor irrigation (6.36 per cent). The total expenditure was Rs.56,309.92 lakhs or 93.03 per cent of the total outlay. The expenditure was more than the outlay in the case of research and education and micro-minor irrigation. The percentage of expenditure to outlay was 104.66 in the case of research and education followed by micro-minor irrigation (100.46), soil conservation (95.98), agricultural production (94.75) and minor irrigation (61.68).

The proposed outlay for the agricultural sector during tenth plan was Rs.81,612.00 lakhs of which highest share was for agricultural production (76.66 per cent) and lowest towards minor irrigation (4.90 per cent).

When we compare the successive plans of the state for agricultural sector it is observed that the outlay was Rs.4,433.00 lakhs in the fourth plan which increased to Rs.81,612.00 lakhs in the tenth plan. There was 1,841 fold increase in the outlay. The outlay

for agricultural production during fourth plan was Rs.1,473.00 lakhs, which increased to Rs.38,981.15 lakhs in ninth plan and to Rs.62,566.00 lakhs in the tenth plan. The total outlay for minor irrigation purposes was Rs.1,490.00 lakhs in the fourth plan, and increased to Rs.6,199.25 lakhs in the ninth plan. The outlay for soil conservation was Rs.1,470.00 lakhs in the fourth plan, which increased to Rs.4,039.81 lakhs in the ninth plan. In the sixth plan, agricultural research and education attracted the attention of State Government. The outlay for this sector was Rs.400.60 lakhs during sixth plan and increased to Rs.7,458.82 lakhs in the ninth plan. The percentage of expenditure to outlay was highest for this sector in each plan. The government is paying more attention to agricultural research and education sector. (Table 2.16).

2.18 AGRICULTURE AND ALLIED SERVICES* IN THE EIGHTH, NINTH AND TENTH FIVE YEAR PLAN

2.18.1 Agriculture

Agriculture is the mainstay of the state's economy. About 75 per cent of the working force, as per 1991 census, depend upon agriculture in one way or the other. Approximately 49 per cent of the geographical area is under cultivation. As per the Agriculture Census of 1995-96, the cultivated area of 165.78 lakh hectares is under 66.37 lakhs land holdings and area falling within various categories is as mentioned in table 1.5 of chapter 1. The predominance of marginal and small land holders which calls for sustained efforts for improving the living standard of such marginalised population.

Change in the cropping pattern over the years - 1956-57 is one of the positive factors of agriculture sector. During the year 1956-57 about 63 per cent of the gross cropped area was under cereal crops and that remained more or less the same during the period of "Grow More Food" campaign.

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* Sources : 1) Draft Ninth Five Year Plan (1997-2000) and Annual Plan (1997-98) Vol. I
2) Draft Tenth Five Year Plan (2002-2007) and Annual Plan (2002-2003) Vol.I
3) Planning, Economics and Statistics Department, Govt. of Madhya Pradesh, Bhopal (M.P.)

Table 2.16 Allocation and expenditure across the plan periods on agricultural sector in Madhya Pradesh

(Rs. In lakhs)

Groups	IVth Plan (1969-74)			Vth Plan (1974-79)			VIth Plan (1980-85)			VIIth Plan (1985-90)		
	Proposed outlay	Expenditure	% of expenditure to outlay	Proposed outlay	Expenditure	% of expenditure to outlay	Proposed outlay	Expenditure	% of expenditure to outlay	Proposed outlay	Expenditure	% of expenditure to outlay
Agricultural Production	1,473.0 (33.23)	1,840.87 (43.31)	124.97	2,844.74 (51.64)	2,277.60 (45.52)	80.06	7,175.0 (40.55)	5,558.68 (41.43)	77.47	18,007.32 (60.50)	15,670.74 (62.39)	87.02
Minor Irrigation	1,490.0 (33.61)	639.16 (15.04)	42.89 --	485.84 (8.82)	397.09 (7.93)	81.73	6,320.0 (35.72)	4,069.89 (30.33)	64.40	6,365.57 (21.39)	4,338.69 (17.27)	68.16
Micro Irrigation							500.0 (2.82)	177.25 (1.32)	35.45	1,003.00 (3.37)	841.47 (3.35)	83.89
Soil Conservation	1,470.0 (33.16)	1,770.11 (41.65)	120.41	2,178.30 (39.54)	2,329.01 (46.55)	106.92	3,700.0 (20.91)	3,612.07 (26.92)	97.62	4.389.00 (14.74)	4,268.35 (16.99)	97.25
Research & Education	---	---	---	---	---	---	---	---	---	---	---	
Total	4,433.00 (100.00)	4,250.07 (100.00)	95.87	5,508.88 (100.00)	5,003.70 (100.00)	90.83	17,695.00 (100.00)	13,417.89 (100.00)	75.83	29,764.89 (100.00)	25,119.25 (100.00)	84.39

Groups	VIIIth Plan (1992-97)			IXth Plan (1997-2002)			Xth Plan (2002-07)
	Proposed outlay	Expenditure	% of expenditure to outlay	Proposed outlay	Expenditure	% of expenditure to outlay	Proposed outlay
Agricultural Production	30,411.00 (46.65)	23,197.00 (48.75)	76.28	38,981.15 (64.40)	36,934.76 (65.59)	94.75	62,566.00 (76.66)
Minor Irrigation	19,615.00 (30.09)	10,366.00 (21.78)	52.85	6,199.25 (10.24)	3,823.90 (6.79)	61.68	4,000.00 (4.90)
Micro Irrigation	4,615.00 (7.08)	3,812.00 (8.01)	82.60	3,849.62 (6.36)	3,867.39 (6.87)	100.46	4,146.00 (5.08)
Soil Conservation	6,346.00 (9.73)	4,819.00 (10.13)	75.94	4,039.81 (6.68)	3,877.55 (6.89)	95.98	4,222.00 (5.18)
Research & Education	4,205.00 (6.45)	5,391.00 (11.33)	128.20	7,458.82 (12.32)	7,806.32 (13.86)	104.66	6,678.00 (8.18)
Total	65,192.00 (100.00)	47,585.00 (100.00)	72.99	60,528.65 (100.00)	56,309.92 (100.00)	93.03	81,612.00 (100.00)

However, after the introduction of soybean in 1980-81 some low value cereal crops were replaced and the percentage coverage of cereals declined to 41 per cent of the cropped area in 1999-2000. Similarly the percentage coverage of oilseed crops increased from 1980-81 onwards.

The change in cropping pattern has borne fruits which is evident from the fact that in 1999-2000 the share of soybean production to national production was about 70 per cent and that of oilseeds was about 27 per cent. The State leads the country in oilseeds and pulses production with 27.5 and 25.3 per cent, gram 49.5 per cent and linseed 27.5 per cent. The state stood "First" in National Production w.r.t. all the above crops.

Even with all these achievements agriculture in Madhya Pradesh is still traditional, and the economy is basically agrarian. The undulating topography, unutilised irrigation potential, practice of keeping land fallow during kharif and taking only one crop in rabi make it imperative that the soil and water conservation, ground water development, crop diversification and substitution are to be undertaken on priority to accelerate growth in agricultural production.

2.18.1.1 Eighth Five Year Plan

2.18.1.1.1 Strategies

The core strategies for increasing the agricultural production during the eighth five year plan were-

1. Implementation of soil and water conservation schemes.
2. Rationalisation of cropping pattern through crop substitution and diversification and introduction of new crops like fodder and suitable varieties of rapeseed and mustard.
3. Wasteland development to augment fodder.
4. Strengthening of input supplies and services.
5. Augmenting irrigated area through minor irrigation schemes.

2.18.1.1.2 Outlay and expenditure

The outlay envisaged for the agricultural sector in the eighth plan (1992-93 to 1996-97) was Rs.48,242 lakhs, against which the expenditure incurred was Rs.43,043 lakhs.

Under minor irrigation programme sinking of tubewells and setting of sprinklers have achieved significant progress

		Target	Achievement
Tubewells	(No.)	12,000	21,600
Sprinklers	(No.)	15,000	23,855

2.18.1.2 Ninth Five Year Plan

2.18.1.2.1 Strategies

For enhancing the agriculture production the important strategies envisaged during the ninth plan were :

1. Assigning highest priority to management of dry land and accelerating the pace of the utilisation of created irrigation potential.
2. Effective transfer of technology to farmers through an efficient extension net work.
3. Production and distribution of quality seed and fertilizers/ pesticides to the farmers.
4. Encouragement to cooperatives and NGOs to take up seed production programme in remote areas and incentive to societies for advance storage of fertilizers in these areas.

2.18.1.2.2 Outlay and expenditure

The approved outlay for the ninth plan for agriculture sector was Rs.26,264.00 lakhs.

Table 2.17 Outlay for agricultural sector during ninth plan

S.No.	Name of the Group	Outlay (Rs. in lakhs)
1	Agricultural Production	12,831
2	Research and Education	467
3	Minor Irrigation	5,397
4	Micro-minor Irrigation	4,673
5	Soil Conservation	2,896
Total		**26,264**

Table 2.18 Yearwise expenditure during first four years of ninth plan

(Rs. in lakhs)

S.No.	Name of the Group	1997-98	1998-99	1999-2000	2000-2001
1	Agricultural Production	5,451.93	5,892.48	7,996.08	6,875.60
2	Research and Education	1,455.00	2,282.20	888.10	1,865.06
3	Minor Irrigation	1,260.83	397.56	402.55	502.70
4	Micro-minor Irrigation	983.65	787.93	571.69	700.96
5	Soil Conservation	479.62	777.36	835.05	953.68

Table 2.19 Approved outlay and expenditure for agricultural sector, Annual Plan 2001- 2002

(Rs. in lakhs)

S.No.	Name of the Group	Approved outlay	Anticipated Expenditure
1	Agricultural Production	8,857.01	8,814.20
2	Research and Education	1,315.96	1,315.96
3	Minor Irrigation	1,260.00	1,260.00
4	Micro-minor Irrigation	816.62	816.62
5	Soil Conservation	831.84	831.84

The estimate of production level achieved in the end of IX th Plan as compared to VIIIth Plan is given in table 2.20.

Table 2.20 Production of crops at the end of eighth and ninth plan

S.No.	Crops / Crop groups	Unit	Eighth Plan (1996-97) level	Ninth Plan (1999-2000) level
1	Cereals	Lakh Tonnes	110.45	126.38
2	Pulses	- do -	31.79	34.26
3	Foodgrains	- do -	142.24	160.64
4	Oilseeds	- do -	49.45	57.45
5	Cotton	Lakh bales	4.24	4.17
6	Sugar Cane (Gur)	Lakh Tonnes	1.69	2.14

From the above table it is clear that in all the crop groups (except cotton) there was substantial increase in production during ninth plan period.

2.18.1.2.3. New Schemes proposed during Ninth Plan

i) Development of organic farming programme.

ii) State level training institute at Bhopal.

iii) Establishment of new soil testing laboratories at Betul, Rajgarh and Guna.

iv) DANIDA Aided Comprehensive Development Project in Western Part of M.P. in the districts of Dhar, Jhabua and Ratlam.

v) Japan aided Bhoj Wet Land Project.

2.18.1.2.4 Important schemes under central sector

i) National Watershed Development Programme.

ii) Demonstrations of Millets and Maize.

iii) Distribution of small tractors on subsidy.

iv) River valley project and flood prone area development programme.

v) Reclamation of alkali (USAR) soils.

vi) Seed production scheme for draught prone area.

2.18.1.3 Tenth Five Year Plan and Annual Plan, 2002-2003

The policy approach to agriculture, particularly in 1990s has been to secure increased production through subsidies in inputs such as power, water and fertilizer rather than building/ capital assets. This strategy has run into serious difficulties as the subsidies have become financially unsustainable.

2.18.1.3.1 Strategies

The proposed strategies for the tenth plan are :

1. Focus on raising the productivity of land in a manner which is sustainable over a long period.
2. Bringing the uncultivated wasteland into productive use whether in agriculture or horticulture.
3. Increasing work opportunities and productivity of women farmers.
4. Raising cropping intensity which is at present 135 per cent.
5. Enhancing rain water harvesting and increasing the irrigation potential through scientific watershed development.
6. Emphasizing ground water development
7. Watershed Development Programme with peoples' participation.
8. Rural and district road connectivity through mandi funds.
9. Strengthening of agricultural research and development system. A radical overhaul of extension activities. Specific measures will be taken to ensure that research, technology development and extension services meet the specific needs of women farmers.
10. An increased focus on subsistence crops and technologies in rainfed / dry land areas.
11. Concentrating on small and marginal farmers and on rainfed areas where returns to both capital and labour are high.
12. Diversification of agriculture to meet the enhanced food and nutritional needs.
13. Organic farming would be promoted in the state as organically produced products fetch premium prices in the international market.
14. Farm mechanisation would be given special thrust.

2.18.1.3.2 Proposed outlay

The proposed outlay for the tenth plan and annual plan 2002-2003 is Rs.81,612.00 lakhs and Rs.14,927.70 lakhs respectively.

Table 2.21 Proposed outlay for agricultural sector during tenth plan and annual plan 2002-03

(Rs. Lakh)

S.No.	Groups	Proposed outlay for Tenth Plan 2002- 07	Proposed outlay for Annual Plan 2002-03
1	Crop Husbandry	62,566.00	10,963.70
2	Research and Education	6,678.00	1,316.00
3	Minor Irrigation	4,000.00	1,000.00
4	Micro Minor Irrigation	4,146.00	817.00
5	Soil Conservation	4,222.00	831.00
Total		**81,612.00**	**14,927.70**

2.18.1.3.3 Production Target in Tenth Plan

The proposed physical targets of production in tenth plan was 139.54 lakh tonnes for cereals and 38.96 lakh tonnes for pulses (Table 2.22)

Table 2.22 Physical targets of crop production in tenth plan and annual plan 2002-03

S.No.	Item	Unit	Tenth Plan 2002-2007	Annual Plan 2002-2003
	Crop Production			
1	Cereals	Lakh Tonnes	139.54	110.80
2	Pulses	Lakh Tonnes	38.96	31.27
3	Food grains	Lakh Tonnes	178.50	142.07
4	Oil Seeds	Lakh Tonnes	60.40	52.63
5	Sugar Cane (Gur)	Lakh Tonnes	2.50	1.98
6	Cotton	Lakh bales	4.40	3.76
7	Distribution of Seeds	000 Qtls	2,720.00	520.00
8	N.P.K.	Lakh Tonnes	46.55	8.10
9	Installation of bio-gas Plants	Nos	56,300	10,500
10	Improved Implements	Nos	5,00,000	1,00,000
11	Construction of small Percolation tank	Nos	2,190	370
12	Tube Wells	Nos	35,000	6,900
13	NWDPRA	Hect.	3,02,000	55,500
14	R.V. Projects	Hect.	75,460	12,460

2.18.2 Horticulture

Horticulture crops are important as they generate extensive employment and income opportunities. Being perennial, these crops also help in checking soil erosion and provide high density green cover to the soil. Being tough, many of these crops can successfully be grown on waste land not suitable for traditional crop cultivation.

The state has immense potential for horticultural development. In the year 1998-99 the horticulture crops covered an area of 524.00 thousand hectares, out of which fruits were sown on 50.30 thousand hectares, vegetables on 153.10 thousand hectares, spices on 301.20

thousand hectares, medicinal plants on 20.10 thousand hectares and floriculture on 1.30 thousand hectares. The total area, thus, covered under horticulture crops was 2.58 per cent of gross cropped area. The existing area under horticultural crops (5.24 lakh hect.) can be extended to 26.40 lakh hectares. In view of such a huge potential, the State Government has already initiated a well thought out Integrated Horticultural Development Programme.

2.18.2.1 Eighth Five Year Plan

2.18.2.1.1 Outlay and expenditure

The outlay envisaged for horticulture sector in the eighth plan was Rs.4,896 lakhs at constant prices (1991-92), against which the actual expenditure incurred in 1992-93, 1993-94, 1994-95, 1995-96 and 1996-97 was Rs. 1,364.43 lakhs, Rs.1,592.45 lakhs, Rs.1,351.33 lakh, Rs.1,561.57 lakhs and Rs.1,478.06 lakhs respectively. Thus, the total actual expenditure incurred in VIIIth plan was Rs.7,347.84 lakhs.

2.18.2.1.2 Achievement during eighth plan

By the end of VIIIth Plan about 56,000 hectares have been covered under fruit development programme, 28,000 hectares under vegetable development, 30,000 hectares under spices development, 2,000 hectares under floriculture development, 250 hectares under aromatic and medicinal plants. Nearly 0.75 lakh fruit plants, 468 lakhs aromatic and medicinal plants were distributed and 250 staff members and 2,100 other persons have been trained under fruit preservation training programme.

2.18.2.2 Ninth Five Year Plan

2.18.2.2.1 Strategies

The following strategies were envisaged during the ninth plan for the development of horticulture sector :-

1. Area extension under fruits, vegetables, floriculture, spices and medicinal and aromatic plants.
2. Proper selection of horticulture crops on the basis of soil type, climatic factors and available irrigation sources.
3. Popularising development of nursuries among cultivators.
4. Strengthening extension services and research support.
5. Development of better marketing, processing and storage support.
6. Introduction of non-traditional horticulture crops.

2.18.2.2.2 Outlay and expenditure

The outlay approved for the ninth plan was Rs.6,308.00 lakhs, against which the expenditure in first four years was Rs.1,384.00 lakhs, Rs.1,326.48 lakhs, Rs.1,620.75 lakhs and Rs.1,533.56 lakhs. Approved outlay for annual plan is Rs. 2,046.48 lakhs against which an expenditure of Rs.2,045.55 lakhs is expected.

2.18.2.2.3 Physical achievement of Horticulture sector during ninth plan

The important physical achievements during the ninth plan included training of 373 officers and employees, 747 banana demonstrations etc. (Table 2.23)

Table 2.23 Physical target and achievement of horticulture sector during ninth plan

S. No.	Item	Unit	Ninth Plan Target	Plan Achieve-ment
1	Training of officers and employees	No.	710	373
2	Training of gardeners	No.	400	194
3	Training for fruit preservation	No.	9,800	7,948
4	Production of banana	No. of demonstrations	1,163	747
5	Production of vegetables around big cities	Hect.	20,783	14,467
6	Potato Development Scheme	No. of demonstrations	35,657	32,327
7	Spices Development Programme	No. of Minikits	23,375	21,636
8	Floriculture Programme	No. of demonstrations	987	819
9	Medicinal and aromatic plants	No. of Minikits	8,411	3,228
10	Exhibition, fairs, etc.	No.	30	25
11	Mushroom Development	No. of trainees	684	179
12	Drip irrigation	Hect.	5,128	2,588
13	Grapes cultivation	Hect.	136.80	161.40
14	Seed production in vegetable farms	Qtl.	222.00	212.79
15	Community orchards	Hect.	1,103	1,103.00
16	Kitchen gardens	No. of beneficiaries	4,02,480	4,02,480

2.18.2.3 Tenth Five Year Plan and Annual Plan 2002-2003

2.18.2.3.1 Strategies

Strategies envisaged for the tenth plan are :-

1. Extensive fruit plantation on government and private fallow land and by the side of state highways and irrigation canals.
2. Encouraging farm forestry
3. Popularising plantation of medicinal and aromatic varieties.

4. Providing improved varieties of vegetable seeds to the cultivators and agricultural labourers living below the poverty line.

5. Adopting cluster approach in selected villages for the development of vegetables and other horticulture produce.

2.18.2.3.2 Proposed Outlay

The proposed outlay for the tenth plan and annual plan 2002-2003 are Rs.7,743.80 Lakhs and Rs.1,548.76 lakhs respectively.

2.18.2.3.3. Physical targets of horticulture sector during tenth plan

The important physical details of the tenth plan and annual plan 2002-2003 are given below (Table 2.24).

Table 2.24 Physical targets of horticulture sector during tenth plan and annual plan, 2002-03

S. No.	Item	Unit	Tenth Plan 2002-2007 Target	Annual Plan 2002-03 Target
1	Intensive Fruit Development Programme	No. of plants (lakh)	80	16
2	Horticulture training to officers and employees	No.	600	120
3	Training of gardeners	No.	400	100
4	Training for food preservation	No.	6,500	1,300
5	Estt. Of new gardens and nurseries	No. of plants (lakh)	170	34
6	Production of banana	No. of demonstration	2,769	549
7	Subsidy on fruit plantation	No. of plants (lakh)	50	10
8	Production of vegetable around big cities	Hectare	34,666	6,933
9	Potato Development Scheme	No. of demonstration	22,000	4,400
10	Horticulture Development Programme	No. of plants (lakh)	70	14
11	Spices Development Programme	Minikits	45,000	9,200
12	Floriculture Programme	No. of demonstration	1,500	300
13	Estt. Of Rose Garden	No. of plants (lakh)	30	6
14	Medicinal and aromatic plants	No. of minikits	23,000	4,666
15	Exhibition, fairs etc.	No.	25	5
16	Marketing Training	No.	50	10
17	Farm Forestry (Rubber and Oil Palm)	No. of demonstration	10	2
18	Training regarding Mushroom Development	No.	800	200
19	Special crops	No. of demonstration	20	4
20	Research Programme	No. of trial plots	5	1
21	Grape cultivation	Hectare	132	28
22	Seed Production in Vegetable Farm	Qtl.	375	75
23	Community Orchard	Hectare	777	184
24	Kitchen Garden	Beneficiaries	22,16,000	4,99,200
25	Horticulture Development on the waste land	Hectare	4,300	860

2.18.3 Animal Husbandry and Dairy Development

An important component of agricultural diversification is animal husbandry including dairying and poultry which hold immense promise for improving the rural livelihood by providing additional source of income and employment, specially to landless and small and marginal farmers. Proper development of this sector will require attention not only to technology, processing and marketing arrangements but also to issues of animal welfare. In particular, disaster management programmes for livestock need to be devised since such asset loss can drive the poor into destitution.

Dairying is equally important sector of rural economy providing not only the calory value but offering additional employment opportunities, particularly in the lean season of agriculture. With a view to directly involve the milk producers in organised dairy development activities, a World Bank assisted programme was launched based on the celebrated "Anand Pattern". This programme envisaged dairy development on cooperative lines in 9 districts of Madhya Pradesh clubbed into three milk sheds viz. Bhopal, Indore and Ujjain. Based on the initial success of the World Bank assisted project, Operation Flood-II Programme was initiated in the year 1980-81 in four milk sheds of Gwalior, Jabalpur, Raipur and Sagar in 29 districts. In the remaining 16 districts the dairy development department is implementing milk schemes.

Of late, the dairy development functions have been merged with Animal Husbandry Directorate.

2.18.3.1 Eighth Five Year Plan

2.18.3.1.1 Outlay and expenditure

The outlay envisaged for the eighth plan for animal husbandry sector was Rs.5,586 lakhs at constant prices(1991-92). During the years 1992-93, 1993-94, 1994-95, 1995-96 and 1996-97 the expenditure was Rs.1,029 lakhs, Rs.1,203 lakhs, Rs.1,239 lakhs, Rs.1,405 lakhs and Rs.1,649.51 lakhs respectively.

2.18.3.1.2 Production targets and achievements

Against the target of 5,700 thousand tonnes of milk the achievement was 5,205 tonnes by the end of the plan. Against the production target of 1,130 million eggs the achievement was 1,250 million eggs by the end of the plan (Table 2.25).

Table 2.25 Production target and achievement for milk, egg and wool during the eighth plan

Item	Unit	Eighth Plan target	Achievement during the year				
			1992-93	1993-94	1994-95	1995-96	1996-97
1. Milk	'000 Tonnes	5,700	4,913	5,212	5,047	5,270	5,205
2. Egg	Million Number	1,130	1,065	1,090	1,145	1,155	1,250
3. Wool	Lakh kg.	9.40	6.90	7.50	7.84	7.84	7.95

2.18.3.2 Ninth Five Year Plan

2.18.3.2.1 Strategies

The strategies envisaged in the ninth plan for animal husbandry and dairy development were :-

1. Opening new dispensaries, upgradation of existing dispensaries, hospitals, providing diagnostic facilities and introduction of Gosewak Yojana in far flung areas.
2. Conservation and preservation of indigeneous breeds, increasing production capacity of central semen bank, conservation of all liquid semen insemination units into frozen semen units.
3. Emphasis on making poultry programme more viable.
4. Undertaking massive programmes for development of sheep, goat and pig.
5. Encouraging Fodder Development Programme.
6. Motivating SC and ST communities to adopt dairying and animal husbandry as one of the means of livelihood.
7. Consolidate the gains of Operation Flood Programme.
8. To help the cooperative milk unions and government milk supply schemes to become commercially viable institutions to face open competition.

2.18.3.2.2 Outlay and expenditure

The approved outlay for the ninth plan for animal husbandry and dairy development was Rs.9,479.00 lakhs : Rs.4,792.00 lakhs for animal husbandry and Rs.4,687.00 lakhs for dairy development. During the first four years of the ninth plan year wise expenditure incurred was (1997-98) Rs.1,772.26 lakhs, (1998-99) Rs.2,376.40 lakhs, (1999-2000) Rs.2,352.79 lakhs and (2000-2001) Rs.2,452.99 lakhs, since in 2000-01 the dairy sector was merged with animal husbandry sector.

Annual Plan 2001-02 : Outlay approved for annual plan 2001-02 is Rs.2,737.35 lakhs against which an expenditure of Rs.2,388.24 lakh is anticipated.

2.18.3.2.3 Physical achievement during ninth plan

In the ninth plan 190 new veterinary hospitals were established and 4,575 individuals were benefitted by cattle breeding programme (Table 2.26).

Table 2.26 Physical target and achievement of animal husbandry and dairy development sector during ninth plan

S. No.	Item	Unit	Ninth Plan	
			Target	Achievement
1	Establishment of new veterinary hospitals	Nos.	500	190
2	Supply of Buffalo for breeding on subsidy	Nos.	800	152
3	Supply of poultry units under Intensive Poultry Development Programmes	No. of beneficiaries	7,500	31,784
4	Supply of goat for breeding on exchange basis	Nos.	6,600	4,935
5	Supply of male pig unit on exchange basis	Nos.	500	1,982
6	Subsidy for fodder demonstration	No. of plots	25,000	28,111
7	Cattle Breeding Programme	No. of beneficiaries	35,000	4,575

2.18.3.3 Tenth Five Year Plan, and Annual Plan, 2002-2003

The basic functions of animal husbandry sector are: -

1. To look after health of the livestock through various veterinary health infrastructure units.
2. Breeding of cattle through natural and artificial means.
3. Development of goat, sheep and pigs.
4. Undertaking fodder development programmes.
5. Poultry development, particularly by arresting various diseases.
6. Acquainting the personnel with latest techniques of animal husbandry devices through continuous training.

2.18.3.3.1 Strategies

To perform the aforesaid functions efficiently the strategies envisaged during the tenth plan are :-

1. Improving livestock health by establishing new hospitals/dispensaries and augmenting the existing ones. The present status of one veterinary health institution for 15,125 livestock against the G.O.I recommendations of one institution for 5,000 livestock shall have to be improved.
2. Making sufficient provision for purchase of medicines and instruments.

3. Making available sufficient stock of liquid nitrogen for artificial insemination.
4. Sufficient provision for purchase of Cairo-cannes for keeping liquid nitrogen.
5. Recommending the subsidy programme for purchase of animal feed cutters.
6. Initiating the programme of extending subsidy for constructing silage pits to popularise stall feeding.
7. To initiate providing of `Goat Units` to persons living below the poverty line.

2.18.3.3.2 Proposed outlay

The proposed outlay for the tenth plan and annual plan 2002-2003 for Animal Husbandry and Dairy Development is Rs. 16,244.00 lakhs and Rs. 3,201.00 lakhs respectively.

2.18.3.3.3 Production targets

Table 2.27 Production target for animal husbandry and dairy development sector during tenth plan and annual plan 2002- 03

S. No	Item	Unit	Tenth Plan 2002-2007 Target	Annual Plan 2002-2003 Target
1.	Milk Production	000 mt.	4,400	3,900
2.	Egg Production	Million	106	93
3.	Wool Production	Lakh Kg	8.25	8.20
4.	Breeding coverage Females	Lakh breedable	25.00	23.50
5.	Distribution of breeding bulls on subsidy	Number	1,810	55
6.	Distribution of Poultry MPPP units	No. of units	18,000	2,300
7.	Distribution of breeding bucks on exchange basis	Number	3,300	669
8.	Distribution of boars on exchange basis	Number	2,000	380
9.	Distribution of pig trios on exchange basis	Number	320	32
10.	Distribution of fodder plots	Number	9,000	1,060
11.	Distribution of dairy units	Number	2,390	155

2.18.4 Fisheries

Inland fisheries is an integral component of rural development programmes in Madhya Pradesh. It is gaining importance for its potential for employment and income generation. It is one of the important aspects of agricultural diversification which holds promise for improving not only the rural but urban livelihoods as well.

Madhya Pradesh possesses 2.84 lakh hectares of water area in the form of large, medium and small irrigation reservoirs, village and private ponds, out of which 2.37 lakh hectares of water area at present is under fish culture (after division of the state in 2000-01).

Besides, the state has major rivers viz. Narmada, Tapti and Mahi and their tributaries forming a network of 17,088 kms. Fishing in rivers is free for the members of scheduled castes and scheduled tribe communities. The fishing in these waters is on decline due to lack of any regulation.

Out of 2.03 lakh hectares of water area of the reservoirs brought under fish culture, ten reservoirs having a water area of 1.21 lakh hectares is with M.P. Fisheries Federation Ltd.

A total of 0.11 lakh hectare water area is with the Fisheries Department for research, training and seed production purposes. The fishing in these water bodies is done on royalty basis for which Fisherman Cooperatives pay a nominal royalty to the department and the fish is marketed by the societies. About 0.27 lakh hectares area has been leased out to the fisheries cooperatives by Panchayats on 7 to 10 years lease for fish culture and fish production as per guide lines laid down by the department.

2.18.4.1 Eighth Five Year Plan

2.18.4.1.1 Outlay and expenditure

The outlay for the Eighth Plan was Rs.1,708 lakhs at constant prices (1991-92). During the years 1992-93, 1993-94, 1994-95, 1995-96 and 1996-97, the expenditure was Rs.342 lakhs, Rs.325.34 lakhs, Rs.343 lakhs, Rs.379.78 lakhs and Rs.641.38 lakhs respectively.

2.18.4.1.2 Production target and achievement

Production targets/ achievements are indicated in the table given below

Table 2.28 Production target and achievement of fisheries sector during eighth plan

Item	Unit	Eighth plan target	Actual Achievements during the year				
			1992-93	1993-94	1994-95	1995-96	1996-97
Fish Production	Lakh Tonnes	0.60	0.50	0.55	0.80	0.91	1.10
Fish Seed Production	Million St. Fry.	600	345	462	523	564	612

After launching of Rajiv Gandhi Mission for Fisheries Development in 1994, 4,600 hectares of water area under village ponds and 7,700 hectares of water area under irrigation reservoirs have been brought under fish culture.

2.18.4.2 Ninth Five Year Plan

2.18.4.2.1 Strategies

The following strategies were proposed for the ninth plan :-

1. Bringing additional water area under fish culture.
2. Enhancing fish seed productivity and reducing mortality of fish seed in rearing.
3. Increasing fish production
4. Generating additional employment and increasing the income.
5. Promote activities through fishermen cooperative societies.
6. Emphasis on fishermen's training.
7. Promote welfare activities.

2.18.4.2.2 Outlay and expenditure

The outlay approved for the ninth plan was Rs.3,084.00 lakhs, the year wise expenditure incurred is (1997-98) Rs.619.62 lakhs, (1998-99), Rs.537.81 lakhs, (1999-2000) Rs.589.03 lakhs and (2000-01) Rs.465.88 lakhs.

Annual Plan 2001-02 : Approved outlay for annual plan 2001-02 is Rs.589.03 lakhs against which likely expenditure is Rs.485.78 lakhs.

2.18.4.2.3 Production target

The production targets proposed in ninth plan is given below (Table 2.29).

Table 2.29 Production target for fisheries sector during ninth plan

S. No.	Item	Unit	Ninth Plan 1997-2002	Annual Plan 1997-98
1	Water area coverage under fish culture	Hectares	--	5,000
2	Fish Production	Lakh tonnes	1.54	1.11
3	Fish Seed Production	Million St. fry	10,000	750
4	Assistance to ST/SC fishermen for fish culture	Nos.	10,000	1,800

The main targets and achievements during ninth plan (after division of the state till the end of 2000-2001) are given below :-

Item	Unit	Ninth Plan Target	Achievement year ending 2000-2001 (Base level)
Fish Production	Ton	54,000	49,000
Fish Seed Production	Lakh St. Fry.	5,000	3,400

2.18.4.2 Tenth Five Year Plan and Annual Plan, 2002-2003

2.18.4.3.1 Strategies

The following strategies are envisaged for the tenth plan period :-

1. Stocking all the water bodies with genetically improved seed and using village ponds for seed rearing.
2. Encouraging fish seed production in private sector.
3. Popularising Pen and Cage culture for raising fingerlings.
4. Aquarium fish breeding and seed raising will be encouraged.
5. Introducing prawn culture in private sector.
6. For the purposes of fish culture all tanks and reservoirs of Forest Department, Local Bodies and Boards will be developed by Fisheries Department.
7. Fishermen housing will be promoted and a new scheme-saving-cum- relief will be introduced.
8. Fish Seed Farms and rearing ponds owned by the department will be leased out to un-employed graduates, fishermen cooperative societies etc. for seed production.

2.18.4.3.2 Outlays

The outlays envisaged for the tenth plan and annual plan 2002-2003 are Rs.2,989.00 lakhs and Rs. 589.00 lakhs respectively.

2.18.4.3.3 Production target

The important physical targets earmarked for the tenth plan and annual plan 2002-2003 are given below (Table 2.30).

Table 2.30 Physical target for fisheries sector during tenth plan and annual plan 2002-2003

S. No.	Item	Unit	Tenth Plan 2002-2007 Target	Annual Plan 2002-2003 Target
1	Additional area coverage	Hectare	1,40,000	13,700
2	Fish Production	MT	72,000	56,000
3	Fish- seed Production	Lakh (St. Fry)	7,500	5,500
4	Assistance to fishermen	Nos.	5,000	888
5	Training	Nos.	7,200	1,450
6	Leasing of pond (Water area)	Hectare	7,000	1,400
7	Extension and training	Nos./FM	7,000	1,450
8	Fishermen Coop. Societies	Nos./Socs.	700	140
9	National Welfare Fund for Fishermen's Housing	No.of Houses/ No. of Colonies	500/5	100/1
10	Insurance coverage to the fishermen	Nos.	55,000	51,000
11	Saving-Cum- Relief	No. of persons	31,000	5,000

2.18.5 Forest

Out of the total geographical area of 308.24 thousand sq.km., the forest constituting nearly 28 per cent of the total geographical area of the state. However, its productive capacity and actual production nowhere compares with its proportion or extent. About 40 per cent of these forests support economically important species such as teak, sal and bamboo. Forests are prime source of non-tax revenue of the state which is evident from the fact that in the year 1998-99 the gross revenue earned was Rs. 369.96 crore which increased to Rs.442.09 crore in the year 2000-2001.

The state has the large tribal population along with the substantial population of marginal farmers and landless labourers whose dependence on forest for employment, small timber, fuel, fodder and food is an acknowledged fact. The cattle population of the state is largely dependent on forest for grazing. Large fuel wood removal and heavy grazing (even by hoards from neighbouring states like Rajasthan, Gujarat) caused denudation of forests, seriously affecting their renewability and productive capacity.

2.18.5.1 Eighth Five Year Plan

2.18.5.1.1 Outlay and expenditure

The outlay envisaged for forestry sector in the eighth plan at constant price of 1991-92 was Rs.19,002 lakhs. During the year 1992-93, 1993-94, 1994-95, 1995-96 and 1996-97 expenditure incurred was Rs.3,665 lakhs, Rs. 4,367 lakhs, Rs.4,264.65 lakhs, Rs. 5,422.62 lakhs and Rs.6,664 lakhs respectively.

2.18.5.2 Ninth Five Year Plan

The activities of the forestry sector mainly related to forest conservation, preservation, scientific management and development through various afforestation programmes.

2.18.5.2.1 Strategies

The strategies proposed for the ninth plan were :-

1. To give highest priority to protect and preserve the existing forest.
2. To adopt holistic approach in forestry planning and identification of Forest Development Programmes.

3. To integrate the modern technology and concepts in the forest planning, project formulation, monitoring and evaluation with application of remote sensing techniques.
4. To integrate forest development programmes particularly in the field of watershed development, rehabilitation of degraded forests, fuel wood plantation and pasture development with programmes of animal husbandry and dairy development.
5. To lay emphasis on soil and moisture conservation through watershed projects based on integrated approach in afforestation and regeneration activities.
6. To suitably expand the research activities specially in the spheres of applied forestry.
7. To conduct refresher courses, organise field visits, regional seminars for in-service personnel in order to acquaint them with recent advances made in the forestry sector.
8. To evolve suitable package and work norms for various plantation programmes in different agro-climatic zones.
9. To strive for composite development of forest villages.
10. To evolve most acceptable and practical grazing control regulations, specially in regeneration areas with ultimate objective of doing away with fencing or like operation.
11. To undertake all round development of existing national parks and game sanctuaries.

2.18.5.2.2 Outlay and expenditure

To implement the content of various objectives as stated above, the approved outlay for the ninth plan was Rs.44,943.00 lakhs. The year wise expenditure incurred during first four years of ninth plan in 1997-98 Rs.11,437.80 lakhs + Rs.21.46 lakhs,1998-99 Rs.12,231.98 + Rs.75.10 lakhs, 1999-2000 Rs.13,227.25 lakhs + Rs.62.34 lakhs and 2000-01 Rs.3,091.57 lakhs + Rs.91.28 lakhs for Forest Development and Soil Conservation.

2.18.5.2.3 Physical target and achievement

Regarding physical performance the table below shows the important details (Table 2.31)

Table 2.31 Physical target and achievement of forestry during ninth plan

S. No.	Item	Unit	Ninth Plan	
			Target	Achievement
1	Rehabilitation of degraded forest including bamboo forest	Hectare	1,28,727	72,653
2	High technique plantation	Hectare	644	640
3	Plantation on encroached land	Hectare	20,000	18,000
4	Fuel/ fodder programme	Hectare	49,382	42,636
5	Establishment of Forests Posts	Number	15	15
6	Soil and water conservation	Hectare	2,512	1,035
7	M.P. Forest Project	Hectare	1,13,214	1,53,530

2.18.5.3 Tenth Five Year Plan and Annual Plan 2002-2003

2.18.5.3.1 Constraints in forestry development

The problems and constraints in forestry development include :-

1. Lack of awareness about multiple roles and benefits of forests, especially its role in drought proofing and prevention of soil and water run-off.
2. Inadequate linkage between management and livelihood security of the people.
3. Low level of technology
4. Inadequate research and extension
5. Weak planning capability
6. Wastage in harvesting and processing
7. Market imperfections
8. Over emphasis on government involvement and control
9. Low level of people's participation
10. Unwanted restrictions on felling, transport and marketing of forest produce grown by the people.
11. Lack of inter- sectoral coordination and weakness and conflicting roles of public forest administration.

2.18.5.3.2 Thrust areas identified for the development of forestry

To plug such constraints, the thrust areas identified for the development of forestry sector during tenth plan period are:-

1. Implementing all the prescriptions as prescribed under various working plans and micro plans.
2. Empowering both Joint Forest Management Committees (JFMCs) and staff of the forest department for holistic development of forestry sector.
3. Application of modern advanced electronic media for efficient management of forestry affairs.
4. Emphasis on development of forest villages and villages within the five kms of forest boundaries with the help of other concerned departments.

2.18.5.3.3 Outlay

The outlay envisaged for the tenth plan for forestry sector is Rs.35,720.00 lakhs, while for annual plan, 2002-2003 is Rs.7,144.00 lakhs. These outlays include provision for soil and water conservation.

2.18.5.3.4 Physical performance of forestry sector

The physical details for the forestry sector during tenth plan and annual plan, 2002-2003 are given below (Table 2.32).

Table 2.32 Physical performance of forestry sector during tenth plan and annual plan 2002- 2003

S. No.	Item	Unit	Tenth Plan 2002-2007	Annual 2002-2003
1	Rural Fuel Wood Plantation	Hectare	6,000	1,200
2	Area oriented fuel and fodder project	Hectare	27,000	5,400
3	Rehabilitation of degraded forest	Hectare	4,17,000	83,400
4	Soil and Water Conservation	Hectare	10,000	2,000
5	Compensatory Afforestation	Hectare	75,000	25,000
6	Hightech Afforestation	Hectare	6,100	1,220
7	Forest Dev. Cess	Hectare	93,750	18,750

2.19 Agricultural Development Scenario of the state

Agriculture and allied sectors occupy an important place in the economy of Madhya Pradesh. This is evident from the fact that about 75 per cent of its population lives in villages and is directly or indirectly dependent on agriculture and allied sectors for its livelihood. The population growth rate of the state during 1981-1991 was 27.24 per cent. It was 24.34 per cent during 1991- 2001. But when we compare this figure to the national figure it was above the national figure. The population growth rate for the country was 23.86 per cent during 1981-91 and 21.34 per cent during 1991-2001 (Table 2.33).

Table 2.33 Population Growth rate (2001) Provisional

States	Persons	Males	Females	Percentage decadal Growth	
				1981-91	1991-2001
India	1,02,70,15,247	53,12,77,078	49,57,38,169	23.86	21.34
M.P.	6,03,85,118	3,14,56,873	2,89,28,245	27.24	24.34

The share of agriculture in Gross State Domestic product during 1999-2000 at current prices was 29.4 per cent (Table 2.34) and 78 per cent of its working force was directly engaged in agriculture. Thus, agriculture is the core sector of the state's economy. Agriculture in the state is characterised by the problem of wide year to year fluctuations in production and hence in farm income. The absence of assured irrigation in most of the areas of the state and the lack of appropriate technology for dryland and drought prone areas further compounded the problem. However, despite its vulnerability to weather-induced risk

and uncertainty, the state agriculture made important contributions to the national basket of foodgrains, pulses and oilseeds. In 1999-2000, the state made the highest contribution of 25.3 per cent and 27.5 per cent to the total production of pulses and oilseeds, respectively in India. The state is also the third largest contributor of foodgrains. Its share in the country's total production is nearly 8 per cent.

Table 2.34 Share of Agriculture in Gross State Domestic Product during 1999-2000 (At Current Prices)
(Rs. In crores)

State	Agriculture SDP	Percentage share of Agriculture SDP to GSDP
M.P.	29,207	29.4

Despite general improvement in food availability, hunger and malnutrition still exist in some form or the other in almost every part of the state. According to an estimate, over 45 per cent people in rural areas and 40 per cent in urban areas of Madhya Pradesh lived below the poverty line in 1991. This figure was 37.06 per cent and 38.44 per cent respectively for rural and urban areas of the state in 1999-2000 (Table 2.35).

Table 2.35 Population below poverty line (BPL) 1999-2000

State	Rural		Urban		Combined	
	No. of persons (Lakhs)	Percentage of persons	No. of persons (Lakhs)	Percentage of persons	No. of persons (Lakhs)	Percentage of persons
India	1,932.43	27.09	670.07	23.62	2,602.50	26.10
M.P.	217.32	37.06	81.22	38.44	298.54	37.43

Therefore, removing hunger and malnutrition should form the core strategy for agriculture and rural development in the state.

Whereas the State has achieved reasonably good results in achieving high levels of productivity in irrigated agriculture, overall performance of agriculture has been less than satisfactory due to the low productivity in the non- irrigated tracts including most of the tribal districts in the state.

The agriculture in the state is characterised by low crop yields and high year to year fluctuations, which result in low and fluctuating farm production and farm incomes. In view of this, there is a need for developing appropriate crop varieties and technologies for dry land areas to increase the yield rates and reduce the yield variability. There is also need for diversification of crop farming through developing appropriate agro forestry and horticultural crops systems for areas that are at present wastelands.

Special emphasis needs to be placed on harvesting and storing rain water through construction of water harvesting structures in the state. What is needed is a series of small check dams on small rivers and rivulets. This approach would provide much needed protective irrigation and also will help reduce fluctuations in agricultural production due to erratic monsoon. There is urgent need to formulate an appropriate state water policy providing for conjunctive use of surface water and groundwater and for promoting water users' associations for ensuring judicious use of water and collection of water charges. It needs to be expanded to all potentially suitable areas in the state.

The important reservoirs in the state are Gandhisagar, Tawa and Bargi. The catchment area of these reservoirs is 23,140 sq.km., 5,983 sq.km. and 14,556 sq.km. respectively. The live capacity of these reservoirs is 11.873 billion cubic metres against the All India capacity of 130.553 billion cubic metres (Table 2.36).

Table 2.36 Status of important Reservoirs and Areas Benefitted during 2000-2001, Madhya Pradesh

(Capacity in Billion Cubic Metres)

S. No.	Reservoir	Catchment Area (Km^2)	Districts/ Area Benefitted	Live capacity at full reservoir level
1	Gandhi Sagar	23,140	Bundi, Tonk, Sawaimadhopur, Kota	6.827
2	Tawa	5,983	Hoshangabad	1.944
3	Bargi	14,556	Jabalpur, Narsinghpur	3.102
Madhya Pradesh				11.873
All India				130.553

Source : Central Water Commission, New Delhi

The total consumption of fertilisers in the state during 1999-2000 was 46.08 kg./ha. At the national level, the consumption of fertilisers was 94.72 kg./ha. It shows that the state is far behind in the consumption of fertilisers (Table 2.37).

Table 2.37 Consumption of fertiliser per hectare during 1999-2000

(Unit – Kg./ Hectare)

State	N	P	K	Total
Madhya Pradesh	26.54	16.98	2.56	46.08
All India	60.77	25.15	8.80	94.72

In 1999-2000, the total consumption of electricity in the state was 23,211 million KWH, of which 10,105 million KWH was consumed for agricultural purposes or 43.54 per cent. At national level, the consumption of electricity for agricultural purposes was 29.13 per cent. On the basis of this, we can say that the provision of electricity for agricultural purposes is better in the state as compared to the national level (Table 2.38).

Table 2.38 Consumption of Electricity for Agricultural Purposes (1999-2000)

(Unit – Million KWH)

State	Consumption for Agricultural purposes	Total Consumption	Percentage share of consumption for agricultural purposes
Madhya Pradesh	10,105	23,211	43.54
All India	90,186	3,09,620	29.13

Majority of the farmers in the state are small, poor and belong to SC/ST groups. These people have very small savings or do not have any savings and can not afford to make the needed investment in agriculture. To assist such people, it is necessary to organise them into self help groups (SHGs) and link the groups to the banks. This seems to be the best strategy for meeting their credit needs.

There is urgent need to speed up both the level and pace of agricultural development in the state. In particular, there is need for generation of improved dry land agriculture technology, diversification of agriculture, judicious use of groundwater and surface water, strengthening of extension and education programmes, enhancing the role of women in agriculture and their empowerment, training in human resource skills of agricultural extension personnel and improvement in the basic infrastructure and input delivery system. For this, a new vision and an appropriate agricultural policy framework is needed to be developed.

2.20 Development pattern of Crop Economy in the State (Planwise)

The cropping pattern of the state in different five year plans showed it was food crops oriented. Paddy and wheat dominated the cropping pattern of the state. Soybean was introduced in the state during mid-sixties and has become one of the major crops of the state. In terms of acreage, gram was the next important crop. These four crops, viz. paddy, wheat, soybean and gram accounted for major portion of the gross cropped area of the state. The figures mentioned in table 2.39 showed that the paddy area was increasing from plan to plan. The area of paddy in 1956-57 was 38.92 lakh hectares which increased to 56.04 lakh hectares in 1999-2000 showing 43.99 per cent increase in the area between two periods. The area under wheat increased from 32.41 lakh hectares (1956-57) to 47.55 lakh hectares (1999-2000) showing 46.71 per cent increase in area. As compared to wheat and paddy, the area under maize was very low. The area under maize in 1956-57 was 4.31 lakh hectares which rose to 8.96 lakh hectares in 1999-2000 and showed 107.89 per cent increase. The area under gram increased from 15.42 lakh hectares to 27.48 lakh hectares during the same period

showing 78.71 per cent increase. Soybean was introduced in the state during mid sixties. The area under soybean was 0.09 lakh hectares in 1965-66 which rose to 44.58 lakh hectares in 1999-2000 showing 34,192 times increase in the area. Although, the area under fruits, vegetables and spices was very small, but it showed the increasing trend during different plan periods. Fruits, vegetables and spices indicated 143.00, 334.54 and 162.39 per cent increase in the area respectively during the same period. Jowar and cotton showed the decreasing trend in area. There was 59.06 per cent decrease in the area of jowar, whereas, cotton showed 36.85 per cent decrease in area (Table 2.39).

Table 2.39 Area under crops at the end of different five year plans of Madhya Pradesh

(Unit- Lakh hectare)

	1956-57	End of second plan (1960-61)	End of third plan (1965-66)	End of fourth plan (1973-74)	End of fifth plan (1978-79)	End of sixth plan (1984-85)	End of seventh plan (1989-90)	End of eighth plan (1996-97)	Old M.P.	Percentage change in the ninth plan over 1956-57
									End of ninth plan (1999-2000)	
Rice (Paddy)	38.92	41.20	41.75	45.44	48.21	49.57	50.05	53.96	56.04	43.99
Wheat	32.41	30.89	23.95	32.73	37.78	35.98	32.84	43.27	47.55	46.71
Jowar	16.44	21.01	20.54	20.37	18.65	19.09	17.48	9.22	6.73	- 59.06
Maize	4.31	4.70	5.77	6.24	7.02	8.50	8.79	8.47	8.96	107.89
Total Cereals	110.45	115.80	109.07	125.12	130.95	130.23	124.39	126.40	130.82	18.44
Gram	15.42	14.93	15.98	18.51	17.38	20.76	21.57	25.13	27.48	78.21
Total pulses	36.22	37.48	37.42	47.71	45.42	48.44	45.43	50.26	51.68	42.68
Total food grains	146.67	153.28	146.49	172.83	176.37	178.67	169.82	176.66	182.50	24.43
Soybean	---	---	0.09	0.13	1.99	9.87	18.78	41.66	44.58	34,192.00
Other oilseeds	---	---	17.78	21.49	19.51	17.81	17.78	17.95	16.70	- 6.07
Total oilseeds	17.58	17.13	17.82	21.62	21.50	27.68	36.56	59.61	61.28	248.58
Cotton	7.68	7.66	8.55	6.00	6.75	5.25	5.77	5.20	4.85	- 36.85
Sugarcane	0.53	0.50	0.78	0.67	0.48	0.37	0.31	0.72	0.82	54.72
Fruits	0.35	0.37	0.44	0.46	0.51	0.53	0.62	0.60	0.85	143.00
Vegetables	0.55	0.67	0.75	0.95	1.10	1.31	1.43	2.03	2.39	334.54
Spices	1.17	1.09	0.88	1.04	1.41	1.52	1.70	2.62	3.07	162.39

2.21 Production of Crops in Different Plan Periods

The production of paddy and wheat showed an increasing trend during different plan periods. The rate of increase in the production of wheat was higher than the paddy. The production of paddy increased from 33.16 lakh tonnes (1956-57) to 68.05 lakh tonnes (1999-2000) showing 105.22 per cent increase during two periods. In the case of wheat, the production increased from 17.30 lakh tonnes to 87.76 lakh tonnes during the same period

indicating 407.28 per cent increase. The production of maize increased from 1.91 lakh tonnes to 14.25 lakh tonnes; or 646.07 per cent increase. The production of total cereals increased from 69.51 lakh tonnes to 180.32 lakh tonnes, 159.41 per cent increase. Among pulses, the production of gram showed 163.45 per cent increase during two periods. Total pulses showed 142.89 per cent increase over 1956-57. Similarly, total foodgrains production increased from 85.76 lakh tonnes (1956-57) to 219.79 lakh tonnes (1999-2000) or 156.28 per cent increase. Among cereals, the production of jowar decreased from 10.99 lakh tonnes (1956-57) to 5.36 lakh tonnes (1999-2000) or the decrease of 51.23 per cent (Table 2.40).

Table 2.40 Level of production at the end of different five year plans of Madhya Pradesh

(Unit – Lakh tonnes)

Crops/ Crop Groups	1956-57	End of second plan (1960-61)	End of third plan (1965-66)	End of fourth plan (1973-74)	End of fifth plan (1978-79)	End of sixth plan (1984-85)	End of seventh plan (1989-90)	End of eighth plan (1996-97)	End of ninth plan (1999-2000)	Percentage change in the ninth plan over 1956-57
Rice (Paddy)	33.16	34.49	16.94	36.47	35.62	37.61	44.92	59.79	68.05	105.22
Wheat	17.30	19.51	13.27	25.39	35.23	39.35	41.20	77.95	87.76	407.28
Jowar	10.99	14.76	13.12	11.77	12.80	15.20	17.37	7.84	5.36	- 51.23
Maize	1.91	5.34	4.78	4.32	5.99	11.61	14.58	9.48	14.25	646.07
Total Cereals	69.51	79.81	52.94	85.72	96.05	109.51	123.41	159.93	180.32	159.41
Gram	10.07	8.60	8.47	10.56	10.32	13.03	14.27	22.94	26.53	163.45
Total pulses	16.25	18.02	15.03	20.68	20.36	23.43	25.05	35.46	39.47	142.89
Total food grains	85.76	97.83	67.97	106.40	116.41	132.95	148.46	195.40	219.79	156.28
Soybean	---	---	---	0.06	0.87	7.70	14.96	39.40	47.56	79,166.00
Other oilseeds	---	---	4.82	6.45	5.54	6.08	8.57	11.60	11.38	136.09
Total oilseeds	4.83	5.21	4.83	6.51	6.41	13.78	23.53	51.00	58.94	1,120.30
Cotton (Lakh Bales)	5.62	4.48	3.11	1.69	2.97	2.69	4.12	4.24	4.17	- 25.80
Sugarcane (Gur)	1.70	1.36	1.85	1.52	1.79	1.39	1.37	1.76	1.99	17.06

2.22 Productivity of Crops in Different Plan Periods

In the case of cereals, highest increase in yield was observed in wheat (260.60 per cent) followed by maize (238.60 per cent), paddy (41.54 per cent) and jowar (17.06 per cent) during two periods i.e. 1956-57 and 1999-2000. The yield of gram increased from 655 kg./ha (1956-57) to 965 kg./ha. (1999-2000) showing an increase of 47.33 per cent. The yield of soybean increased from 265 kg./ha to 1,067 kg./ha, 302.64 per cent increase. The yield of cotton increased by 11.62 per cent during the same period (Table 2.41).

Table 2.41 Yields of different crops in various five year plans of Madhya Pradesh

(Unit – Lakh hectare)

Crop/ Crop groups	1956-57	End of second plan (1960-61)	End of third plan (1965-66)	End of fourth plan (1973-74)	End of fifth plan (1978-79)	End of sixth plan (1984-85)	End of seventh plan (1989-90)	End of eighth plan (1996-97)	Old M.P. End of ninth plan (1999-2000)	Percentage change in the ninth plan over 1956-57
Rice (Paddy)	898	881	427	849	781	802	944	1,167	1,271	41.54
Wheat	533	658	577	809	973	1,141	1,309	1,879	1,922	260.60
Jowar	668	703	730	581	689	798	994	858	782	17.06
Maize	443	1,170	925	700	862	1,379	1,674	1,129	1,500	238.60
Gram	655	576	530	571	594	628	662	914	965	47.33
Soybean	---	---	265	444	437	780	797	946	1,067	302.64
Cotton	396	306	221	154	227	268	363	418	442	11.62

2.23 Livestock in Madhya Pradesh

According to 1972 census, the number of total livestock in the state was 39,989 thousands. Of this the percentage of cattle was 66.17 followed by goat (15.42), buffaloes (14.49), sheep (2.52), pig (0.86), horses & ponies (0.37) and camel (0.03). In 1987, of the total livestock (43,282 thousand), the number of cattle was 62.24 per cent followed by goat (17.09 per cent), buffalo (16.78 per cent), sheep (2.11 per cent), pig (1.39 per cent), horses & ponies (0.22 per cent) and others (0.17 per cent). In 1999-2000, the number of total livestock was 32,214 thousand. Of this, the number of cattle was 56.85 per cent and buffaloes, 19.83 per cent. Other livestock constituted 23.32 per cent. When we compare the figures of these three periods, we find that the number of cattle in total livestock showed decreasing trend, whereas, in the case of buffaloes it was increasing. In the case of poultry, the number of birds was 6,701 thousand in 1972. It increased to 8,424 thousand in 1987 and increased to 8,480 thousand in 1999-2000 (Table 2.42).

Table 2.42 Livestock in Madhya Pradesh

(In thousand)

S. No	Particulars	Census 1972		Census 1987		Census 1999-2000 (New M.P.)	
1	Cattle	26,461	(66.17)	26,939	(62.24)	18,315	(56.85)
2	Buffaloes	5,795	(14.49)	7,262	(16.78)	6,387	(19.83)
3	Sheep	1,009	(2.52)	912	(2.11)	N.A.	N.A.
4	Goat	6,167	(15.42)	7,398	(17.09)	N.A.	N.A.
5	Horse & Pony	148	(0.37)	97	(0.22)	N.A.	N.A.
6	Pig	343	(0.86)	600	(1.39)	N.A.	N.A.
7	Camel	14	(0.03)	---	---	N.A.	N.A.
8	Others	52	(0.13)	73	(0.17)	7,512	(23.32)
9	Total livestock	39,989	(100.00)	43282	(100.00)	32,214	(100.00)
10	Poultry	6,701	---	8,424	---	8,480	---

Source : Commissioner Land Records, M.P.

Note : Figures in parentheses showed percentage to total livestock

2.23.1 Production of Milk, Eggs, Wool and Fish in Madhya Pradesh

The production of milk in the state in 1998-99 was 5,442 thousand tonnes which was 7.24 per cent of the national milk production of 75,184 thousand tonnes. The production of eggs was 14,001 lakhs, which was 4.75 per cent of the all India egg production. The wool production in the state during 1998-99 was 816 thousand kgs. The figure for all India was 48,326 thousand kg. The percentage of wool production in M.P. was 1.69. In M.P., marine fish production was nil due to absence of sea coast. Only Inland fish production was practised. In 1998-99, inland fish production in the state was 48,844 tonnes, which was 1.72 per cent of the total inland fish production of the country. In the state, total fish production was 0.86 per cent of the total fish production of the country (Table 2.43).

Table 2.43 Production of milk, eggs and wool and fish (1998-99)

State	Milk ('000 tonnes)	Eggs (lakh Nos.)	Wool ('000 kgs.)	Fish (tonnes)		
				Marine	Inland	Total
Madhya Pradesh	5,442 (7.24)	14,001 (4.75)	816 (1.69)	---	48,844 (1.72)	48,844 (0.86)
All India	75,184 (100.00)	2,94,756 (100.00)	48,326 (100.00)	28,10,510 (100.00)	28,45,832 (100.00)	56,56,342 (100.00)

Source : Agricultural Statistics at a glance- 2001, Govt. of India

2.23.2 Position of Livestock, Milk production, Milk availability and Milk processing in Madhya Pradesh

The population of crossbred cattle in M.P. in 1987 was 108 thousand, of which the proportion of male was31.48 per cent and female was 68.52 per cent. In 1992 the number of crossbred cattle was 208 thousand. The proportion of male was 30.77 and female, 69.23 per cent. The milk production in the state in 1971-72 was 11.70 lakh tonnes, which increased to 53.78 lakh tonnes in the year 1997-98 showing 360 per cent increase in the production during two periods. The percentage of state share in Indian milk production was 5.20 in 1971-72 and 7.61 in 1997-98. The number of crossbred cattle milch animals in 1992 was 87 thousand. Of this 67.82 per cent cattle was in milk and 32.18 per cent was dry. The total number of indigenous milch cattle was 8,429 thousand of which 49.18 per cent cattle was in milk and 50.82 per cent was dry. The number of milch buffalo in the state in 1992 was 3,448 thousand. About 61 per cent buffalo was in milk and 39 per cent was dry.

The per capita availability of milk in the state was about 196 gm./day in 1997-98 and the figure for the country was 204 gm/day in that year. The per capita availability of milk in M.P. and India was far below if we compare it to Punjab & Haryana. In these two states, the per capita availability of milk was 880 gm. And 600 gm/day respectively.

The milk processing units in the state in 2001 under cooperative sector was 10 with a capacity of 1,250 thousand tonnes. Under private sector the number of processing units was 4 with a capacity of 950 thousand tonnes. In the state, a total 16 processing units were in existence. The total capacity of these units was 2,220 thousand tonnes.

The milk processing capacity in the state was 834.61 thousand tonnes. The percentage of processing capacity to total milk production in the state during 2001 was 14.49. (Table 2.44)

Table 2.44 Position of livestock and milk production in Madhya Pradesh

S.No.	Particulars			Year	Male	Female	Total
1	Crossbred cattle Population ('000 No.)			1987	34 (31.48)	74 (68.52)	108 (100.00)
				1992	64 (30.77)	144 (69.23)	208 (100.00)
2	Milk Production (Lakh MT)			1971-72	11.70		
				1981-82	23.90		
				1991-92	47.90		
				1995-96	51.25		
				1996-97	52.24		
				1997-98	53.78		
3	Percentage of state share of Indian Milk Production (%)			1971-72	5.20		
				1981-82	6.97		
				1991-92	8.58		
				1995-96	7.74		
				1996-97	7.56		
				1997-98	7.61		
4	Number of Milch animals ('000 No.) Year 1992	Cattle (Cross Bread)		Cattle (Indigenous)		Buffaloes	
		In Milk	59 (67.82)	4145	(49.18)	2088	(60.56)
		Dry	28 (32.18)	4284	(50.82)	1360	(39.44)
		Total	87 (100.0)	8429	(100.00)	3448	(100.00)
5	Per capita availability of Milk (gm/day)	Year	M.P.		India	Highest in	
		1993-94	195		188	Punjab - 880	
		1994-95	199		191	Haryana- 600	
		1995-96	199		197	(1997-98)	
		1996-97	193		202		
		1997-98	196		204		

6.	Milk processing capacities created in the state (March 2001) ('000 tonnes)								Milk processing capacity ('000 tonnes)	Percentage processing capacity to milk production
Cooperative Sector		**Private Sector**		**Others**		**Total**				
Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity			
10	1250	04	950	02	20	16	2220		834.61	14.49

Source : Basic Animal Husbandry Statistics 1999, Department of Animal Husbandry and Dairying, Ministry of Agriculture, Govt. of India, New Delhi.

2.24 Public Investment in Agriculture

The slow pace of growth of agricultural economy and its impact can be partly explained by low investments in agriculture in the state. Investment in agriculture whether public or private is important part of growth process and is, therefore, an important resource. The gross capital formation in agriculture has been declining in both public and private sectors over time. This trend is likely to adversely influence the growth process in agriculture. During the period 1974-75 to 1996-97, capital expenditure on agriculture in the state was one of the lowest in India. Its capital expenditure per hectare was highest at Rs.117 during the 6th plan (1980-81 to 1984-85) and since then the state has been spending lesser and lesser resources on farm infrastructure which was as low as Rs.65 per hectare during the 8th plan (1992-93 to 1996-97) against the all India average of Rs.188. During the same period, the state capital expenditure also declined from 8.17 per cent of net state domestic product to 3.41 per cent as compared to the all India average of 5.4 per cent. On the other hand, the private investment in M.P., which is mainly used for assets formation and their improvement, was closer or even higher than the national average. The estimates of fixed capital formation in agriculture between the period, 1981-82 to 1991-92, indicate that M.P. recorded the highest growth in fixed capital formation in agriculture during this period, when per hectare investment increased from Rs.51 in 1981-82 to Rs.138 in 1991-92.

The other dimension of this issue is the low returns from these investments which is reflected in the analysis of incremental capital output ratio. It is believed that the public investments in agriculture had a very narrow focus mainly on irrigation but other infrastructure components like roads, markets, rural electrification etc. were neglected. An all India comparison suggests that in M.P. the efficiency of capital use has been poor to moderate between 5th plan and to 8th plan. In the states like M.P., improvement in capital use efficiency in agriculture should be accorded the highest priority through judicious use of investment resource.

2.25 Capital formation in agriculture

The gross fixed capital formation (GFCF) in Madhya Pradesh at current prices increased from Rs 10,578.52 crores in 1993-94 to Rs 16,298.54 crores in 1998-99, and further to Rs.17,564.61 crores in 1999-2000. Thus, there has been a continuous increase in gross fixed capital formation (more than one and a half times increase) during the seven

years. The percentage of gross fixed capital formation to gross state domestic product at current prices (1993-94) declined from 20.05 in 1993-94 to 17.96 in 1998-99 and further to 18.61 in 1999-2000.(See graph)and Annexure-1.

In absolute terms GFCF in both the public and private sectors increased, but while the relative share of the public sector declined from 33.26 per cent in 1993-94 to 28.26 per cent in 1998-99, and further to 28.05 per cent in 1999-2000, the share of private sector increased from 66.74 per cent in 1993-94 to 71.74 per cent in 1998-99, and further to 71.95 per cent in 1999-2000.

Gross fixed capital formation in all the major sectors of the economy increased during 1993-94 to 1999-2000. But in relative terms the contribution of the primary sector agriculture, forestry and logging, fishing and mining & quarrying) increased from 17.44 per cent (1993-94) to 18.77 per cent (1999-2000). The contribution of agriculture (including livestock) increased from 14.89 per cent in 1993-94 to 15.23 per cent in 1999-2000 (Table 2.45).

Agriculture (including livestock)

For estimation of gross fixed capital formation the entire sector is divided into public and private sectors. Public sector has been further split into Central Government and State Government. The capital expenditure of the public sector for agricultural activities, such as improvement of land and irrigation works, flood control projects, laying of new orchards and plantations, purchase of agricultural machinery and implements are culled out from the budget documents of the State Government. For the Central Government non-departmental enterprises information on GFCF is obtained from concerned units operating in the state. The capital expenditure of the private sector for agricultural activities is covered under the following heads :

1) Reclamation of land.
2) Bunding and other land improvements.
3) Orchards and plantations.
4) Wells
5) Other irrigation sources.
6) Agricultural implements, machinery, transport, equipment, etc.
7) Farm houses, barns, animal sheds, etc. and others.

It is clear from the table no.2.45 that the share of GCFA in GSDP has come down to 2.83 per cent in 1999-2000 (at 1993-94 prices) from 2.98 per cent in 1993-94. The public sector real investment in agriculture has been continuously yielding its ground to private investment. Its share in total investment has been declining. Its share in investment in agriculture has been falling steadily from 25.33 per cent in 1993-94 to 20.10 per cent in 1999-2000. The increasing dominance of private investment in agriculture clearly points towards worsening of income distribution patterns in the rural society. Its share in investment in agriculture has increased from 74.67 per cent in 1993-94 to 79.90 per cent in 1999-2000. This type of trend clearly implies diversion of public sector resources in the form of subsidies for fertilizers, rural electricity, irrigation, credit supply and other agricultural inputs. However, this trend should be reversed so as to accelerate the agricultural growth by giving more emphasis on creation of assets rather than on giving more subsidies. The enhanced investment in private sector in agriculture should be properly tapped for creating necessary infrastructure, conducting research and rural communications.

Table 2.45 Capital Formation in Agriculture in Madhya Pradesh

(Rs. in Crore)

Year	Gross Fixed Capital Formation(GFCF)			Gross Fixed Capital Formation in Agriculture			Gross State Domestic Product GSDP	Percentage of Colm.5,6,7 to col. 2,3,4 respectively			Share of GCFA(5) in total GSDP(8)
	Total	Public sector	Private sector	Total	Public sector	Private sector		Total	Public sector	Private sector	
1	2	3	4	5	6	7	8	9	10	11	12
1993-94	10578 (100)	3518 (33.26)	7060 (66.74)	1575 (100)	399 (25.33)	1176 (74.67)	52752	14.89	11.34	16.65	2.98
1994-95	14412 (100)	3858 (26.77)	10554 (73.23)	1788 (100)	410 (22.93)	1378 (77.07)	58611	12.41	10.63	13.06	3.05
1995-96	13210 (100)	3970 (30.05)	9240 (69.95)	1733 (100)	364 (21.00)	1369 (79.00)	65800	13.12	9.17	14.82	2.63
1996-97	13441 (100)	3858 (28.70)	9583 (71.30)	1959 (100)	422 (21.54)	1537 (78.46)	75345	14.58	10.94	16.04	2.60
1997-98	14412 (100)	3805 (26.40)	10607 (73.60)	2104 (100)	470 (22.34)	1634 (77.66)	81042	14.59	12.35	15.40	2.59
1998-99	16298 (100)	4606 (28.26)	11692 (71.74)	2399 (100)	508 (21.17)	1891 (78.83)	90737	14.72	11.03	16.18	2.64
1999-2000 (P)	17565 (100)	4927 (28.05)	12638 (71.95)	2676 (100)	538 (20.10)	2138 (79.90)	94384	15.23	10.92	16.92	2.83

Source : Estimates of Gross Fixed Capital Formation in Madhya Pradesh (1993-94 to 1999-2000) (New Series-Base year 1993-94), Directorate of Economics & statistics, Govt. of Madhya Pradesh, Bhopal

P = Provisional Estimate

Figures in brackets denote percentage to total.

CHAPTER - III

MAJOR INITIATIVES IN AGRICULTURAL DEVELOPMENT

The major initiatives in terms of schemes and programmes taken by the state government in the agricultural sector can be categorised into the following four groups.

1. Agricultural Production including crop husbandry and agricultural research and education.
2. Soil Conservation
3. Minor irrigation
4. Micro minor irrigation

The agricultural production programmes mainly consist of crop production, soil conservation (Watershed programme and river valley/ flood prone river project), minor irrigation (dugwells and tubewells and sprinklers) and micro minor irrigation (stop dams and irrigation tanks to cover upto 40 hectares). These heads are again categorised into nearly 60 plan and non-plan schemes which are either state or centrally sponsored. Besides these, a DANIDA assisted project called "MAPWA" for improving the role of women in agricultural field operations is also underway since 1993 in eight districts of the state.

3.1 Agricultural Production

Financial Provision for Xth Plan

(A)	**Crop Husbandry**	**-**	**Rs.62,566.00 Lakhs**
(B)	**Research and Education**	**-**	**Rs. 6,678.00 Lakhs**
	B1 For Development of Science & Technology	**-**	**Rs. 6, 653.00 Lakhs**
	B2 Grant in Aid to JNKVV Jabalpur	**-**	**Rs.25,000.00 Lakhs**

Schemes under Agricultural Production group mainly, aim to increase production and productivity of foodgrains (cereals/ pulses) oilseed, cotton and sugarcane crops through dissemination of latest technology to the cultivators. For this purpose schemes like Integrated Cereal Development Programme for Rice and Coarse Cereals, National Pulse Development Project, Oilseed Production Programme, Intensive Cotton Development Programme, Sugarcane Development Programmes, Maize Development Programme, Production of high yielding quality seeds are being implemented. Schemes for training and publicity along with Organic Farming, Integrated Pest Management, Biogas, National Crop Insurance are also accommodated in this group.

There is a separate Directorate for Horticultural and Agricultural Engineering in the state and schemes pertaining to horticulture and farm mechanization are accommodated in this group. Assistance given to Agriculture University for promoting Research & Education and financial provision for Danida aided project for women also finds place in the group.

3.2 Macro Management Programme

Through Macro Management programme 13 schemes of Agriculture and 9 schemes of Horticulture are being implemented. This programme was implemented from 1st January 2001. In this programme sharing of State and G.O.I. is 10:90 per cent. Under this programme all the schemes are proposed to continue in Xth FiveYear Plan 2002-03 to 2006-07.

3.3 Soil Conservation

Financial Provision for Xth Plan - Rs. 4,222 Lakhs

National Watershed Development Project for Rainfed Area (NWDPRA) was started in Madhya Pradesh during VIIIth five year plan in the year 1990-91 in all the 385 blocks having less than 30 per cent assured irrigated area.

Apart from this, salary of staff working in soil conservation programme, financial provision under Danida aided watershed development programme are also accommodated in this group.

3.4 Minor Irrigation

Financial Provision for Xth Plan - Rs. 4,000 Lakhs

With a view to develop the minor irrigation resources, a massive programme for tube wells is taken up. Liberal assistance is provided for sprinkler sets through centrally sponsored schemes. Since "Jeewan dhara" scheme of free dug wells is already there in Panchayat and Rural Development Department hence the scheme of Assistance for construction of new dug well has been discontinued w.e.f. 1st April 1999.

3.5 Micro Minor Irrigation

Financial Provision for Xth Plan - Rs. 4,146 Lakhs

Small tanks, percolation tanks and water harvesting structures are being constructed by the Department of Agriculture under Micro Minor Irrigation programme. Being solely a state sector programme there has been financial constraints and the programme could not be implemented as per required size.

This programme also helps for recharging of water level of wells and gives employment to village labourers and artizens.

Total financial provision for different schemes and programmes taken by the State Government for agricultural sector for the X^{th} plan (2002-2007) is Rs.81,612 lakhs.

3.6 Schemes Proposed to be Dropped in Tenth Plan

There are 29 schemes which are proposed to be dropped as given below :

1. Subsidy on dugwells
2. Grant in aid to Seed Certification and Supervisory Agencies
3. Schemes for giving incentive for farm yard manure (NADEP)
4. Development of Composit Agricultural Machinery unit,
5. Agricultural Development Programme
6. Soil Water Management Training Programme
7. Reclamation of Alkaline Soils
8. Strengthening of P.P. Scheme
9. Agricultural Development Project
10. Share Capital to M.P. Seed Corporation
11. Interest Subsidy to Cooperative Societies
12. Organic farming programme
13. Establishment of Pest and Survellance unit
14. Establishment of pesticide quality control laboratory
15. Farmers Training and Visit programme
16. Sisal Development Programme
17. Grant in aid to private agencies
18. Establishment of machine tractor station at Bastar.
19. Grant in aid to Agro Centre
20. Grant in aid to IGKVV.
21. Grant in aid to MPEB.
22. Scheme for Replacement of foot valves
23. Grant in aid to Land Development Corporation
24. Establishment of Soil Testing Laboratories at Betul, Rajgarh & Guna
25. Bhoj wet land project
26. Public sector undertaking (PSU)
27. Integrated Cereal Development Programme (Rice)
28. Integrated Cereal Development Programme (Coarse Cereal)
29. Sustainable Development of Sugarcane

3.7 Major Scheme wise details

3.7.1 Agricultural Production

3.7.1.1 Direction and Administration

Schemes under this group are meant to meet the expenditure on strengthening of Transfer of Technology, Extension project which was earlier aided by World Bank Externally and now implemented through state funds.

3.7.1.2 Agricultural Farms

The scheme is meant to meet the expenditure on development and provision of essential infrastructure of the 45 Agricultural farms with the Department of Agriculture.

3.7.1.3 Manures & Fertilisers

Under this group three schemes are included

1. National project on Biogas Development.
2. Fertiliser Quality Control programme.
3. Bio fertiliser programme.

3.7.1.4 National Biogas Development Project :

A programme for installation of bio-gas plants under National Programme of Bio-Gas Development is being implemented in the state with a view to provide alternative source of energy and organic manure through the bio-gas residual slurry.

From 1999-2000 subsidy is only provided by the Central Government to the beneficiaries. M.P. Agro Industries Corporation, M.P. Khadi Commission, M.P. Urja Vikas Nigam are nodal agencies to carry out the programme. This programme is implemented through Jila Panchayat and Janpad Panchayat alongwith department.

3.7.1.5 Plant Protection :

Efforts will be made to save the crops from attack of pests and diseases and other endemic attack of pests. Programme has also been proposed for field observation, aerial and ground operations in the event of pest attack in the endemic areas for which schemes like strengthening of P.P. schemes for endemic area scheme are to be continued in X^{th} plan period also.

3.7.1.6 Oilseed Production Programme

This Centrally Sponsored Scheme is operated in all the 45 districts of the state and covers soybean, groundnut, sesamum, niger, sunflower, and summer groundnut for increasing production and productivity. Cost sharing pattern by Government of India and State is 75:25.

The components of the scheme include subsidy on distribution of certified seed, seed minikits, seed treatment, integrated pest management (IPM) demonstrations, improved implements, sprinkler sets, bio-fertiliser and gypsum/pyrite on subsidised basis alongwith crop demonstrations and training programmes.

3.7.1.7 Sustainable Development of Sugarcane Programme

There are eight sugarcane factories working in the state namely at Sehore, Barlai (Indore), Kailaras, Burhanpur, Dabra, Jhabua (Badwani) Guna, Sarverdewla (Khargone). Four more factories namely at Narsinghpur, Hoshangabad, Khargone and Betul are likely to be established. Licence for factories at Narsinghpur, Khargone and Hoshangabad districts have been issued by Government of India.

The scheme is in operation with the object to increase the area, production and productivity of the sugarcane crop in the state through introduction of varieties and popularising the latest technology. Subsidy is provided on distribution of seed, seed treating medicines, transportation of seeds, biological control, inter-cropping, hand operated and power operated plant protection equipments and drip irrigation unit.

In view of increasing production and productivity of sugarcane crop thrust has been given to this programme. Centrally sponsored scheme for sustainable development of sugarcane is implemented from 1995-96 to 2000-01. Under Macro Management Plan sustainable development of sugarcane is being implemented with effect from 1.1.2001.

3.7.1.8 Suraj Dhara and Annapurna Scheme

This scheme has been implemented in whole state since 1993-94 and is operative in 10 major tribal districts. The main object of this scheme is to encourage the scheduled castes/ scheduled tribes farmers to provide the certified seeds, adopt cultivation of oilseeds and pulses replacing millet crop. The crops included are soybean, sunflower, sesamum, rapeseed and mustard, linseed, safflower, urad, gram, etc.

In this scheme three components are included.

(a) Seed Exchange programme
(b) Self Seed Sufficiency Programme
(c) Seed Production Programme

This scheme is implemented under special central assistance with 100 per cent Government of India assistance.

3.7.1.9 Intensive Cotton Development Programme (ICDP)

This scheme is in operation as Centrally Sponsored Scheme. The scheme has already been continuing in 13 districts (Chhindwara, Dhar, Khandwa, Khargone, Badwani, Jhabua, Mandsaur, Dewas, Ratlam, Shajapur, Betul, Harda, Sehore districts) of the state. The subsidy is proposed on certified seed of high yielding/ hybrid varieties (inclusive of 10 years old stock of such seed from the date of notification), field demonstrations, farmers training, extension workers training, seed delinting plant, distribution of sprinkler sets, drip irrigation system, Bio- Agent lab, surveillance of diseases and pests, IPM Demonstration cum Training, Distribution of pheromone Traps, Bio-Agent NPV, supply of plant protection sprayer/duster.

3.7.1.10 Training

This sub-group deals with various trainings of extension staff and farmers. Exchange visit programme of farmers and staff within and outside the state for 10 to 20 days. The group comprises of 10 to 20 staff or farmers. These visits are not only essential but are also very important to acquaint farmers as well staff with latest and modern and agricultural techniques.

Overall training programme comprises of training of staff, training of farmers, refresher courses, pre service foundation courses, skill development courses, etc. Special emphasis has also been laid to facilitate tribal farmers with special trainings and visits for which specifically four training centres viz. Betul, Waraseoni, Dindori and Satrati are being restrengthened along with other centres of the department.

As per the provisions made in the national and state training policy every effort is being concentrated to strengthen over all extension training programme in the state for which

the provision has been made in the Macro Management plan. A state level Agriculture Extension and Training Institute has also been establish shortly at Bhopal to facilitate the training of officers not only for Agriculture Department but also for all the line departments.

3.7.1.11 Training of Women and Youth Farmers under DANIDA Project

A large number of farming activities are mainly done by women. Women are also decision makers in many farming households. Yet farm women have little knowledge of improved agricultural practices. Hence providing training to farm women is essential. Government of Madhya Pradesh with 100% assistance of Danish Government is undertaking a programme for providing training and extension service to farm women was the objective of the MAPWA project. It is to improve the production on the small and marginal farms.

As per draft project report of "MADHYA PRADESH WOMEN IN AGRICULTURE PROJECT' M.A.P.W.A. an assistance of Rs. 624.22 lakhs is estimated to be available during the project period of Five Years. The project agreement has been signed in December, 1993 and implementation of programme has started with effect from 1994-95.

REVIEW CUM APPRAISAL MISSION RECOMMENDATIONS

The current GOMP agreement of MAPWA phase-1 expired on 18th November 2000. A final review-cum-appraisal was undertaken from 12th to 28th September 2000. The report was satisfactory and has recommended the extension of the current phase-I from 19th November 2000 to 18th November 2001 and is to continue into phase-II (November 2001 to November 2006).

Plan for the extended period of phase-I

For the period April to November, 2001 (extension period of phase-I, it has been decided to consolidate the MAPWA benefits in 18 blocks for intensive extension under the consolidation plan.

Plan for phase- II

In addition to the continuance of MAPWA activities in the old blocks of the existing 8 districts for susceptibility, new blocks in the existing districts will be operational for replication. It has been suggested by the Review Team to include 6 New districts in phase-II, so that a good resource base generated for the future.

It has been decided that the Phase-II will concentrate on the integration of the MAPWA project in the general extension system.

3.7.1.12 Crop Oriented Programmes

Main thrust under Crop Oriented Programmes during the year will be on the programme meant for enhancing the production of rice, wheat, cereals and pulses. Other important schemes like comprehensive Crop Insurance Programme also finds place in this group. Details are as follows :

3.7.1.12.1 Comprehensive Crop Insurance Programme

This scheme is being implemented in the State as per norms fixed by Government of India. The scheme envisages sharing the risk between the Government of India and the State in the ratio of 2:1. Farmer's availing loan facility from different banks in the defined areas are required to get insurance cover for notified crops, for which loan has been availed. Total loan is insured, subject to a maximum of Rs.10,000/- per farmer.

Premium @ 2% for cereals, and 1% for pulses and oilseed crops is charged against the sum insured. Premium and indemnity claims are shared by General Insurance Company and the State Government, in the ratio of 2:1. For small and marginal farmers premium is subsidised @ 50 per cent. Crop and area is notified by State Government before every crop season.

3.7.1.13 National Pulses Development Project

This Centrally Sponsored scheme with 25 per cent state's share is under operation in all the 45 districts of the state since 1986-87. All the 45 districts covering all major crops like arhar, moong, urd, lentil and pea are included for maximising production.

Subsidy is provided on the different components of the above subject. These components include seed minikits, block demonstrations, foundation and certified seed production, equipments, sprinkler sets, herbicides, weedicides, distribution of Gypsum/ pyrite, NPK distribution, IPM Demonstrations, farmers training, seed treatment with chemical, etc.

3.7.1.14 Agricultural Research and Education

With the expansion of training and visit system in the entire state, Research and Education Organisation of the Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur needs strengthening. Grant-in-aid to the University is provided under the sub-group.

3.7.1.14.1 Agricultural Engineering

For promotion of farm mechanisation in the state new equipments and machines are required for front-line demonstrations and custom hiring. In addition to this improved agricultural implements and small tractors are being distributed under Centrally Sponsored Scheme. More than one lakh improved implements and 700 small tractors are being distributed every year. As such during the fifth year plan, 5 lakhs implements and 4,000 small tractors have been distributed on subsidy. In addition to this about 30,000 implements are being manufactured in departmental workshops every year.

Following schemes are proposed to be continued in tenth five year plan.

3.7.1.14.2 Establishment of Agricultural Engineering Directorate

Drawal of pay and other allowances of the staff working against the posts sanctioned for this Directorate has been started since June, 1992. It is required to be continued in tenth five year plan.

3.7.1.14.3 Strengthening of Machine Tractor Station by Replacement of Old Machines, Strengthening of Machine Tractor Station.

There are 30 tractor units in the state through which machines and equipments are supplied to cultivators on custom hiring. These centres are required to be strengthened with new improved machines and equipments. In addition to this some of the tractors and equipments require replacement. Hence this scheme is proposed to be continued in tenth five year plan.

3.7.1.14.4 Training Programme for Employees

To cope up with the pace of farm mechanisation, it is essential to organise training programmes for employees in different institutions like Central Institutes like Central Institute of Agricultural Engineering (CIAE), Bhopal, Water and Land Management Institute, (WALMI), Bhopal, Central Institute of Plastic Engineering and Technology, Bhopal. In

addition to these training programmes employees have to be trained in information technology also. As such this scheme is introduced in 2000-01 and required to be continued in tenth five year plan.

3.7.1.15 National Crop Insurance Scheme

The National Crop Insurance Scheme is being implemented in the State as per the norms fixed by the Government of India w.e.f. rabi 1999-2000. The previously implemented comprehensive crop insurance scheme has been withdrawan from rabi 1999-2000. The name of new scheme is Rashtriya Krishi Bima Yojana (RKBY).

The objectives of the scheme are-

i) To provide insurance cover and financial support to the farmers in the event of failure of crops as a result of natural calamities, pests and diseases.

ii) To encourage farmers to adopt progressive farming practices, high value inputs and modern technology in agriculture.

iii) To help establish for income, particularly in disaster years.

iv) To support and stimulate production of food crops and oilseeds.

3.7.2 Macro Management Plan

To ease the funding process and provide more freedom to state governments for planning and implementation according to the need of the state, Govt. of India proposed that 13 Centrally Sponsored Schemes of Agriculture and Horticulture be merged under one broad umbrella of Macro Management Plan. This is also meant to remove dissimilarities of Govt. of India grant, loan and state share between schemes. Varying GOI and state share in different Centrally Sponsored schemes were brought to a constant sharing of 90:10 respectively. GOI share contributes 80 per cent grant and 20 per cent loan spread over a recovery period of 20 years (for first five years no recovery + 15 years recovery).

State Department of Agriculture, M.P. after considering its requirements prepared 22 schemes under Macro Management Plan. It included 13 schemes (8 continued + 5 new schemes) of Agriculture and 9 schemes of Horticulture. The schemes of Cooperative Department could not be included for some administrative reasons. Similarly, Land Use Board could not spend its prior allocation and therefore the scheme of Wasteland Development was not included in the work plan.

3.7.2.1 Integrated Cereal Development Programme (Rice)

To increase production and productivity of rice in all the 45 Districts of M.P., the following measures were proposed. These are popularisation of line sowing, replacement of upland paddy with suitable, sustainable crop, inclusion of hybrid rice cultivation, more emphasis on organic farming, integrated nutrient management and integrated pest management, discouraging farmers for summer cultivation of paddy, strengthening of training facilities to farmers and extension workers, use of electronic media and better utilisation of publicity system, premonsoon nursery raising in irrigated area, use of bio-fertilisers and increase in seed replacement rate.

3.7.2.2 Integrated Cereal Development Programme (Coarse Cereal)

To increase production and productivity of wheat, maize, jowar, bajra and kodo-kutki in all the 45 districts of Madhya Pradesh, the following measures were proposed. These are reorganisation of seed production and distribution system, greater emphasis on organic farming, Integrated Nutrient Management and Integrated Pest Management through demonstrations and strengthening of extension system, improvement in irrigation and water management system, strengthening of training facilities to farmers as well as to the extension workers, use of electronic media and better utilisation of publicity system.

3.7.2.3 Sustainable Development of Sugarcane

To increase area, production and productivity of sugarcane in the state, this programme will be implemented in 26 sugarcane growing districts of Madhya Pradesh. Financial support will be provided for seed production and distribution and popularisation of tissue culture planting material, propagation of intercropping, introduction of suitable farm implements, i.e. Cutter Planter, Rotavator, Power Tiller, Sets cutting machine, Stubble saver, Ridger, etc., training support and to popularise the use of parasites to control sugarcane insects and pests.

3.7.2.4 Balanced and Integrated Use of Fertilizers (BIUFs)

To promote the balanced and integrated use of fertilisers in the state the following measures were proposed. These are, to ensure effective quality control of fertilizers, to assess the availability of micronutrients in the soil, on the basis of analysis of micronutrient

availability in the soil adoption of promotional activities for application of micro-nutrient in the soil, and, strengthening of existing laboratories training programmes in all the districts.

3.7.2.5 Integrated Pest Management (IPM)

Checking of the indiscriminate use of pesticides which cause ecological and environmental degradation, Effective Quality Control of Pesticides and Insecticides. Promotion of Bio- pesticides and insecticides in all the 45 districts of the State, Promotion of IPM as State wide campaign, Re-structuring the training facilities to the extension workers and farmers for IPM.

3.7.2.6 National Watershed Development Programme for Rainfed Areas (NWDPRA)

National Watershed Development Project for Rainfed Areas is sponsored by Govt. of India. It was started in Madhya Pradesh during VIIIth Five Year Plan in the Year 1990-91 in all the 385 blocks having less than 30 per cent assured irrigated area. The total area of 385 selected watersheds was 8,52,753 ha. An area of 6,60,202 hectare was treated against the total treatable area of 7,49,641 hectare with an expenditure of Rs.129.42 crores in 43 districts of Madhya Pradesh covering 280 development blocks.

In each of these selected blocks one watershed of 500 to 5000 hectares has been taken up for integrated development of arable and non arable land, drainage line treatment and livestock management.

3.7.2.7 River Valley Project and Flood Prone River Scheme (RVP & FPRS)

The scheme envisaging erosion control in catchments of river valley projects has been in operation since the IIIrd plan period. The basic object of the scheme is to prevent excessive erosion in the watershed areas, prevention of land degradation by adoption of multi-disciplinary integrated approach in the catchment areas, improvement of land capability and moisture regime in the water sheds, promotion of land use to match land capability, prevention of soil loss from the catchments to reduce siltation in the reservoirs, people's involvement in the management of attachments, upgradation of skills in planning and execution of land development programmes in the catchment areas.

3.7.2.8 Promotion of Farm Machanisation

In Madhya Pradesh the growth of use of improved agricultural implements is less amongst small farmers. Further popularisation of power drawn equipments in the state is much less in comparison to other states. Farm power availability in the state is far below the national average.

To replace the convensional and traditional equipments and to discourage the use of timber in use of agricultural implements improved agricultural implements are distributed to small farmers on subsidy. The use of tractor, power tiller and other power drawn equipments reduce the physical labour and drudgery as well as losses in different agricultural operations. Further to encourage the efficient and judicious use of seeds and fertilisers and to complete different farm operations efficiently in comparatively less time with low investment, promotion of farm mechanisation is essential.

By using improved agricultural implements and equipments productivity can be increased by 10 to 15 per cent and it saves labour, time and money. The use of tractor and power tiller reduces man hours and enhances the power availability per hectare. Further accrual of additional income by custom hiring of tractors and high value equipments is also possible.

Previously the programme of the distribution of improved agricultural implements and hand tools, power operated improved agricultural equipments, power tiller and tractor were included under various schemes. Now for effective monitoring and implementation only one scheme under Macro Management “Promotion of Farm Mechanisation” is being operated since January 2001. In Tenth Five Year Plan post harvesting equipments are also being proposed to be subsidised. Therefore, this scheme is proposed to be continued in tenth five year plan.

3.7.2.9 Production of quality and high yielding seeds

Production and multiplication of High Yielding and quality seeds in sufficient quantity is needed for meeting the requirements of breeder, foundation and certified seeds. Infrastructural development of selected farms in every year right from the year 2000-01 and subsequently in 2001-2002 was done. Establishment of Revolving Fund. Production of seed, launching new programmes through Seed Village Scheme.

3.7.2.10 Development of Organic and Sustainable Agriculture (DOSA)

The basic object of this programme is to promote the use of bio-fertilizer, to promote green manuring practices among farmers to maintain humus and fertility in the soil, to educate farmers for use of biofertiliser, production of quality compost, Farm Yard Manure (FYM) and use of biomas for making compost and to popularize use of biogas slurry.

This scheme covers the entire state. To implement the scheme a compact area of 5-6 villages is being selected from each block. Priority will be given especially to those villages which were already selected under National Watershed Development Programme. One separate Deputy Director of Agriculture has been posted at Indore to carry out the programme.

3.7.2.11 Agriculture Extension Training and Publicity Support Programme :

The main object of this programme is to strengthen and re-organise Training and Extension system of the state. All 45 districts of Madhya Pradesh strengthening and up gradation of existing 19 Training Centres, preparation of extension and training material for effective delivery of extension messages, mobility of publicity and extension media, organization of Exhibitions and Krishak Sammelans for demonstration of latest technologies among farmers, equipping the new State Level Training Institute at Bhopal, exposure of extension workers and farmers to improve their skills by conducting study tours within and outside state, strengthening the existing departmental Printing Press at Bhopal for regular publication of programme promotional and training literature, strengthening of 7 Printing Presses at each of 7 Agro-Climatic Zonal Offices, use of electronic media including preparation of Video films and their display at block and village levels.

3.7.2.12 Development of Information Technology (DIT)

A database network AGRINET is proposed to be set up with the following features. Set up an integrated service for collection of grass-root level data, installation of Computer hardware, development of Software which can collect, analyses and disseminate information at district and state level, to ensure inter- organisation and intra- organisational connectivity. To establish a State Agriculture and Marketing Information Centre (SASMIC) with skilled personnel, publish data, reports and literature on subject connected with weather and crop conditions, Agriculture and Horticulture production, Stocking and supply of inputs,

market arrivals and prices etc. Assist participating agencies in taking-up special studies related to their sector. Ensure co-ordination with Commissioner Land Records (CLR), State Agricultural Universities and other state-wide systems as required. At all the 45 district of the state Connected through computers and software at state, zonal and district levels. Training to the persons on Information Technology for efficient management of the systems will be given and Up-dating of software, maintenance of hardware, Internet connectivity at every level are main components of this schemes.

3.7.2.13 Scheme for Augmentation of Ground Water

The main object of this programme is to augment ground water storage and control decline of water table, to improve ground water availability, to reduce surface runoff and soil erosion. Whole rainfed area of Madhya Pradesh will be covered by proposed new scheme. At present only 26 per cent of total cultivated area (255.80 lakh hectares) is under irrigation. The scope of ground water utilization for sustainable agriculture makes the augmentation of ground water inevitable. Hence the scheme will be implemented in all the 45 districts of Madhya Pradesh, excepting command areas of irrigation schemes, The priority for implementing the scheme will depend on the crisis level. Control over surface run-off and soil erosion and construction of structure for re-charge of ground water is essential.

3.7.2.14 Horticulture

With very wise scope of Horticulture Development in the state, nine Horticulture Development Schemes were included in the year 2000-2001.

1. Development of Commercial Horticulture
2. Development of Medicinal and Aromatic plants
3. Use of Plastic in agriculture
4. Integrated Development of Spices
5. Mushroom cultivation
6. Production and supply of vegetable seeds
7. Scheme for root and tuber crops
8. Development of tropical, arid temperate zone fruits
9. Establishment of Training Centre.

3.7.3 Soil and Water Conservation

The topography of the State is largely un-even resulting in loss of Soil and Water. Nearly 76 per cent of the cropped area is rainfed. In many areas, exploitation of ground water has serious limitations, such a situation therefore calls for measures to conserve soil and run off water on large scale for which watershed approach should be restored to with water harvesting and storage structures as the major component.

The watershed approach has to be an "INTEGRATED" and not merely Soil Conservation Engineering approach, as, that has not given the desired results inspite of huge expenditure in the past. The Department is undertaking integrated work of land levelling, bunding, construction of water harvesting/ storage structures, agro forestry, grassland and dry farming, including semi-arid horticultural plantations to achieve a measure of an "Integrated Watershed Development Programme". The programme of Animal Husbandry, Forestry, Pisciculture, Sericulture, will be taken up.

There are 24 soil testing labs implemented under non-plan sector.

Two soil testing lab are under plan sector at Bastar and Khargone and 4 new labs are proposed in proposed plan period.

S.No	Schemes	Financial provision for X^{th} plan (State share)
1	Scheme of detailed soil survey	5.00 lakhs
2	Grant in aid to soil testing lab at Khargone and Bastar	70.00 lakhs
3	Development of Watershed in dry farming areas (salary and outstanding loans)	2,500 lakhs
4	Danida aided comprehensive watershed development project	1,647 lakhs

3.7.4 Minor Irrigation

In order to utilise the available underground water a minor irrigation programme is being implemented through Agriculture Department wherein following scheme are included.

1. Subsidy to cultivators for construction of wells.
2. Subsidy to tubewells digging in cultivators field by private agencies.
3. Subsidy for sprinklers.
4. Lift Irrigation Scheme "UTTHAN"
5. Subsidy on drip irrigation System for horticulture crops.

3.7.4.1 Tubewell Programme

The medium and large cultivators, having a holding of 4.00 ha. and above land prefer to have their own tubewell. A tubewell structure can be constructed in a short duration in comparision to any other irrigation structure. Thus the further gap between the period of investment and that of return is quite small in compare to other irrigation schemes. Tubewells are also of great help during period of drought as their discharge remain particularly unaffected during such period compared to surface sources of water. Due to these few reasons the farmers are encouraged by this programme in a big way.

At present the subsidy of Rs.25,000/- or 50 per cent of the cost is granted by Water Resources Department on successful tubewell and Rs.10,000/- on unsuccessful tubewell. It is suggested that uniform pattern of subsidy may be given in this programme.

3.7.4.2 Subsidy on Sprinkler

In sprinkler methods of irrigation, water is applied above the ground surface as a spray, somewhat resembling the rainfall. Sprinkler irrigation is suitable for almost all crops, on most soils and for most topographic conditions.

It is particularly suited in cases of water scarcity shallow rooting crops, soils with small water holding capacity and high infiltration rates, soils too shallow to be levelled properly for surface irrigation and undulating or irregular topographic situations. Also for judicious and economic use of water this supposed to be one of the best irrigation system which saves water to the extent of about 25 per cent. Though under different centrally sponsored crop production schemes, subsidy is available to all farmers irrespective of land holding but as this system is becoming much popular and demand is increasing, it is suggested that funds available under minor irrigation may be diverted under this programme.

3.7.4.3 Lift Irrigation Scheme "Utthan"

Under this scheme, a group of 10-30 cultivators will be organised who have 50 to 150 acres of land, near or within 1.5 to 2 kms. distance from a perennial source of water. The schemes is operated on "group" basis, but loan and subsidy is sanctioned on individual basis. The total project cost is divided amongst members, based on the size of their land

holding covering within the project. Individual bank loans are sanctioned, where after subsidy is released. The quantum of subsidy varies from individual to individual depending on the size of his holding. It is 100 per cent in the case of primitive tribes, 75 per cent in the case of SC/ ST cultivators below the poverty line and 50 per cent in the case of small and marginal farmers.

The scheme is already under operation and getting very popular.

3.7.5 Micro- Minor Irrigation

Micro- minor irrigation scheme is the state sector scheme, being implemented in whole of Madhya Pradesh, for creating supplementary irrigation resources by way of construction of stop dam and tanks.

The micro minor irrigation scheme suffered due to state policy according to which the Agriculture Department is supposed to take technical sanction from irrigation department and financial sanction from Janpad and Jila Panchayat. Due to depandabilities on two other departments, it takes lot of time for the sanction of schemes. It is therefore suggested to change the policy and make the departmental officer free to issue the technical and administrative approvals, this will help in carrying out the work speedily.

Presently micro minor irrigation scheme is the only state sector scheme in soil conservation. This scheme is extremely useful since this provides opportunities to give immediate benefits to the farmers. The major advantages of the scheme is as follows :

1. The cost of each structure is very low as compared to big irrigation structure.
2. One structure can easily be constructed in a period of 2 to 3 month, hence provide immediate benefit to farmers.
3. Water harvesting tank and stop dam not only provides life saving irrigation but also used for general Nistar purpose and drinking water for cattle.
4. The construction of such structure also aids to recharging of ground water table hence creating much scope for re-cycling of water through wells/ tube wells.
5. These structures can immediately be started in scarcity period.

Based on the above advantages this scheme is proposed to be given more emphasis during proposed plan.

Sources : 1. Draft Tenth Five Year Plan (2002- 2007), (Agriculture)
2. Draft Ninth Five Year Plan (1997-2002), (Agriculture), Directorate of Agriculture, Govt. of M.P., Bhopal.

3.8 State's response to the already formulated National Agricultural Policy

Following the Government of India's initiative, and realizing the need for government intervention to speed up the pace of agricultural development in the state, Govt. of Madhya Pradesh has also embarked on the preparation of an agricultural policy for the state. The proposed agricultural policy of M.P. is prepared within the broad frame work of National Agricultural Policy.

1. The objectives of the proposed state agricultural policy are more or less similar to the National Agricultural Policy. National Agricultural Policy will achieve substantial (4 to5 per cent) growth in agriculture, whereas, state agricultural policy will achieve 6 per cent growth in agricultural output.

2. Despite the general improvement in food availability, health and social services, hunger and malnutrition exist in some form or the other in almost every part of our country and the state of M.P. is not an exception to this general phenomenon. According to an estimate, over 45 per cent people in rural areas and 40 per cent in urban areas of the state live below the poverty line. This figure is well above the national average of 36 per cent and 30 per cent respectively for rural & urban areas.

3. The Govt. of India Agricultural Policy Document highlights the need for adoption of regionally differentiated strategies for increasing food production. This approach holds high promise in M.P. and has already attracted a great deal of attention of Govt. of M.P. In fact, Govt. of M.P has already launched a programme for enhancing the productivity of paddy in eastern M.P. . Same is the case with horticulture and other allied sectors.

4. The concept of minimum support price (MSP) is not a state subject. The MSP is announced by the central government; not by the state government, if state govt. feels that the MSP for any crop is less, then the govt. may add some incentives or premium to MSP.

5. Seed is the most vital input farmer can rely on for obtaining productivity gain. The reference in the GOI policy document to the need for revamping the National Seeds Corporation (NSC) and the State Farms Corporation of India is welcome. However ,the process will be incomplete if the State Seeds Corporation are left out. State Seeds/farm Corporations play a much bigger role in seed multiplication programmes.

6. There is no specification in national agricultural policy of the role of NGOs in agricultural development. In our opinion, there is need for Govt. of M.P. to define the role that it wants the NGOs and private agencies to play in agricultural development in the state.
7. M.P. is the first state in the country which started Panchayati Raj in the state.
8. Three Agri. Export Zones (AEZs) have been set up for 6 crops covering 17 districts of the state for enabling farmers to face the global challenges confidently. M.P is the first state in the country where Govt. of India has sanctioned Agri. Export Zones for highest number of crops. These crops are potato, onion, garlic, seed spice-coriander, methi, and wheat (durum). Some more Agri. Export zones are under consideration for pulses, oranges, banana and Non GM soybean.
9. In M.P. agricultural policy, top most priority is given for training through programmes like SATCOM, HELLO AKASHWANI, HELLO DOORDARSHAN.
10. In M.P. Agriculture University is located at Jabalpur performing the duties of research, teaching and extension.
11. Large number of medicinal & aromatic plants are available in different agro-climatic regions of the state.
12. More emphasis is given on organic farming in the state.
13. Oilseeds , pulses, and spices are the major crops of the state which received highest priority in the state policy.
14. State has developed many web sides for current information on agricultural sector.
15. The private business houses like M/S Dhanuka Group are undertaking the extension work in Hoshangabad district.
16. Livestock and fisheries based production systems have not been dealt at all in the state agricultural policy. It will be unrealistic to think of improving productivity and sustainability in agriculture without integrating livestock and crop production activities.

17. Jawaharlal Nehru Krishi Vishwa Vidyalaya and a number of other organizations have come out with many fool proof and long term tested dry land technologies, which lead to phenomenal improvement and resource use efficiency, crop intensity and overall income of farmers. The policy statement for dissemination of these technologies to farmers of rainfed areas is very much required.

18. The document does not highlight use of research and development in agricultural biotechnology for improving productivity of livestock and crops. Similarly, inventorisation, documentation and conservation state's agricultural bio-diversity should get due weightage in the document.

19. There is a need for judicious planning of human resource development in agriculture and allied sectors.

20. Technologies duly popularized should have scientific base and always be approved by agriculture university. No product should be launched in the market without prior approval of agriculture university.

21. Purposeful employment of agricultural graduates and utilization of services of retired persons (brain bank) and NGOs through rehabilitation should be looked into.

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CHAPTER – IV

CONSTRAINT ANALYSIS OF AGRICULTURAL DEVELOPMENT IN MADHYA PRADESH

Agriculture is the mainstay of the State's economy. Even with all these achievements agriculture in Madhya Pradesh is still traditional, even though the economy is basically agrarian . The undulating topography, unutilized irrigation potential, practice of keeping land fallow during kharif and taking only one crop in rabi make it imperative that the soil and water conservation, ground water development, crop diversification and substitution are to be undertaken on priority to accelerate growth in agricultural production.

4.1 Constraints identified by the Department of Agriculture, Govt. of M.P.

The constraints of the growth of agriculture as identified by the Department of Agriculture are :-

1. Extensive run-off and soil erosion in most parts of the state resulting into-
   a) water congestion due to impeded drainage in early parts of the monsoon season;
   b) inadequate moisture in latter part when needed most (during the reproductive and maturity phases of crops).
2. Nearly 70 per cent of cultivated area is under rainfed agriculture.
3. Low cropping intensity (about 135 per cent) due to the practice of keeping land fallow in kharif and taking only one crop on residual / conserved / moisture in rabi.
4. Large proportion of cultivable waste and fallow land in rainfed areas.
5. High proportion of low value crops in cropping pattern e.g. coarse cereals account for 38 per cent of the gross cropped area in kharif.
6. Inadequate technology development suitable to specific regions of the state, particularly varieties suitable to match the prevailing rainfall patterns.
7. Large population of tribals and marginal & small farmers having low investment capacity for adoption of high technology.
8. High proportion of non-descript animals and fodder shortage inspite of large proportion of fallow and wasteland leading to low productivity of animals, and
9. Vagaries of mansoon and frequent natural calamities.

10. The fertilizer consumption is relatively low with an average of 46.3 kg/ha and with wide differences across seasons–32.7 kg/ha in kharif and 62.4 kg/ha in rabi. Moreover the N:P:K consumption ratio is 10:7:1 reflecting an imbalance in nutrient use.

11. The seed replacement rate is extremely low. In four major crops (wheat, soybean, gram and paddy), it works out to 4.77 ,5.98 ,1.08 and 2.98 per cent respectively.

12. An evaluation study of the ***"Management of seed supply in oilseeds and pulses in M.P."*** revealed a huge demand- supply gap at different stages due to the poor management. The study suggested that seed production programmes are in the hands of qualified personnel and that conversion factor of breeder's seed to foundation to certified seed is being increasing. In view of this, state government needs a policy framework to develop a dynamic seed industry in partnership with the private sector to increase the coverage under HYV and improved Seed Replacement Ratio (SRR).

13. The present terms of trade are against agriculture, the level of investment both by the public and private sectors has been going down and even the relief offered through annual raises in the minimum support price (MSP) has not helped reverse this trend.

14. Infrastructural bottlenecks come in the way of harnessing to the full the existing potential of agricultural sector.

15. Although the major cropping systems existing in the state are food crop based (with the exceptions of cotton and soybean) pulses and oilseeds constitute an important component of agriculture production system in the state. The field research conducted by Agro-Economic Research Centre for M.P. in Jabalpur has attempted to identify constraints in pulses production. These reasons can be categorized as agronomic, economic and socio-economic.

    a) Lack of awareness and knowledge among farmers
    b) Lack of seed availability
    c) Lack of cash and credit.
    d) Thin and fragmented markets for legumes.
    e) Lack of response of local cultivars to improved management practice.

f) In majority of the cases, old and traditional varieties are grown. Moreover, supply of new varieties of seed is a constraint

g) Pulses are not able to compete with other cereals, oilseeds and cotton in terms of profitability and therefore they are grown on marginal and less fertile lands. This initiates the vicious circle of low yields – lower profitability – lower input use and investment – low yields.

h) Pulses are relatively risky to grow and are susceptible to stored grain pests (i) the real beneficiary of increasing pulse prices was not the farmer but the dal mill owner whose profit margin ranged between 30-35 per cent in harvest season, which increases to more than 50 per cent in case of deferred sale.

16. Increasing population leading to increased demand for food and reduced per capita availability of arable land and irrigation water.

17. The agricultural intensification process, in the recent past, has led to both quantitative and qualitative degradation of land , water, forest bio-diversity and the atmosphere endangering the agro-ecological foundations that are essential for sustainable advances in the productivity of major farming systems.

18. Inadequate growth in rural non-farm employment.

19. Forest plays important role in agriculture. The area under forest is one of the indicators of the status of natural resources of the state. Recently, the state is left with 27.6 per cent forest area as compared to a minimum requirement of 33 per cent (National Forest Policy).The availability of forest area is 0.14 ha/capita against the requirement of 0.47 ha/capita.

20. Problems are also related to soil management in the state. A very large proportion of the soils of the state has been categorized as medium and deep black soils, shallow and medium black soils, also known as vertisols. The deep and medium soils suffer from the problem of poor physical environment. These soils withstand tillage operations on a narrow moisture range because they turn sticky and plastic when wet and hard when dry. As these soils pose a serious problem of management these are left fallow and cropped only during post rainy season on profile stored moisture.

21. An attempt to understand problems related to soil management in the state produced the following illustrative list, in addition to the most severe problem detailed above.

    a) Rainy season fallow in deep and medium black soils makes them vulnerable to run-off and erosion.

    b) With irrigation as in Tawa Command areas, these deep and medium black soils are turning into water-logged and salt –affected due to their low permeability and poor drainage.

    c) With introduction of canal irrigation, the alluvial soils of Gird region are getting affected by salinity.

    d) The soils of Jhabua hills are classified as skeletal soils and suffer from limitation, of soil depth, topography and water retention. About 60 per cent of soils are prone to erosion.

    In terms of soil fertility status, the state soils are generally low is nitrogen, medium to high in phosphorus and potassium.

22. The irrigation sources suggest that even after the full irrigation potential in the state is harvested, only nearly 45 per cent of the present net sown area can be irrigated while the remaining 55 per cent will continue to remain rainfed. The productivity of lead crops is low and has stagnated over the last many years.

23. The large proportion of cultivable waste and fallow land arise out of rainfed agriculture.

24. The proportion of low value food crops is high. The coverage under HYVs is low under major food grains. These factors result into low level of yields of crops.

25. The high livestock population putting pressure on land for fodder results in less availability per animal leading to low productivity of animal.

26. Majority of the farming community belongs to marginal and small size groups. These land holders have low investment capacity to adopt improved technology.

27. Size of holdings is getting smaller and smaller with every agricultural census. The quality of land is getting eroded due to soil erosion, water erosion and decline in fertility status.

28. Water resources are shrinking in more than one ways

a) Proportion of area under tank and canals is declining due to silting of water resources and encroachments, weeds and other vegetative infestation.

b) Ground water table is going down because of over exploitation. Some areas are turning grey & black.

c) Quality of ground water is deteriorating rendering the soils unfit to produce crops.

It is concluded that the undulating topography, underdeveloped irrigation potential, practice of kharif fallowing, large proportion of rainfed agriculture, low groundwater utilization, low value crops with low productivity, large wastelands and high livestock population of low productivity, are the major constraints faced by the state. Moreover large tribal population, high proportion of small and marginal farmers having low investment capacity and inadequate research back up act as deterrants to the growth of state.

4.2 Constraints based on the field research studies conducted by Agro-Economic Research Centre for Madhya Pradesh

Several field research studies were conducted by Agro Economic Research Centre for M.P. in the past showing the problems associated with agriculture.

One study on ***"Identification of factors responsible for declining status of soybean in M.P"***. conducted by the Centre pointed out that the lowering of prices of soybean was foremost important reason. Due to decline in the demand of de oiled cakes in the foreign markets there was a decline in demand of soybean and, therefore, prices in India and MP. Another factor was adverse climatic conditions. For consecutive three years there were unseasonal rains immediately after sowing and also after the harvesting of the crop stocked on the threshing floors. Sterility mosaic, girdle beetle and root rot diseases were other factors. The farmers of Narsinghpur district complained about the large number of species of weeds appearing in soybean crop.

Study on ***"Promotion of oilseed crop (Safflower) in non-traditional areas of Madhya Pradesh"*** pointed out the following bottlenecks. The competing crops of safflower were wheat, gram, mustard, coriander, teora, linseed and lentil in Shajapur and Durg districts. All these crops were grown because of good marketing facilities, profitability per hectare and suitability for home consumption. Marketing was the main problem for safflower. It is treated as economically least profitable crop. Farmers hesitate to grow safflower because its germination was very poor.

Study on ***"Evaluation of management of seed supply in oilseeds and pulses in Madhya Pradesh"*** showed that inspite of many efforts made under centrally sponsored scheme the availability of quality seeds remained a problem. The crops for which the problem was noticed were groundnut, soybean and sunflower among oilseeds and gram, lentil, arhar, moong and urad in pulses. The supply of certified seed gets reduced as the production of certified seed is not economical. Moreover, due to low productivity the production gets reduced. The seed replacement rate is miserably low in all the crops.

Study on ***"Evaluation of Soft Loan Scheme for the development of Post Harvest Infrastructure for Horticultural Crops in Madhya Pradesh"*** observed the following problems faced by selected farmers and PHI units. About 40 per cent farmers said that transportation charges were quite high. Equal number of farmers informed that information on daily market demand and prices was inadequate. Majority of the farmers faced various problems regarding part payment, malpractices during weighing in mandis, high and undue charges deducted by agents, etc. Timely availability of labour is a major problem. Therefore, farmers paid higher amount to the contractors for timely digging of potato. The major problems faced by PHI units (post harvest infrastructure) were power cut, inadequate loan amount, non availability of specialised storage technology for crops like onion, garlic, flowers, fruits, etc. and unhealthy competition.

Another study on ***"Evaluation of the impact on production and export of Central sector scheme on spices integrated programme for development of species in Madhya Pradesh"*** evident that the programme of spices production has not been satisfactory in any of the districts. The seed production programme has been a failure. As regards the minikit distribution the difficulty faced was small size of minikits and the low proportion of subsidy. The seeds and fertilizers were not supplied to the farmers in time. Among the complaints of the farmers the most important was wilt and drying diseases of chilli. There was an acute shortage of proper marketing facility for ginger. In the absence of such facility the farmers can not be encouraged to grow the crops.

A study on ***"Flow of credit to small & marginal farmers in Madhya Pradesh"*** reported that during the past 5 years the portfolio of lenders was shifting towards small and marginal farmers and landless households. The banks has majority of accounts of these categories. The bankers were aware of the new generation institutions like SHGs and the

competition they were facing from them. The new generation institutions were different from the traditional institutions in terms of accessibility of loans due to the habit of thrift , accumulation of savings, which, in turn, was the reasons of ease in sanction and disbursal. It was commented that although new generation institutions were catering to the needs of all segments of borrowers these were working mainly for segments of small & marginal farmers and landless households. Self Help Groups were the only choice among the new generation organizations. The lending procedure of new generation institutions was different w.r.t.fast and easy sanction and easier terms of lending including scheduling of instalments. It was commented that the reasons of the spread of SHGs was the trust bestowed in the leaders by masses. On the matter of subsidy it was emphasised that the success of SHGs was not due to subsidy and it was also vehemently opposed to offering any kind of subsidy adding that subsidy would adversely affect the spirit behind SHGs.

A study on ***"Emerging problems of agricultural marketing with special focus on processing and input supply in Madhya Pradesh "*** pointed out many problems. There were numerous complaints regarding the quality of seed, fertilizers, insecticides and pesticides supplied to the farmers. The processing industry of gram had the main problem of sales tax of 2 per cent in the state. This made the product of this state costlier than the other state. The real beneficence of marketing and processing of gram was the dal mill owner who purchased gram at the lowest prices of season, processed the gram and got the value of every small product and by product. He deferred the sale of products and byproducts to the lean season and got the highest price. The farmers, on the other hand , got no benefit of marketing and processing.

The study on ***"Impact of minimum support prices on the agricultural economy of Madhya Pradesh"*** suggested following problems. Incidences of farmers came to our knowledge wherein the farmers took their produce to mandi but no purchases were made on that day due to one reason or another compelling the farmers to either sell their produce to private traders at much lower price or to bring back home the lot of the produce. The common complaint of the farmers was that the MSPs are not declared well an advance. The MSP should be declared prior to sowing so that the farmer could plan the cropping pattern for their holdings. The produce of the farmer is purchased at MSP in district level mandis and

sub-mandis of the district. However, a large number of farmers residing in villages far interior to mandis and sub-mandis with inadequate transport facilities are at the mercy of small traders and middlemen who with some transport facility purchased the produce at much lower price than MSP and sell it in the mandis and submandis pocketing the commission/ huge profits. Many of the farmers complained that payment for the produce sold takes between one to two weeks because of procedural delay.

In the study on ***"Impact of National Watershed Development Project for Rained Areas (NWDPRA) of Madhya Pradesh"*** observed that the majority of the beneficiaries got such benefits which could be termed as marginal or peripheral. There was not much difference between the profitability per hectare of beneficiary and non beneficiary farms and even if there was any difference it had nothing to do with the NWDPRA implementation. This was because of the fact that the NWDPRA activities were only marginal or peripheral. Secondly, the impact of inputs supplied could be assessed only after few more years. The impact of saplings supplied and construction of Nadef compost pit could be felt only after 5 to6 years.

A very important study on ***"Likely impact of liberalized imports and low tariff on edible oil sector of Madhya Pradesh"*** showed that a large section of farmers depended on oilseed based agriculture for their livelihood. This study examined various aspects of soybean production, processing, disposal, consumption pattern of oils and farmer's opinions on likely impact of import of oil at cheaper rates. It was found that farmers were unable to name other crops which could replace soybean at that stage despite its declining production, productivity and prices. Farmers were unaware about the new economic policy with reference to WTO. They anticipated that it would lead to unemployment and less income. Reduction in import duty on edible oils may increase the import of edible oils and bring down the prices of domestic oilseeds and oils. The dampening effect of domestic prices of oils and oilseeds will make oilseed crops less remunerative as compared to competing crops. This in consequence may change the cropping pattern, affect employment and farm income.

4.3 Constraints related to Allied Sectors

A Study on ***"Prospects of value addition of forest produce in tribal areas of Madhya Pradesh"*** observed the following problems. The problems faced by the collectors or tribals are: lack of coordination and cooperation among the tribals or collectors of minor forest produce, lack of capital, ignorance about the benefits obtained from the ultimate products, absence of facilities of grading and standardization of minor forest produce, lack of infrastructural facilities in the forest area, malpractices in the marketing of MFPs (tribals are exploited by middlemen by way of short weighing), delayed payment of purchased MFPs amount, unremunerative prices affecting collection, instability of minor forest product's production, lack of knowledge of processing and storage, absence of cooperative infrastructure facilities, insects & pests attack, and; absence of regulated market, and deforestation.

The tribals should be made aware of grading, processing and storing for value addition by the forest department and NGOs in the area.

A study on ***"Evaluation of Fish Farmers development Agencies in Madhya Pradesh"*** suggested the following problems related to fish farmers of the state.

i) Pond preparation which involved desilting, removal of weeds, removal of unwanted fish and unwanted vegetation posed many problems.

ii) Quality of pond water.

iii) Poor supply of seed.

iv) Cold storage and marketing facilities are poor.

v) Lack of technical guidance.

vi) Theft of fish during the nights, and

vii) Fish diseases.

Study on ***"Economics of poultry production and marketing in Jabalpur district, Madhya Pradesh"*** observed that poultry marketing especially broiler marketing is not well organized and the absence of "N.E.C.C" like organization worsened the situation further. Moreover, due to absence of any practical solution (technologies) the withholding of broilers during slump is not practically possible and forced many small farmers out of the business.

4.4 Strategies for future development

The above analysis suggests that the focus of future development should be on the following strategies :

1. Soil and water conservation.
2. Development of irrigation.
3. Rationalization of cropping through i) Crop substitution and, ii) Crop diversification
4. Horticulture Development.
5. Wasteland Development
6. Livestock and fodder development
7. Intensive research and development efforts for the improvement in crop production including horticulture development and milk production.

4.5 SWOT analysis for agricultural and allied sectors of Madhya Pradesh

SWOT analysis will reveal the true potential of the agriculture and allied sectors of M.P. for charting a course of action. This analysis is based on the opinions of various stakeholder like agricultural scientists, farmers, Directorates of agriculture and horticulture, Veterinary, Forest etc.

4.5.1 Strength

1. The state is centrally located and second largest state of the country. It is rural in character and the density of population is low and ranks far lower among states.
2. The state has mega diversified agro-climatic regions.
3. The state has varied topography comprising plateaus, valleys, mountain ranges and plains. The rainfall varies from less than 600 mm to more than 1,600 mm.
4. Because of the varied topography and rainfall it grows numerous crops and crop groups viz. cereals, pulses, oilseeds, fibres, fruits and vegetables, spices, etc.
5. The state stands first in area and production under oilseeds and pulses. Because of the highest area and production under soybean the state is called soya state of the country.
6. The state is rich in bio-diversity and human resources. There is no dearth of germ plasm for research and development at regional level.

7. The state has the largest arable area under crops and therefore self sufficiency in food grains.
8. There are potential districts in the state having excellence in crop varieties and livestock production.
9. In view of the low level consumption of agro-chemicals, organic production of agricultural and horticultural products have great future for export of the quality products to the elite consumers of developed countries like banana of Burhanpur district , citrus of Chhindwara district, chinnor rice of Balaghat district, gram, arhar, lentil of Narsinghpur district, durum and sarawati wheat of Malwa region, cotton in Nimar and coriander of Guna district, etc.
10. There is relatively well developed teaching facilities, research development and extension organization in the state. One multi compii Agriculture University with seven agricultural colleges, two veterinary colleges, one agricultural engineering college, 26 regional research stations, and 15 Krishi Vigyan Kendras (KVKs) alongwith Central Institute of Agricultural Engineering (CIAE) and Central Institute of Soil Science, are available in the state which can cater location specific needs of all categories of farmers.
11. Importance of commercial agriculture is increasing in the state.
12. Sufficient demand of horticultural produce is developing in domestic market.
13. Sufficient wasteland and hilly areas are available in the state where the possibilities of horticultural crops is more.
14. In the case of horticultural crops, cost benefit ratio is favorable than agricultural crops.
15. There is increasing trend of use of horticultural produce in daily diet and value added produce.
16. Sufficient land is available in the beds of rivers for vegetable cultivation.
17. Many big and small river's network exists in the state.
18. Many mega capacity reserviors are underway of completion.
19. Govt. of Madhya Pradesh has provision to exempt land ceiling act and also extended the revenue wasteland to attract big sized and ultra modern enterprise in horticulture.

20. The state has developed a long nursery chain in public sector throughout the state for producing fruit plants. So far 307 fruit plant nurseries have been established in of 313 blocks of the state. This facility is unique in the country.
21. There is ample scope to make the farmers self reliant by developing awareness regarding latest technologies and future prospect of global market in horticulture.
22. Large potential also exists in the state for non-traditional fruit crops like litchi, coconut, pineapple, pear, coffee, etc.
23. The state is rich in animal wealth (28.7 m.cattle, 7.95 m.buffaloes and a combined population of 11.5 m.sheep, goat, horses, pig and camels) alongwith poultry. The livestock sector provides good quality manure to the agricultural sector.
24. Good quality of non timber forest products are available in sufficient quantity in the state.

4.5.2 Weakness

1. The state as a whole has a lower literacy percentage as compared to that of the country. Female literacy percentage is also quite lower.
2. Lower literacy percentage among scheduled tribes and scheduled castes farmers affect adversely in the adoption of advance technology in agriculture. Majority of these farmers are illiterate.
3. Due to low percentage of irrigation and low per hectare consumption of fertilizers, the productivity of most of the crops is lower than that of the country.
4. About 70 per cent is rainfed farming and two thirds farmers are small and marginal having poor resource base, less adoption of agricultural technology and poor infrastructure facilities.
5. Poor availability of electricity for agriculture throughout the state.
6. Weak financial support from state government. Public investment in agriculture is less and declining.
7. The forest area in the state is less than the desired level (33 per cent). A large area is under degraded forest.

8. The groundwater level in the state is going down and many of the regions are becoming – dark.
9. Lack of infrastructural facilities such as good roads, good transport facilities, cold storages and other post-harvest management facilities, etc.
10. Less developed agricultural markets and absence of organized marketing system for horticultural produce in the state.
11. Outdated laws associated with land reforms.
12. High import duties and air freight charges.
13. Lack of sufficient quality planting material of horticulture.
14. High cost of inputs and low productivity of traditional crops varieties.
15. Inadequate research and extension support for development of new technologies on regional basis.
16. Weak infrastructure for training facilities.
17. Organization of the Directorate of Horticulture is not judicious. Pay structure of field staff is not judicious. Promotion opportunities to the field staff is very low. The employees remain on the same post for over 20 years. The staff is hesitant to perform its duties efficiently.
18. Mobility of the officers and staff is very poor because of non-availability of vehicles to district level functionaries.
19. The health care system of cows, buffaloes, goats, poultry birds, horses and other livestock has not been given due care and importance in the state.
20. Lack of availability of proper nutrition and palatable ration have resulted in extremely poor productivity of animals and birds in the state. (Poor breeding, feeding and management of bovine population).

4.5.3 Opportunities

1. Being centrally situated and surrounded by 7 states (some of these agriculturally quite prosperous) the farmers have easy access to the knowledge of the farmers of

neighbouring states. The farmers of this state have done so in the case of crops like banana, cotton, groundnut, wheat, etc.

2. Due to varied soil types, climate, topography and irrigation development in the state offers possibilities of growing wide range of crops. Efforts have been made to grow crops like coffee, grapes, etc. hitherto unknown in the state. These should be encouraged.

3. Although the state has comparatively lower percentage of irrigated area, with the undulating topography and numerous rivulets and nallas there is ample scope for building stop dams to harness the micro irrigation sources. With limited scope for major and medium irrigation projects the state can go in for minor and macro projects.

4. The tribals of the state collect products like tendu leaves, mahua, harra, behara, catachu, awla, honey, sal, gum and other products used in spices and pickles from forests. With the growing popularity of ayurvedic medicines and herbal beauty aids these products offer vast opportunities. However, in the absence of tribal cooperative marketing societies and facilities for processing the products in situ the tribals are exploited by urban traders. The state government has involved itself in the trade of minor forest products by forming tribal cooperatives. There was good scope for giving the tribals their due share in the profits accrued

5. Expansion of irrigated area will not only change the cropping pattern from predominantly foodgrains oriented to cash crop oriented but also increase cropping intensity, stabilize and enhance the yields of most of crops and will also ensure higher area under HYVs and higher use of fertilizers. (High productivity of agricultural commodities is possible as there is big gap between potential and realised yield).

6. Return to R and D expenditure is high.

7. Growing global market for organic foods which can be grown in this state as the consumption of agri-chemicals are in low -eb.

8. There is a lot of scope of rain water harvesting in the state.

9. Ample suitable land is available for horticulture.

10. Sufficient manpower is available.

11. Sufficient scope for crop diversification in the state exists.

12. State Govt. is providing facilities to the industrialists for agro based industries.
13. Govt. of India is launching many Agri.Export Zones (AEZs) in the Madhya Pradesh.
14. Large scope for rainfed horticulture in the state exists.
15. Since forest products are a very important source of income to the state Govt.; intensive efforts need be made for the afforestation of degraded forests.
16. Wasteland could be brought under cultivation if additional investment in irrigation is made.
17. Organic and non-GM farm product are in great demand India may use traditional wisdom for its production and export as organic farms of cotton and groundnut are developing in Malwa and Nimar regions of M.P.

4.5.4 Threats

The rural population of the state constitutes about 76 per cent of the total population. With the shrinking natural resources of land and water, the dependence of population on agriculture is increasing. Various studies conducted show that :

1. The average size of holding is decreasing with every agricultural census.
2. The proportion of number of holdings in the marginal and small size groups is increasing.
3. The distribution of number of holdings and area occupied is quite skewed.
4. It may be mentioned that whatever area is covered in the name of forest is not necessarily of a desired standard. A large area is under degraded forest and the satellite pictures have clearly indicated that forest areas are not entirely covered by forests. Since forest products are a very important source of income to the state government intensive efforts need be made for the afforestation of degraded forests.
5. Due to highly food crops oriented cropping pattern coupled with low productivity of crops, the profitability in agriculture was low. This resulted in low level of resource use initiating the vicious circle of lower productivity etc.
6. There existed 4.5 per cent fallow land. The most important measure which can bring down the proportion of fallow land is irrigation.

7. Wasteland could be used for grassland development, dryland horticulture, fuel wood plantation or cultivation of medicinal plants.
8. Large area termed as forest is actually not under forest. It has only shrubs. Such land could be used for growing forage crops. It is very essential in view of large livestock population with low productivity due to malnutrition.
9. In view of this efforts need to be intensified to find out non-agricultural jobs for a section of rural population and encourage allied agricultural activities like dairy, poultry, fishery, piggery and bee-keeping.
10. Measures should be taken to reduce waste land and checking the expansion of waste land by providing irrigation.
11. With the popularity of soybean crop other traditional crops like minor cereals and millets are being replaced. This may create food shortages in the long run. High yielding and more profitable varieties of food grains should be developed.
12. Productivity of crops is lower in the state and in some cases it is declining due to three reasons i.e. lower percentage of area under irrigation, lower percentage of area under high yielding varieties and lower doses of fertiliser application.
13. Population is a major threat for self sufficiency.
14. Removal of quantitative restriction may blow hard to domestic market of raw and processed agro-industries.
15. Inadequate capital and technology and its flow is skewed.
16. Unstable demand and fluctuation of prices in the market may put the producers in loss under glut situation.

There is also the need for all stakeholders of food industry, namely farmers, food processor, R & D institution, state agricultural University, govt. agencies, financing agency, professional and others in the food supply chain, to network to make the agriculture and food processing business dynamic and efficient.

There is immense potential in categories like traditional and ethnic products, conventional foods, organic foods, health foods, minimally processed fruits and vegetables,

fruit & vegetable products, packaged and branded food products. It is to be noted that food safety, hygienic and good manufacturing are becoming essential both for export and for the growing domestic markets. Concepts such as Hazard Analysis Critical Control Point (HACCP) for food safety are becoming mandatory in several sectors of food industry.

4.6 Views of Stakeholders of the State

For the preparation of this report, several persons and organisations have contributed their cooperation, comments and suggestions. A questionnaire / schedule was prepared by this Centre to know the views of the important stakeholders related to impact of WTO agreement on agriculture and allied sectors of Madhya Pradesh. On the basis of discussions made with the stakeholders and the schedules filled up by them, it was noted that most of them were not fully aware about the new economic policies with respect to W.T.O. Most of them did not reply the questions related to W.T.O. Whatever the information is available from stakeholders on the future agricultural development of the state is presented below.

4.6.1 Directorate of Horticulture and Farm Forestry , Govt. of M.P.

a) The **objectives** of the Directorate of Horticulture, Govt. of M.P. are; i) area expansion of horticultural crops, ii) increase the production and productivity, iii) increase the post harvest management awareness, and, iv) educate the farmers for scientific cultivation of horticultural crops.

b) The **policy** of the department is to boost the production of fruits, vegetables, spices, medicinal and aromatic plants in traditional areas. Make the wasteland productive through horticulture crops. Increase the productivity of horticultural crops in large rainfed areas of the state.

c) **Present and future plans** of development are; supply of good high yielding planting material, extension of scientific crop production package of practices among farmers through minikit and demonstration methods, replacement of traditional inferior low productive seed and planting material by high quality improved seed and educate the farmers for scientific cultivation.

d) **Objective of the Directorate in view of WTO agreements** signed by Government of India.

Horticultural production of the state will increase for self need fulfilment and for the export outside the state as well as abroad and quality improvement according to international standards

e) **Future plans and programmes** of the Directorate will be to double the horticultural production by 2020 by area expansion and increasing productivity.

f) In view of the provisions of WTO agreement, the stakeholders did not reply the WTO related questions.

g) The response of the farmers is very good about horticultural development activities in the state. Horticulture production is giving higher employment and income to the farmers.

h) No organised marketing system exists in the state. Cooperatives involvement in the marketing is negligible. Role of grower in marketing is very important but he is always exploited by marketing middleman. Sometimes farmers disposed there produce at very low prices. No government rules and regulation for price control. Market intelligence system for production, arrival, demand and availability is not available in the state.

i) Two agri export zones (AEZs)are sanctioned for horticultural crops in the state.

i) Potato, onion and garlic agri export zone (AEZ) in 8 districts of Malwa region have been developed.

ii) Seed spices agri export zone for 5 districts of the state for coriander, fenugreek crop produce have been developed.

4.6.2 Directorate of Animal Husbandry and Veterinary Services, Govt. of M.P.

Animal husbandry sector has played significant role in socio – economic sector, employment generation especially in the rural sector particularly among the landless, small and marginal farmers and women groups. It also provides cheap and nutritious food in the form of animal protein. Livestock also maintains bio-diversity, environment and conservation of energy. Therefore, special emphasis has to be laid on the animal husbandry sector.

The important points of livestock sector in the state agricultural policy are as follows:

(a) In addition to promote the concept of mixed farming alongwith dairy & poultry; goatry, sheep, piggery and dry dairy farming shall also be taken up.

(b) Apart from conservation and improvement of cattle and poultry, buffalo like Bhadawari and some non-descript available local breeds of goat as Berari, Jauloni type sheep and malvi camel should be identified and characterised and to be conserved and improved in certain localized pockets of the state.

(c) Special attention should also be paid to improve variety grasses and pasture development programme.

(d) Besides stall-feeding practices, fodder conservation programmes like hay making, silage making, use of chaff cutter, urea treatment and fodder banks should also be promoted.

(e) To reduce unproductive animals, besides castration, under dry dairy farming concept, more number of Gosadans, Goshallas should be established in government and private sectors .

(f) Besides milk targets of other animal products like meat, eggs and wool should be decided, five year phase wise strategically.

(g) The basic activities like health care and breeding services should be strengthened and expanded through infrastructure development and strong network.

(h) Agricultural policy on livestock has not included small animals, wild animals and other poultry birds like quails, ducks, gees, ostrich, etc. The policy for development and conservation of these livestock and poultry should also be considered.

(i) Animal resource management including market management.

(j) Value added programmes like milk and milk by products, meat and meat byproducts, egg and egg byproducts, wool and wool byproducts, skin and skin byproducts, bone and bone byproducts, dung and urine byproducts should be undertaken.

The following **ongoing schemes** are being implemented by veterinary department.

1. Induction of cattle for milk production.
2. Improvement of cattle by artificial insemination & natural services.
3. Conservation of Indigenous breeds.
4. Distribution of backyard poultry & cockrell units.
5. Exchange of bucks and distribution of goat units.
6. Distribution of pig trios and pig units on exchange basis.
7. Subsidy for fodder demonstration plots.

The stakeholder did not answer the WTO related questions.

4.6.3 Directorate of Fishery, Govt. of M.P.

For the sustainable development of fishery in M.P. under the 10th plan, the following objectives, strategies and priorities are set up.

1. To bring additional water area under fish culture.
2. To attain self sufficiency in fish seed production.
3. To promote fishermen welfare programmes through investments in housing, education and health.
4. To train fishermen and fish farmers.
5. To promote fishermen cooperatives, and,
6. To increase productivity of the ponds and reservoirs through use of biotechnology.

Madhya Pradesh has a total of 3.87 lakh hectares of water area available for fish culture in the form of small village ponds, tanks and reservoirs. Out of this, 3.11 lakh hectares have been brought under fish culture. This includes 0.75 lakh hectares of village ponds and 2.36 lakh hectares of irrigation reservoirs. About 20,661 kms of rivers and their tributaries flow through the state. There are about 2.00 lakh fishermen engaged in fishing and allied industries belonging to the traditional fishing communities, SC, ST & backward classes. The bulk of these fishermen belong to the weaker sections of the society.

To develop fishery in the state, the department will adopt following policies in the coming decades .

1. Use of bio-technology and modern medicines in fish and seed production.

2. Integration of fish culture with other agri-practices like paddy, dairy, poultry, piggery, etc.

3. Encouragement and popularisation of pan culture and cage culture for seed raising and fish production.

4. Genetically improved cultivable species will be preferred as stocking material. Genetic quality of brood stock will be improved by induction of brood from the wild.

5. To enhance per hectare production of fish, stocking of large size fingerlings will be encouraged.

6. To encourage development of reservoirs up to 2000 ha through cooperatives of the displaced persons, fishermen and SHGs, etc.

7. Fresh-water prawn (Macrobrachium rosenbergii) culture will be encouraged.

8. Restoring riverine environment for increased fish production and conservation of endemic fish fauna.

9. Use of Information Technology in the dissemination of information to the remotest corner of the state.

10. To encourage aquarium fish breeding and culture.

11. To develop angling facilities to boost tourism, establishment of fish hatcheries and seed production units separately for sport fishery in suitable areas will be taken up.

12. Reservoirs will be developed by adopting various enhancement norms. There will be provision for private sector/industrial participation. Stocking of carps other than Indian Major Carps will be encouraged.

13. Sensitization of policy makers, planners and managers on various aspects of enhancement will be taken up on priority basis.

14. Greater emphasis will be laid on imparting skill development in different enhancement activities to the fisheries, oustees of reservoirs, cooperatives, etc. for enhancing productivity and facilitating rehabilitation.

15. There will be special drive to educate fisherwomen and make them aware of the importance of scientific fishery management.

16. To increase per hectare production from village ponds by use of better inputs.

Marketing of fish :

At present there is no organised marketing of fish in Madhya Pradesh. The fish produced by the cooperatives is brought to the local market where it is auctioned by wholesalers. To strengthen the marketing of fish a fishermen federation of the cooperatives has been organised which will take up marketing of fish in the state as well as out side the state. To spread the functioning of the fishermen federation, there is a plan for setting up of thirteen district federations in the potential areas of the state. The federations will also be encouraged to explore and take up export of fish to other countries where sizeable demand for inland fish exists.

On WTO issues, no reply was received.

4.6.4 Water Resources Department , Govt. of M.P.

Water is the most precious resource for a sustainable growth of agriculture in the state. For the purpose of assessing the water resources, it was thought appropriate to consider rainfall and irrigation as a resource because a large part of the state receives assured rainfall.

The accelerated pace, at which the ground water resources have been exhausted, without replenishment, has thrown the most valuable ingredient of modern agricultural system out of gear ; tubewell irrigation that acted as the most decisive harbinger of the green revolution technology, was largely responsible for introducing new crops and re-shaping existing crop combination, and was the most dominating instrument in pushing up cropping intensity, is now inflicting technological and commercial infirmities, not only on the small and marginal farms but also on medium and big farms. The depletion of ground water resources now stands among the most serious concerns of state agriculture in as much as it has led to highly damaging consequences for irrigation availability, agricultural productivity, cost of production and efficiency, income distribution, in fact for the total edifice of agriculture, in many parts of the state economy. For a host of reasons, most ostensibly the unending competition among the farmers to climb higher and higher on the irrigation-led technology ladder, on the one hand, and the subsidised supply or free supply of electricity by the government, on the other. State agriculture has been a moot witness to the fast pace of

ground water depletion. This is a problem for which a greater part of the blame must be put on the state government. In many parts, the ground water table has gone many times lower so that the centrifugal tubewell irrigation technology which was well within the means of small farmers, around the time that the green revolution arrived in India, is beyond the investment capability of even the medium and large farmers. Coming back to the management of ground water problem, artificial re-charge of ground water reservoir has been recognised as one of the important strategies to counter the menace of over-exploitation. It reduces, and in many situations, even reverse the declining levels of ground water tables, protect fresh ground water and stores surplus surface water including the monsoon run-off and waste water for future use. Rain water harvesting and vegetative treatment of watershed helps in increasing the ground water recharge.

There are nine major rivers flowing through the state. They together generate 66.5 million acre feet (maf) of water every year, of which about 70 per cent could be harnessed for irrigation purposes. Besides this, 22.3 maf of groundwater is also available of which 50 per cent could be utilised for irrigation purposes. However, the gap between the estimated potential and the potential actually created by major and medium project till 1999-2000 is substantially large. As against the created potential of 20.18 lakh ha, actual utilization is only 10.01 lakh ha. To harness the potential of irrigation, special emphasis need to be placed on constructing water harvesting structures in the state on a massive scale.

The state government formulated an appropriate "State water policy" (September, 2003) providing for conjunctive use of surface water and groundwater and for promoting water users' associations for ensuring judicious use of water and collection of water charges. The government has already made a good beginning in this direction. In state water policy the emphasis is given on maintenance and modernisation of dams and canals from time to time. The priorities of water use should be in sequence of drinking water, irrigation, production of electricity/ industrial use, and for tourism. Legislation should be made for control of quality of drinking water in rural & urban areas. Reduce the gap between created potential and actual utilization of irrigation water so that full utilization of irrigation water could be made. Water charges should be judicious. There should be inclusion of non government organisation in the management of water. Emphasis should also be given on flood control management, science & technology and training of employees and farmers of the state..

4.6.5 Department of Energy, Govt. of Madhya Pradesh

The main objective of the department is development of power sector and non-conventional energy sources in such a manner that people of the state get quality power at affordable price. The installed generating capacity in M.P. is 2,990 MW. The generating capacity from non-conventional energy source is 21.69 MW. The requirement of electricity (power) at present is about 4,500 MW. Suitable measures may have to be taken to meet electricity demand arising out of technology advancement. Power sector reforms programme is introduced but it is not specifically in the context of WTO provision. Since the power sector reforms programme was not specifically in the context of WTO, this may not be applicable. However, reforms have resulted in rationalisation of tariff, efficiency gains, better revenue recovery, etc.

Access to electricity has resulted in growth of agricultural produce & better crop yields which generated the employment and income of the farmers .

4.6.6 Department Of Post Harvest Technology & Value Addition, J.N. Agriculture University, Jabalpur

This department works on various aspects of harvesting, packaging, transporting, storage and losses associated to it alongwith utilization of agricultural wastes and development of new equipments for post harvest processing of cereals, pulses, oilseeds and other crops. The policy of the department is determining the reasons for the existing poor outtern in the processing and milling and devising ways and means of increasing milling yield and reducing the losses. Now, the department is planning to establish modern agro-processing centres to provide training to the farmers and small enterpreneurs for primary processing of agricultural produce. The objectives of the department is development of agro-processing centres in selected districts so as to eliminate the profits of middlemen involved in processing of farm produce.

In the state, fertilizer consumption is very low. The farmers are producing crops with the help of organic manures. The demand for the products produced with the help of organic manure is higher. If the farmers' produce is exported, there will be positive opportunities for them. The threats or negative or discouraging points with respect to farmers of M.P. are that

the majority of the farmers belong to small and marginal categories thereby not able to export their produce in the world market. The initiatives taken in response to WTO agreement are not encouraging and more fruitful efforts should be made.

Suggestions with respect to tentative state agricultural policy with special reference to the WTO agreement reached.

i) Identification of farmers who are producing crops with the help of organic manures.

ii) Encouragement to use of bio-fertilizers.

iii) Special training for processing of farm produce keeping in mind the export point of view.

iv) Establishment of modern agro processing centres at district H.Q. for training the farmers and small entrepreneurs.

v) Establishment of centres for export of farmers' produce.

Probable issues that the state may face in view of WTO agreement.

1) Non availability of proper agro-processing centres in the State.

2) Non availability of trained labour to handle horticultural crops and other perishable material.

Measures to be taken to deal with such issues

i) Establishment of proper agro-processing centres.

ii) Proper training to the labourers for crop processing.

iii) Proper training to the labourers & enterpreneurs for handling of perishable crops.

Programmes / Schemes initiated after WTO provisions

1) Identification of crops grown without use of chemical fertilizers and the places/ areas.

2) Identification of different export zones for different crops.

Targets/ achievements of each programme/ scheme

1) Some of the established zones for export of crops have started functioning.

2) Processed products from export point of view have also been indentified.

Response of the farmers

The response of the farmers is positive but they need more encouragement.

Awareness of farmers about WTO agreement

Some of the progressive farmers are aware of challenges of WTO but majority of farmers are lagging behind.

The establishment of agro processing centre for atleast primary processing of farmers' produce can definitely increase the income of the farmers and generate the employment opportunities in the rural areas.

The reduction in subsidy will certainly give an adverse effect on production of agricultural produce. The cost of the product will be high.

In the country like India, where we are self sufficient in meeting our requirement, the import will definitely distort the domestic prices.

The products which are produced by using chemical fertilizers, insecticides can not be exported (SPS measure). Also the products not maintaining International Standards can not be exported.

4.6.7 Madhya Pradesh State Cooperative Marketing Federation Ltd (Markfed)

The objectives of the federation are i) distribution of fertilizers, ii) provides storage facilities for agricultural products and fertilizers, iii) provide appropriate quality of pesticides, cultures, seeds, etc. to the farmers at reasonable prices and, iv) provide standard quality of agricultural machinery to the farmers under subsidy schemes of state government, v) calling tenders from the manufacturers / distributors of pesticides / micronutrients / bio-fertilisers etc, with the consent of the agriculture department.

The federation also works as agent of seed corporation and fertilizer companies. It also takes up programmes of construction of new godowns in rural and urban areas, phase-wise.

In view of WTO agreements, the policies of the federation are, to make available agricultural inputs at competitive prices, procure agro-commodities from farmers at market rates so as to maximize benefit to farmers, undertake support price operations as per the govt. of India directives and create storage infrastructure. Future plan of the federation is to expand operations into export and import of agro-commodities, establish cold-chains and to consolidate existing business. WTO agreement provides the opportunity to make the business more cost effective by opening it up to international trade competition. Some more protection should have been given to the farmers relating to agricultural subsidy. Custom duty barriers should have been imposed for a longer period so as to insulate domestic agriculture from international competition until indigenous industry became more competitive. WTO provisions shall make farmers more progressive and cost conscious and

shall open up more areas for competition. The state of M.P. is yet to come out with comprehensive policy initiatives in response to WTO agreement. However, tentative measures like setting up of agri export zones have been taken. A consistent and long term policy for agriculture is needed. The reduction in subsidy on inputs like fertilizers, seed, pesticide etc. may affect the production. Imported agricultural produce and inputs may be cheaper, hence Indian fertilizer industry will suffer. The import of agricultural. products will affect the price and it will depend on how much quantity is to be imported. Imports help to meet the shortage of particular commodity and also remove distorting high domestic prices. The state exports large quantity of food grains, pulses and oilseeds.

The constraints in export are i) export infrastructure is lagging, and ii) high domestic prices are a deterrent for exports.

4.6.8 M.P. Minor Forest Produce Cooperative Federation Ltd.

The MP State MFP Cooperative Federation was established in 1984. In 1988, M.P. Government decided to totally eliminate the middlemen in collection, storage and trade of minor forest produce, and authorised the formation of cooperative societies of actual collectors. In 1998 the state Govt. decided to confer the ownership rights of non wood forest products (NWFPs) to the Gram Sabhas and to distribute the net profit of NWFP trade among the collectors as follows.

i) Fifty per cent in cash to the collectors.
ii) Thirty per cent for infrastructure development of villages.
iii) Balance for development of the forest resource.

The federation was made the nodal agency of the state for trade and development of NWFPs in 1999. In 2002, the federation was again made the nodal agency for the processing of bamboo.

Being the apex body at the state level the federation looks after the entire trade and development of nationalised NWFPs viz. tendu leaves, harra fruit, sal seeds and gums. There has been a renewed interest in lac cultivation in the world market in recent times. Present production of lac in the state is about 25,000 quintals. Efforts are being made to enhance the production through training of farmers, extension and making available brood lac.

Online Marketing

The federation provide a space on its web site **www.mfpfederation.com** with facility of free registration to the buyers and sellers of medicinal and aromatic plants and to put up their requirements or availability of the produce.

4.6.9 M.P. State Seed Certification Agency

This agency is performing the duties of seed certification in the state in a systematic manner. The agency was established in M.P. on 21st January, 1980 under section 5 of the Seeds Act 1966. The purpose of seed certification is to maintain and make available to the public, through certification, high quality seeds and propagating materials of notified kinds and varieties so grown and distributed as to ensure genetic identity and genetic purity, physical purity, quality and health.

The headquarters of the agency is located at Bhopal with 8 divisional offices (Bhopal, Indore, Ujjain, Jabalpur, Gwalior, Rewa, Khandwa and Sagar) and 2 seed testing laboratories (Indore and Jabalpur) and one grow-out test farm (Delmi, Dhar).

Seed of only those varieties which are notified under section 5 of the Seeds Act, 1966 shall be eligible for certification. The phases of seed certification are i) verification of seed source ii) field inspection iii) seed processing and testing iv) tagging, sealing and issuance of certificate.

The validity period of the seed certification shall be nine months from the date of test at the time of initial certification.

In response to the WTO agreement, this agency can perform the certification of organic production in addition to the existing work of seed certification without any hindrance. Looking to this fact, the license can be granted to this agency for certification of organic produce.

4.6.10 M.P. State Seed and Farm Development Corporation (Beej Nigam)

The corporation is providing its services to the farmers of the state since 1982. The mission of the cooperation is, production of quality seeds of notified varieties of all major cereals, pulses and oilseeds and to supply quality seeds of recommended varieties to the farmers of the state at reasonable prices, by which there will be self reliance in seed and thereby increase in production and profitability.

The **objective** of the corporation for 2003-04 are :

i) Execution of seed production programme on cultivator's field to produce breeder to foundation – I and foundation –II seed.

ii) An innovative approach is initiated by the Corporation to ensure the supply of foundation –II seed for one tenth area of each crop to each farmer by which farmer can produce certified level seed for 100 per cent seed replacement rate.

iii) To run and develop Corporation's Farms for better production and profitability.

iv) Timely distribution of quality seeds at reasonable prices to farmers through cooperative societies, agriculture department, seed sale centres of corporation and authorised dealers of corporation.

v) Corporation also helps in stabilizing market prices of seeds. The corporation owns 42 agricultural farms and 46 processing centres. It produces nearly 35,000 qtls. of foundation seeds on its own farms and trades nearly 3.50 to 4.00 lakh qts. of certified seeds annually.

Thrust Area

Production and promotion of duram wheat, vegetables, spices and tribal crops (NWFP) in Madhya Pradesh.

For distribution of quality seed to the farmers, five new processing plants have been installed to spread production in new areas. The Corporation is going to computerise 30 processing centres out of 46 centres with aid from Govt. of India.

4.6.11 M.P. State Cooperative Oilseed Growers' Federation Ltd (OILFED)

The federation was established in October,1979 in M.P. The objective of the federation is to develop better infrastructural facilities for increasing the production of oilseeds, processing and marketing of oilseeds in the state so that growers can earn more profit.

The basic aims of OILFED are :

i) To organise and develop Oilseeds Growers' Cooperative Societies (OGCS) at village level.

ii) To provide inputs like improved quality of seeds, fertilizers, rhyzobium culture, insecticides/pesticides to farmer members through OGCS and to impart training for improved farm practices to enhance production and productivity of oilseeds particularly soybean.

iii) To procure oilseeds from the farmer members through OGCS at remunerative prices.

iv) To instal modern processing facilities to process oilseeds of the farmer-members , and

v) To sell oil and export soybean De-Oiled Cakes (DOCs).

The contribution of the state is 20 per cent in making the country self-reliant in edible oils. To increase oilseed production up to 30 per cent during 10^{th} plan by implementing Safflower Development Project in rabi season in the state.

In view of WTO agreement, emphasis would be given on safflower cultivation in the state just like soybean. The subsidy in developed countries is more. Due to this the imported oil is cheaper than the oil produced in the country.

Only for this reason, the farmers of the state are not getting remunerative prices of oilseeds and oils. This situation will affect the development of oilseed crops and oil industry of the state. For controlling this situation, efforts should be made on economic farming of oilseeds and to increase the quality of oilseeds in the state by adopting SPS measures. Emphasis should be on cultivation of safflower in the state. By increasing the area under safflower the availability of oil in the state as well as in the country will increase and dependence on import will get reduced and farmers will get better prices for their product. Efforts should be more on the development of oilseeds/ pulses instead of cereals and improve this sector as export oriented by increasing the production of safflower in the state.

Due to reduction in the import duty, oilseeds & pulses will be cheaper in the world market. The farmers will not get remunerative prices of their products. This will affect the production of oilseeds/ pulses in the state. For controlling such situation, developed countries should reduce the quantity of subsidy on agricultural produce (oilseed/pulses). By reducing the subsidy, the prices of imported produce will increase and it will be favourable for the state's farmers.

At present, oilfed is not implementing any new scheme except safflower production scheme. A target of 40 lakh tonnes of safflower production is fixed in M.P. By implementing this project, the farmers of the state will get an annual income of Rs 6,000 crores and the nation will get 12 lakh tonnes of high quality edible oil and will generate the employment of 1 crore mandays.

Farmers of the state are not aware of the W.T.O. agreement on agriculture. For this, farmers should be given education and training.

The reduction in subsidy on inputs like seed, fertilizer, pesticides etc will affect the cost of cultivation of the crops. As the subsidy decreases, the cost of production of the crops increases. The cheaper import of agricultural product will affect domestic price of the product and the farmers will be sufferers. The import will adversely affect the prices of oilseeds and pulses in the state.

There is possibility of export of duram wheat and DOC (Deoiled cake) from state. India is small exporter of DOC in the international market, therefore, unable to influence the international market price. The main hindrance (constraint) in the production of exportable crops in the state is lack of better infrastructural facilities.

4.6.12 M.P. State Agro Industries Development Corporation Ltd

This corporation is mainly engaged in supply of agricultural inputs like seeds, fertilizers, bio-fertilizers, tractors, agricultural implements etc. The corporation also owns a large mechanised farm of around 1,370 hectares at Babai in Hoshngabad district. The corporation has recently been named as nodal agency for Agri. Export Zones (AEZs) on behalf of the State Government and it has entered into MOU with APEDA for three AEZs. The corporation has undertaken few other ventures also like apiculture, production of mid-day meal under ICDP and purchase of agri-produce in collaboration with corporate.

The policy of the corporation is to promote agricultural inputs and approved agriculture department schemes, to promote production and use of bio-fertilizers/cultures, to propagate use of agricultural implements and facilitating supplies thereof, to propagate use of biogas and facilitating biogas plants, to promote ready –to-eat foods in the public sector, to promote Agri Export Zones (AEZs) – acting as nodal agency, to promote food processing

industries, to facilitate information, to promote business of agri inputs facilitating distribution, to promote honey-bee keeping programme for increasing crop productivity and to implement government policies with respect to agri business under the directives of Govt. of MP/ Govt. of India.

The thrust area of the corporation is diversification through contract farming, agri-processing and export. Positive opportunities do exist in MP for its premium quality of horticultural and agricultural crops. The threats or discouraging points with respect to farmers of M.P. are that the farmers may not be able to keep pace with other developed countries for improving quality and productivity.

Very stringent quality management at each stage of production , post harvest packaging and marketing are required to make state's produce to stand with the test of international quality.

Three Agri-Export Zones (AEZs) have been set up for 6 crops covering 17 districts of state for enabling farmers to face the global challenges confidently. In these zones, the produce will be meant exclusively for export purposes. To achieve this, scientific farming, efficient post harvest technology, bio-fertilizer and bio-pesticides inputs and quality packaging is required. Madhya Pradesh is the first state in the country where Govt. of India has sanctioned agri-export zones for highest number of crops. These crops are potato, onion., garlic, seed spice-coriander, methi (fenugreek) and wheat (duram and sarawati).

AEZs	Agri. Product	Selected districts
1.	Potato, Onion, Garlic	Indore, Dhar, Ujjain, Dewas, Mandsaur, Neemuch, Ratlam, & Shajapur.
2.	Seed spice-Coriander, Methi (Fenugreek)	Ujjain, Ratlam, Mandsaur, Neemuch, Shajapur, Rajgarh and Guna.
3.	Wheat- Duram and Sarawati	Neemuch, Mandsaur, Ratlam, Ujjain, Dhar, Shajapur, Dewas, Indore, Bhopal, Sehore, Vidisha, Raisen, Hoshngabad, Harda, Guna and Narsingpur.

Agri-Export Zones will provide opportunities to the farmers of the state to produce exportable varieties besides entrepreneurs to set up processing units and widening the export opportunities.

Imported product is indentified independently in the market. However, the prices of imported products are cheaper to the domestic products.

Some more Agri-Export Zones are under consideration for pulses, oranges, banana, and non GM soybean.__**The constraints in export of agricultural products/ crops** may be i) poor quality and productivity, ii) handling in sorting, grading, packing and movement in the markets. iii) lack of cold chain infrastructure, and , iv) lack of specialised transport.

With regards to IPR (Intellectual Property Rights) M.P. agriculture policy does not have adequate provisions for patenting domestic products . Thus, IPRs are not protective.

4.6.13 M.P. State Agricultural Marketing Board (Mandi board)

The Board works for welfare of farmers and traders through the establishment of Agricultural Produce Marketing Committees (APMCs). These committees are run by the elected representatives of the farmers and a lone elected representative of the traders. The board has taken effective steps to augment its infrastructure facilities and procedures to protect the farmers interest and enable them to meet the challenges of future as well as benefit from the available opportunities, adopt the latest techniques for marketing so as to keep pace with the developments taking place in view of globalization of the trade. Launching of Mandi Board's website i.e. **www.mpmandiboard.com** in Hindi and English, computerisation of marketing yards and establishment of infrastructure for e-trading (E-Agricultural Marketing in Madhya Pradesh "EKVI" project), educating the farmers, their representatives, legislators, parliamentarians, policy makers and concerned citizens with the specific focus on the implications and impact of WTO agreement on agriculture by launching another web site i.e **www. kisanwatchwto.org.**

WTO agreement would provide an opportunity for state agricultural produce, to find international market. At the same time it would provide threats of large scale imports at a cheaper rate.

4.6.13.1 Points of dispute with WTO agreements

It’s a common knowledge that the points of dispute between the developed and developing nations is the protection in the form of subsidies extended by the developed

nations to its farmers vis a vis the pressure being mounted by the developed nations on the developing nations to cut the subsidies. Developed nations which already have a comparative advantage of high productivity are suggesting the developing nations for raising productivity in agriculture so as to render themselves. This is being suggested when it is known that "investment subsidies" fall outside the purview of WTO discipline and to increase productivity investments in the infrastructure have to be made by the developing nations, the financial resource for which is scarce.

It is also envisaged in WTO agreement that agri-export from developing countries would increase to developed countries when developed countries could lower their domestic support and export subsidies but the results have not been so. Hence, the protection under the WTO regime is for the developed nations and not for the developing nations and this as yet remains the biggest dichotomy.

India before opening up its domestic market for industrial and consumer products for developed countries should have made it conditional in relation to developed countries opening their market for agricultural products for developing countries.

Now India should negotiate for itself the right to maintain some quantitative restrictions on imports and provide some subsidy for exports, using arguments in favour of "food security" and livelihood boxes. This is particularly necessary as, given financial constraints, India would never be able to match the subsidy provision capabilities of the developed countries, that would exploit the "blue-box" and "green-box" loopholes, that keep subsidies out of the estimate of the aggregate measure of support, to protect and support their farming communities.

4.6.13.2 In view of the provisions of WTO, the positive/ opportunities/ encouraging points with respect to farmers of Madhya Pradesh

Farmers of M.P. have opportunities in export of soybean, soyameal, pulses, onion, garlic, potato and spices. Yet, no-real support has been provided to a state like M.P., to emerge as an important international player.

M.P, would need support not merely for building brand loyalty through marketing efforts in world markets, but in the form of investment support for an agricultural export processing zone (EPZ), complete with investments in post-harvest technologies, including

processing, storage and transportation, as well as export certification in line with acceptable SPS norms, that would help add value to its products.

4.6.13.3 The threats/ negative/ discouraging points with respect to farmers of M.P.

Madhya Pradesh in spite of having advantage in export of agricultural commodities would find it difficult to export due to high level of domestic support being provided by developed countries. The international prices of these commodities are lower than domestic prices, due to which the commodities instead of findings their way in the international market find their way into the domestic market, which in turn deprive the farmers to get a higher price of their produce.

4.6.13.4 Initiatives taken in response to the WTO agreement to boost up trade sector of the state

In response to WTO agreement, the state government has made amendment in the Madhya Pradesh Krishi Upaj Mandi Adhiniyam (act) to incorporate :-

i) Contract farming.
ii) Establishment of purchase centres outside market yard.
iii) Provision of single licence for entire state.
iv) Development of private market yards.
v) Constitution of Bureau of Agricultural Produces Standards.
vi) On line Agricultural Marketing "E-Agricultural Marketing in M.P. "EKVI" project. (pilot project is under trial stage).
vii) Platform provided in the form of a website **www.kisanwatchwto.org** for the benefit to the farmers, their representatives, legislators, parliamentarians, policy makers and concerned citizens with the special focus on the implication and impact of the GATT Agreement on Agriculture implemented by WTO.
viii) Launching of mandi board's website i.e. **www.mpmandiboard.com** in Hindi and English, to provide day to day information of markets in relation to prices, arrivals and disposal of the produce, and
ix) Computerisation of marketing yards.

State agricultural policy with special reference to the WTO agreement should be pro-farmer, helping them in producing agricultural produce at minimum cost. The farmers should be insured for their crops, price and return rather than pro-trader.

4.6.13.5 Probable issues that the State may face in view of WTO agreements

Identify agricultural commodities in the State in which the state has comparative cost advantage in production, quality, processing, marketing and logistics.

Measures to be taken to deal with such issues

i) Create international level infrastructure for cultivation and agri-marketing (Storage, grading, packaging and transportation).

i) formulate, implement and constantly evaluating farmer and agri-industry friendly policies.

4.6.13.6 Farmers awareness about WTO agreement

At this stage, WTO is too complex subject to understand for an ordinary farmer. None the less, we should keep trying for making more aware farmers about the broad features of WTO.

Literacy per se and exposure to the IT are the main constraints in educating the farmers. Agri-Export Zones (AEZs) (nodal agency is M.P. Agro Industries Corporation) and **www.Kisanwatchwto.org** and **www.mpmandiboard.com** web sites are slowly and steadily spreading the awareness.

4.6.13.7 Employment & income generation of Farmers

The schemes launched in respect to W.T.O. agreements will generate the employment and income of the farmers but how much, it is too early to make any comment on this issue.

4.6.13.8 Impact of reduction in subsidy on inputs like seed, fertilizer, pesticides etc.

The reduction in subsidy on inputs will adversely effect the production of agricultural commodity. It will increase the cost of production of commodities.

4.6.13.9 Impact of imports of agricultural products

In general imports are allowed by the Govt. of India when there is shortage in the country and availability is monitored by the cell especially constituted in the Ministry of Commerce, Government of India. The import of agricultural produce when availability

through domestic production is plentiful in the country would depress the price of domestic agri-produce.

Imports would augment availability of the commodity which is in short supply. It may have an inflationary effect on the prices of such commodities which are available in abundance.

4.6.13.10 Constraints in Export

As per common knowledge we perceive that M.P. is a land-locked state, which has no dry port or international airport, which could be one of the major constraints for export. Non-existence of better marketing infrastructural facilities is also a constraint.

4.7 Measures taken by the State Government and other departments in response to WTO agreement on agriculture

The following measures have been taken by the state agriculture department and other related departments in response to WTO agreement on agriculture.

1) State Govt. has started a scheme under macro-management titled "Development of Sustainable Agriculture". For this scheme one village from each block has been selected as "Bio-village". Besides, on government farms, 50 per cent of the cultivated area is being devoted to organic farming. State Govt. is developing 1,500 villages of the state as "Bio-villages". It will protect the environment from getting polluted due to excessive and unsystematic use of agricultural chemicals. The results achieved so far are encouraging.

2) To boost the agricultural produce exports, state government has already declared Malwa region as "exclusive agricultural zone", where the produce will be meant exclusively for export purposes. To achieve this, scientific farming, efficient post-harvest technology, biofertilisers and bio-pesticides inputs and quality packaging is required.

   Three Agri Export Zones (AEZs) have been set-up for 6 crops covering 17 districts of the state for enabling farmers to face the global challenges confidently. Madhya Pradesh is the first state in the country where Govt. of India has sanctioned agri export zones (AEZ) for highest number of crops, such as, potato, onion, garlic, seed spice-coriander, methi (Fenugreek) and Duram wheat (Table 4.1).

Table 4.1 Three Agri. Export Zones (AEZs) and selected districts

S. No.	AEZs and Agri. products	Selected Districts
1	Potato, Onion, Garlic	Indore, Dhar, Ujjain, Dewas, Mandsaur, Neemuch, Ratlam and Shajapur.
2	Seed Spice-Coriander and Methi (Fenugreek)	Ujjain, Ratlam, Mandsaur, Neemuch, Shajapur, Rajgarh, and Guna.
3	Wheat (Duram and Sarawati)	Neemuch, Mandsaur, Ratlam, Ujjain, Dhar, Shajapur, Dewas, Indore, Bhopal, Sehore, Vidisha, Raisen, Hoshngabad, Harda, Guna and Narsingpur.

Some more Agri-Export Zones (AEZs) are under consideration for pulses, oranges, bananas and non GM soybean.

3) In response to WTO agreement, M.P. State Agricultural Marketing Board (Mandi Board) has developed a website i.e. **www.mpmandiboard.com** in Hindi and English, to provide information of daily arrivals and prices, and the latest information related to markets for the state farmers.

4) Mandi Board provides a plateform in the form of a website **www.kisanwatchwto.org** for the benefit to the farmers, their representatives, legislators, parliamentarians, policy makers and concerned citizens with the special focus on the implications and impact of the GATT agreement on Agriculture implemented by WTO.

5) Computerisation of marketing yards.

6) On line agricultural marketing "E-Agricultural Marketing in MP. "EKVI" project (Pilot project is under trial stage).

7) The State Govt. has made amendment in the Madhya Pradesh Krishi Upaj Mandi Adhiniyam (act) to incorporate,

   (i) Contract farming
   (ii) Establishment of purchase centres outside market yards.
   (iii) Provision of single licence for entire state.
   (iv) Development of private market yards, and ;
   (v) Constitution of Bureau of agricultural produces standards.

8) To organise **Kisan Melas** in the selected districts of Madhya Pradesh. Agricultural scientists will train the farmers in new technologies like bio-fertilizers, bio-pesticides,

bio technology and improved seeds. This will prepare them to fight challenges ahead in agricultural sector in the light of new WTO regime. Last year Kisan Mela was organised in the 60 places of the state.

9) To provide financial assistance to the farmers, in case of crop failure due to natural calamities; National Agricultural Insurance scheme has been launched in the state.

10) Annapurna and Surajdhara schemes have been started throughout the state for the welfare of the farmers belonging to the scheduled castes and scheduled tribes. The main object of the scheme is to encourage these farmers to provide the certified seeds, adopt cultivation of oilseeds and pulses replacing millet crop.

11) The initiative launched in June, 2000 by Indian Tobacco Company (ITC) popularly known as e-Choupal, and Soya-Choupal for MP project will benefit farmers through realisation of higher farm gate prices.

12) "Kisan Bandhu" scheme is implemented in the state for providing the new information to the farmers about farming, horticulture, livestock, poultry and fishery etc. Under this scheme, one member of the village is trained. This time, about 50 thousand trained "Kisan Bandhu" engaged in agricultural extension programme are in the state.

13) Farmers of the state are receiving new technology related to agriculture through "SATCOM".

14) Farmers of the state are getting subsidy in the form of commercial tax on the chemical fertilizer (urea) at the rate of Rs 11/- per bag.

15) Farmers of the state are getting electricity for the irrigation purposes at subsidised rates.

16) State government is giving more emphasis on horticultural crops such as medicinal plants and spices.

17) According to the survey conducted by State Forest Research Institute, about 1985 plant species including trees, shrubs and herbs of 785 genera representing 147 families have been identified in the state.

18) Measures taken to protect the Intellectual property rights (IPRs) with regard to species, the product and its uses :

i) a cell has been created at the Vishwa Vidyalaya (JNKVV) with the mandate to deal with relevant issues as they relate to Intellectual Property Rights, and

ii) two scientists, one each from agriculture and agricultural engineering have been nominated for effective operation of the cell.

19) Elite germ plasm lines of crop species and released crop varieties are being registered with National Bureau of Plant Genetic Resources (NBPGR).

20) Native germ plasm of crop species and medicinal and aromatic plants is being collected and conserved at various research stations of State Agricultural University (JNKVV). Germ plasm accessions of 7,516 lines of crop species and more than 1,000 species of 549 genera of medicinal and aromatic plants are being maintained in the JNKVV.

21) Nature and quantum of assistance given to farmers by the State Government under the measures exempt from reduction commitment "Green Box", for years 1986-87, 1987-88, 1988-89, 1996-97, 1997-98 and 1998-99.

Year	**Amount** (Rs in Lakh)
1986-87	290
1987-88	286
1988-89	281
1996-97	933
1997-98	999
1998-99	1,066

22) Assistance given to agriculture university for promoting research and education and financial provision for Danida aided project for women is continued in the state.

23) National Watershed Development Project for Rainfed Area (NWDPRA) was started in Madhya Pradesh during 8th plan in the year 1990-91 in 385 blocks having less than 30 per cent assured irrigated area.

24) Small tanks, percolation tanks and water harvesting structures are being constructed by the Department of Agriculture under micro-minor irrigation programme.

25) A programme for installation of bio-gas plants under national programme of bio-gas development is being implemented in the state with a view to provide alternative source of energy and organic manures through the biogas residual slurry.

26) Oilseed production programme (centrally sponsored scheme) is operated in all the districts of state and covers soybean, groundnut, sesamum, niger, sunflower and summer groundnut for increasing production & productivity.

27) Government of Madhya Pradesh with 100 per cent assistance of Danish Government is undertaking a programme for providing training and extension service to farm women (MAPWA).

28) The National Crop Insurance is being implemented in the state as per norms fixed by the Govt. of India.

29) To augment ground water storage and control decline of water table, to improve ground water availability and to reduce surface run-off and soil erosion, whole rainfed area of the State will be covered by proposed "New Scheme for Augmentation of Ground Water".

30) State government is encouraging farm forestry and popularising plantation of spices, medicinal and aromatic varieties.

31) The consumption of pesticides (4,500 mt in 1988-89) declined to 1,725 mt in 1995-96 indicating the awareness for environmental pollution and degradation. Although the pesticides are the integral part of modern crop technology, the ill effects were also made known to the farmers of the state.

32) Productive enhancement of livestock through cross breeding and application of biotechnological approaches.

33) Genetic improvement of livestock species of the state by using embryo transfer technology and other related economical techniques.

34) Enhancement of animal productivity by genetic and non-genetic manipulations.

35) Encourage fish seed production and introducing prawn culture in private sector.

36) Fish seed farms and rearing ponds owned by the department will be leased out to unemployed graduates, fishermen cooperative societies etc. for seed production.

37) Strengthening electronic media for better communication and mass awareness.

38) Setting up of Agriculture Technology Information Centre (ATIC) at JNKVV Head Quarter.

39) The Agriculture University (JNKVV) has been at the top for past several years in the list of Universities/ Institutes producing breeder seed in the country.

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CHAPTER- V

AGRICULTURAL POLICY FOR THE STATE

5.1 Policy Approach to Agriculture

The policy approach to agriculture, particularly in 1990s has been to secure increased production through subsidies in inputs such as power, water and fertilizers rather than building/ capital assets. The strategy has run into serious difficulties as the subsidies have become financially unsustainable. Therefore, the proposed strategies for the Tenth Plan and onward are.

1. Focus on raising the productivity of land in a manner which is sustainable over a long period.
2. Bringing the uncultivated wasteland into productive use whether in agriculture or horticulture.
3. Increasing work opportunities and productivity of women farmers.
4. Raising cropping intensity of land which is at present 135 per cent.
5. Enhancing rain water harvesting and increasing the irrigation potential through scientific watershed development .
6. Emphasizing ground water development.
7. Watershed development programme with peoples' participation.
8. Rural and district road connectivity through mandi funds.
9. Strengthening of agriculture research and development system.
10. An increased focus on subsistence crops and technologies in rainfed/dryland areas.
11. Concentrating on marginal and small farmers and on rainfed areas where returns to both capital & labour are high.
12. Diversification of agriculture to meet the enhanced food & nutritional needs.
13. Organic farming would be promoted in the State as organically produced products fetch premium prices in the international market.
14. Biotechnology and farm mechanisation would be given special thrust.

5.2 The Need for a Public Agricultural Policy

Some specific reasons for government intervention in the agriculture sector of M.P. are as follows :-

(1) Predominant place of agriculture in the State`s economy.

(2) State`s commitment to reduce rural poverty and income inequality.

There is need for a public policy to ensure growth with social equity or social justice.

(3) Violent fluctuations in agricultural production , prices & incomes.

Most of the farmers in the state , being small scale operators and poor , can not bear the consequences of fluctuations in the farm output prices and incomes. They need some protection from the adverse effects of free market and niggardly nature. Such protection can be provided only by the government in the form of price support , insurance and credit policies.

(4) Small scattered and unorganised farmers

Due to these characteristics , the farmers have very low or practically no bargaining power vis–a–vis those to whom they sell their produce and from whom they buy their supplies. This results in exploitation on both the fronts-selling as well as buying. This heightens the need for government policies aimed at equalising opportunities , at strengthening the bargaining power of individual farmer and their organisations, and restraining the powerful from exploiting the weak.

(5) Inadequate and poor basic infrastructure in rural areas

Rural areas in M.P. are at a great disadvantage in relation to urban areas as far as provision of basic infrastructural facilities and services such as roads, drinking water, electricity, schools, hospitals, police protection, transport and communication are concerned. As a result, poor villagers are damned, generation after generation, to poor education, poor health, unemployment and poverty. Improvement of their plight requires intensive government intervention.

5.3 Some Guiding Principles of M.P. Agricultural Policy

The following basic principles have been adopted for framing the proposed agricultural policy of M.P.

(1) Assured and adequate income per capita of farmers.

(2) Economic viability and sustainability of agriculture.

(3) The farmers to be the focal points.

(4) Policy to be futuristic in its orientation.

(5) Policy instruments to be specified.

5.4 Certain Thrust Areas and Underlying Issues

The following thrust areas have been identified based on a review of relevant literature available, discussions with Govt. of Madhya Pradesh officials, JNKVV scientists and representatives of farmers.

(1) Ensuring Food and Nutritional Security

Despite the general improvement in food availability, and health and social services, hunger and malnutrition exist in some form or the other in almost every part of the state is not an exception to this general phenomenon . According to an estimate, over 45 per cent people in rural areas and 40 per cent in urban areas of the state live below the poverty line. This figure is well above the national average of 36 per cent and 30 per cent respectively for rural and urban areas. Moreover, infant mortality rate (117 per thousand birth in 1991) is highest in M.P. next to the state of Orrisa. Therefore, removing hunger and malnutrition should form the core strategy for agricultural development in the state and for this achieving food security is necessary.

(2) Farming System`s Approach to Ensure Sustainability of Agriculture

The Govt. of India policy document rightly emphasises the need for achieving sustainability in agriculture. Soil health and water conservation are the dual concerns foremost in the minds of the farmer, the public representative, the civil servant and extension worker scientists and environmentalist alike, Conjunctive use of surface water and ground water, in–situ moisture conservation, watershed development and promotion of micro overhead pressured irrigation systems like drip and sprinkler need active encouragement and government support.

(3) Development of Dry Land Agriculture

(a) Adoption of Watershed approach (watershed development approach)

(b) Provision of cyclical credit to dry land farmers

(4) Wasteland Development & Management

(5) Water Resources Development and Management.

M.P. is reasonably well endowed with water resources. There are nine major rivers flowing through the state. They together generate 66.5 million acre feet (maf) of water every year, of which about 70 per cent could be harnessed for irrigation purposes. Besides this, about 22.3 maf of ground water is also available of which 50 per cent could be utilized for irrigation purposes.

However , the gap between the estimated potential and the potential actually created by major and medium projects till 1999 – 2000 is substantially large. As against the created potential of 20.18 lakh ha. actual utilization is only 10.01 lakh ha. To harness the potential of irrigation , special emphasis needs to be placed on constructing water harvesting structures in the state on a massive scale. What is needed is a series of small check dams on small rivers and rivulets. This approach would provide much needed protective irrigation.

There is urgent need for State Govt. to formulate an appropriate State Water policy providing for conjunctive use of surface water and ground water. The State Govt. has already made a good beginning in this direction.

(6) Special Attention to Marginal & Small Farmers

Marginal and small farmers account for 60 per cent of the total operational land holdings in the state. For ensuring their economic viability , it will be necessary to impart new skills to them and strengthen the traditional skills required for taking up new high – value and labour intensive activities . This can be done by educating , motivating , training and enabling them to adopt the new activities. Many complimentary and supplementary enterprises such as vegetable production , poultry , sericulture , bee – keeping , pisciculture and milk production etc could be taken up by marginal & small farmers.

(7) Regional specialisation in agricultural production

(8) Support prices for farm produce.

(9) Subsidies on agricultural inputs.

Fertilizers and irrigation water are two of the farm inputs that are heavily subsidised at present.

(10) Improving agricultural marketing and promotion of exports of agricultural commodities.

(11) Insurance of agriculture.

(12) Reorienting Agricultural Research

(13) Restructuring and reorienting of the agricultural extension system.

(14) Augmenting public investment in agricultural production base.

(15) Creating an appropriate organisational structure.

(16) Human Resources Development.

(17) Professional Management.

5.5 Mission, Vision and Objectives of State Agricultural Policy

Taking a cue from the exercise undertaken by Government of India to formulate a National Agricultural Policy, the Government of Madhya Pradesh decided to undertake a similar exercise at the state level to not only put its agriculture on a steady growth path but also to take into account the requirement of sustainability. The State intends to promote sustainable agriculture with growing farm incomes, and to specifically address the needs of small and marginal farmers.

Mission

1. To increase the productivity and profitability of agriculture through sustainable means, by the integration of technology with the natural endowments of the State, its geography and climatic factors.

2. To leverage the potential of the agriculture sector to raise the standard of living of the poor and weaker sections of the society whose livelihood is dependent of agriculture viz landless and small & marginal farmers.

3. To invest in and further the reach of education and research and direct application to increase production and productivity in the agricultural sector.

Vision

1. To direct and facilitate M.P. agriculture to emerge as a market oriented, commercially viable and ecologically sustainable means of producing food, feed, fuel, fibre, raw materials and other commodities, such that farmers find it profitable and respectable to do so.

2. The vision of agricultural sector of M.P. aims to ensure food and nutritional security to all, by enhancing the food production through a steady and sustained annual growth of 6 per cent and turn the state into the granary of the country.

3. It also aims to promote growth and prosperity of rural masses through change in crop rotation, diversification to remunerative crops and allied activities and ensure qualitative change in their life with clean and pollution free atmosphere.

Objectives

1. To achieve 6 per cent per annum growth in agricultural output by increasing productivity;

2. To enhance the incomes of all those dependent on the agriculture sector so that all they attain reasonably satisfactory standards of living, including food and nutritional security;

3. To promote sustainable agricultural development through efficient management of land and water resources, using farming systems and watershed development approaches;

4. To provide farmers with appropriate technology, and necessary inputs, services and incentives;

5. To strengthen the cooperative infrastructure to provide easier access to agricultural credit and inputs ;

6. To refocus extension activities to emerge as a potent conveyance to acquaint farmers with market demand and developments in agricultural practices, and the transfer of appropriate technology ;

7. To ensure the involvement of Panchayati Raj Institutions in the decision making process to enhance agriculture production;

8. To modernize and streamline the agricultural marketing and processing infrastructure to make it competitive and ensure remunerative prices to the farmers;

9. To promote increase in exports of those agricultural commodities in which the State has a competitive edge ;

10. To strengthen the Research and Education Infrastructure;

11. To promote cultivation of horticultural crops for enhancing farm incomes ;

12. To Promote Organic Farming;

13. Risk Management

14. To integrate the roles of the core sectors of power and irrigation and their synergies to increase agricultural production.

15. To streamline existing, and introduce, new legislation, where necessary, and to orient the roles of the administrative machinery and the Stakeholders from time to time , to achieve the objectives of this policy.

5.6 Proposed Agricultural Policy of Madhya Pradesh

The policy suggested or exercised by the Govt. of Madhya Pradesh on agriculture is mentioned below.

5.6.1 Land resources

Vast chunks of land (nearly 50%) in the state are degraded and suffer from erosion due to undulating topography, which is full of ranges, hill mounds, narrow valleys and rivers, resulting is excessive run-off of rain water and soil erosion. State falls in the category of fragile eco-system with extensive spread of problematic and degraded soils, excessive dependence on rain fall, poor vegetative cover and rapid depletion of ground water resources.

The vision would lay special emphasis on the following:-

1. Most of these degraded lands would be brought under cultivation by promoting agro-forestry, social forestry and horticulture crops.

2. For reclaiming the ravinous land of Chambal and other river basins, special efforts would be made, as fast as possible.

3. Practices which harm land resources irreparably, damage sources of water beyond permissible limits and pollute atmosphere beyond agreed limits shall be prohibited by enacting suitable legislation.
4. Land under non-agricultural uses has witnessed a continuous increase over time. It should be stopped.

5.6.2 Irrigation

Against the irrigation potential of 102 lakh ha. In the State, the potential developed so far has resulted in net irrigated area of around 55.1 lakh ha. and gross cropped area of 56.7 lakh ha. in the year 1998-99.

The gross area under irrigation works out to nearly 27.7 per cent.

A very large proportion of the same is under wheat (58.3 per cent), while that under gram comes a distant second.

Out of total surface irrigation potential of 20 Lakh hectares created upto1999-2000, the total utilization has been 9.9 lakh hectares, which is just fifty per cent of the total potential created.

This leaves a very wide scope for increasing irrigation merely by increasing the water use efficiency of created potential.

It is also observed that potential utilized in major irrigation projects has remained around 65 per cent, however, it was falling in case of medium and minor irrigation projects.

Thus special attention needs to be paid towards these categories of projects for achieving higher utilization percentage.

Wells and tube-wells are the biggest and fastest growing irrigation source in M.P. which accounts for 65 per cent of net area shown.

This source can further be exploited by harnessing the 3.08 m Ha m ground water available.

The performance of M.P. Agriculture continues to be uncertain due to inadequate availability of irrigation (only 27.7 per cent GCA is irrigated) and heavy reliance on the monsoon.

The rapid development of irrigation is unlikely due to paucity of resources.

As a large number of major/medium irrigation projects are awaiting completion, the focus should shift to the creation of irrigation facilities through minor sources.

The State's irrigation can only be developed to the extent of nearly 67 per cent of the Current Net Sown Area and, therefore, viable alternatives will have to be evolved to make rainfed agriculture financially viable.

5.6.3 Watershed Development Programme

While implementing this programme, the following aspects would be ensured:-

1. Ensuring better coordination between farmers, government functionaries and voluntary organization.
2. Building further expertise in the area of watershed engineering,, particularly hydrology, hydraulics and structural engineering;
3. Ensuring precision planning by using satellite data, and the expertise of other institutions like CSIR, Bhopal.
4. In order to overcome financial constraints, if any, the State shall access to NABARD for credit from its Watershed Development fund (WDF) for treatment of larger areas.
5. In order to make dry land agriculture profitable over a period of 3 to 5 years, and to meet the full credit requirements of farmers, a new cyclical credit policy, on the lines of that Karnataka, would be adopted.

5.6.4 Water Use Management

Following measure would be taken to improve water use efficiency:

1. Improve the water management through water users' participation in irrigation management;
2. Revision of water rates upwards along with improvement in the reliability of the irrigation system.
3. Make available adequate funds for timely completion of ongoing major and medium irrigation projects;
4. The water resources in the state are scarce. They need to be put to efficient and optimum use and conservation. Effective legal framework is required for use and conservation of this resource.

5. Facilitate harnessing of the untapped underground water potential of 3.08 m.Ha. m. available by constructing dug wells and tube wells in areas where ample ground water exists;
6. Ban further exploration of wells and tube wells in the areas which have been categorized as `gray` and `dark`.
7. Increase water use efficiency without adversely affecting the long term productivity of land on which irrigation is practiced;
8. Harness the irrigation potential by constructing series of small check dams on rivers and rivulets to provide much needed protective irrigation;
9. Formulate and appropriate State Water Policy, providing conjunctive use of surface water and ground water and for promoting water users' associations for ensuring judicious use of water and collections of water charges;
10. Promotion of in-situ moisture conservation and watershed development work;
11. Promotion of micro-overhead pressured irrigation systems, like drip and sprinkler irrigation systems;

5.6.5 Power

Availability of enough power for carrying out timely agricultural operations at the time of need is essential, for growth of agriculture. Though, presently State is having short supply due to inadequate generation, however we are hopeful to be self reliant in power generation within next few years. Despite short power supply, the policy will aim to ensure enough power supply for irrigation and other agricultural operations at the time of need by regulating the power supply to other sectors.

For energy consumption which had increased tremendously will remain the key obstacle. For that non-conventional sources need to be harnessed like wind, water, solar based equipments, bullock driven implements.

5.6.6 Agricultural Credit

Keeping in view the requirement of agricultural credit, by the farmers, it is proposed to increase the availability of rural credit for short term and long term needs.

Therefore Policy will be :

1. Efforts would be made to strengthen district central co-operative banks so that they can meet out increasing demands of farm loans.
2. Commercial banks would be encouraged to provide large scale financing in rural sector.
3. Efforts would be made to bring interest rate at minimum level.
4. Every farmer would be provided with Kisan Credit Card by the year 2007 .
5. Credit plan on the basis of proposed cropping pattern of each farmer would be sanctioned for three years. Accordingly cyclical credit policy would be developed.
6. The rural credit institutions should be geared to promote savings, investment and risk management.
7. Micro financing should be promoted as an effective tool for alleviation of poverty. Self Help Groups (SHGs) must be developed as a supplementary mechanism for bringing the rural poor into formal banking system, thereby improving bank out reach and the credit flow to the poor in an effective and sustainable manner.

5.6.7 Soil Testing

1. The soil testing will be done for entire cropped area in every village and fertility maps for all the villages will be prepared. Soil testing will be repeated after every seven years.
2. For carrying out the soil testing, well equipped soil testing laboratories will be established in each district.
3. Agricultural graduates will be encouraged to establish their own soil testing laboratories. For this they, will provided loan and interest on loan will be subsidized from the funds of Agricultural Research and Infrastructure Development Fund established, under Mandi Board.

5.6.8 Seed

1. The present seed replacement rate of four major crops of wheat, soybean, gram and paddy`s respectively 4.77, 5.98, 1.08 and 2.94 per cent. Rolling plan for seed replacement will be prepared in which production of foundation seed would be enhanced annually for 10 per cent cropped areas of each crop. In this programme farmers will be provided only foundation seed (F-2). The farmers will further multiply this seed in to certified level seed. In this way 100 per cent seed replacement rate will be achieved by terminal year of 10^{th} plan.

2. Use of hybrid and improved seed varieties will be encouraged in the state.

3. To supplement the requirement of Breeder and Foundations seed, suitable to specific areas, and for commercial seed production the farms of M.P. State Seeds and Farms Corporation, JNKVV and State Government will be strengthened. In this process participation of private sector will also be encouraged.
4. Seed Growers Cooperative Societies will be formed in large numbers and they will be encouraged to undertake seed production.
5. G.M. Seeds – The introduction of G.M. Seeds in the State will be as per the guidelines of Government of India.
6. Implication of TRIPS in the context of plant varieties potection and farmers right acts 2001 and new seed policy 2002 should be explored.

5.6.9 Increase in Fertilizer Use Efficiency

1. Special emphasis will be given on the balanced use of NPK fertilizers based on the soil testing results and achieve the most favorable consumption ratio from 10:7:1 to 4:2:1 by the terminal year of Tenth Plan
2. It is proposed to increase the per hectare fertilizer consumption from present 33.50 Kg/ha to 70 kg./ha. by the terminal year of Tenth Plan and further increase it to 100 Kg/ha by the year 2020.

5.6.10 Quality Control of Fertilizers

1. Fertilizers and Plant Protection Testing Laboratories will be strengthened and their numbers will be increased at least one in each revenue division to cope up with the increasing numbers of test samples.
2. Every "kisanbandhu" will be provided with a fertilizer testing kit for quick examination of fertilizer quality.
3. Encouragement will be given for establishment of agri-business and agri-clinics.
4. Adequate supply of required inputs will be ensured well before the sowing of kharif and rabi crops at the societies and distribution centres.

5.6.11 Bio-Fertilizers

For maintaining the soil fertility, use of bio-fertilizers will be encouraged. In this direction following steps will be taken.

1. For production of adequate and quality bio-fertilizers and bio-pesticides the establishments of laboratories will be encouraged.
2. Assured and adequate availability of quality seeds for green manuring will be ensured;
3. NADEP and other forms of compost will be encouraged;
4. Vermiculture will be given special emphasis; and
5. Use of blue-green algae in paddy cultivation will be encouraged.

5.6.12 Organic Farming

1. In pursuance to the National Agricultural Policy, the sensitization of farming community about environmental concerns would be given high priority. Balanced and integrated use of bio-mass, organic and inorganic fertilizers and controlled use of agro-chemical through Integrated Nutrient Management (INM) and Integrated Pest management (IPM) would be promoted to attain sustainable agricultural production by launching a State-wide programme.
2. Since nitrogenous fertilizers consumption is proportionately more than the balance use. Therefore, Integrated Nutrient Management for crops should be made popular among the farmers.
3. For testing and certification of organically grown agri-produce, accredited testing and certification facility will be established.

5.6.13 Farm Mechanization

Farm Mechanization aims at promoting use of improved farm machinery to facilitate efficient use of agricultural inputs to increase the productivity of land and labour.

It also helps in reduction of post harvest losses and improvement of quality of farm produce by growing under controlled environment.

The vision would aim at;

1. Improved agricultural implements and technology will be extensively popularized among farmers.

2. Farmers will be provided adequate mechanical farm power to ensure timely completion of farm operations keeping the growth and availability of human and draught animal power. Also availability of diesel and electricity will be ensured in the rural areas to operate the prime movers for economical hours.

3. Special incentives will be provided to the farmers for importation of mechanization equipments for cultivation of commercial crops, such as vegetable planter, harvester, ,grader, greenhouses with automation, low tunnel plastic house, drip and fertigation equipments, sugarcane harvesters, cotton picker etc.

4. The manufacturers will be allowed to import specialized farm machinery which are not being manufactured in the country with financial incentives for accelerated adoption and local production. Joint venture will also be encouraged for the manufacture of such machinery.

5. The farmers and entrepreneurs will be provided credit on easy terms for purchase of improved quality and agricultural machinery for self use and to promote custom hire services to the farmers who are not able to adopt modern agriculture technology on individual ownership basis.

6. Industries will be encouraged through incentives to adopt BIS/ISO technical specification to produce quality agricultural machinery. Appropriate administrative measures will be taken to ensure that quality farm machines/equipments are provided to the farmers.

7. Increasing use of improved machinery will require infrastructure for repair, maintenance and servicing, besides quality machinery at affordable cost. Farmers Training Centres will be strengthened to ensure that farmers/farm women are able to avail training within their district.

5.6.14 Communication

For faster growth of agriculture the policy will place utmost importance on the development of means of communication viz: roads, transport, air service, and information technology etc.

5.6.14.1 Roads

Rural road connectivity is important for rapid growth of agriculture sector. State has already established a "Kisan Road Fund" under State Agricultural Marketing Board where in around Rs. 80-90 Crores are being generated through market fees annually for construction of rural roads. Besides this, roads are also being constructed under PMGSY etc. The policy will ensure that all the villages and mandis are connected by all-weather roads as fast as possible for speedy growth of rural eco.

5.6.14.2 Information Technology

The policy will lay special emphasis on the use of Information Technology in the agriculture sector so that farmers, extension workers, traders etc, are able to get information regarding latest research in agriculture, weather and market information and to provide linkage/connectivity with ICAR, State Agricultural University, APEDA, NHB etc. The system will be broad based to cover all kinds of information. A farmers' advisory service will be started for transfer of knowledge.

Remote sensing and information technology should be strengthen to capture date add value and disseminate it to appropriate destinations for managing the risk and accelerating the growth process.

Increase in cultivated area and cropping intensity

1. Attempts shall be made to increase the cultivated area by converting culturable wastelands, old and current follows into arable lands.
2. The present level of cropping intensity of 135 per cent will be raised to at least 150 per cent by the end of the year 2007 and 200 per cent by the year 2020.
3. Cultivated area cannot be increased to a large extent; however it would be increased marginally to 160.00 lakh hectares from 150.70 lakh hectares.

5.6.16 Increase in Oilseed and Pulse Production

Madhya Pradesh is leading producer of oilseeds and pulses and contributes substantially to national food basket.

Efforts will be made to double the production of oilseeds and pulse by the year 2007 and triple by 2020.

State is first in oilseed and pulse production in the country. Nevertheless, there is scope to increase productivity of these crops in the state. Efforts, therefore, will be made to increase production by one third upto 2007 and double by 2020 by increasing productivity and replacing low value crops with pulses and oilseeds

5.6.17 Crop-Diversification

A good number of crops are grown in the State. Number and area of low value crops is also large. Crops like Kodo-Kutki, Kulthi and other minor millets grown, which are not economical may be replaced with high value crops. Therefore, large scale programme for replacement and diversification of low value crops to high value crops will be taken up.

Large areas in the State is under minor millets which have abysmally low yields. Similarly rice cultivation in upland areas is one of the major reason of stagnated yield.

Diversification of agriculture enterprise is essential for ensuring the regular income and employment. Diversification with livestock, agro-forestry, horticulture and fisheries based production system should be popularized.

A comprehensive strategy for crop diversification will be prepared and by 2007 , all non-remunerative crops will be replaced by remunerative crops.

5.6.18 Building Competitive Advantage :

Madhya Pradesh is having 11 agro-climatic zones. Taking advantage of varied agro-climatic zones, special strategies would be developed for promoting various crops and varieties in particular areas.

1. Organic produced mainly food crops, spices and vegetables, medicinal and aromatic plants for national and international market.
2. Potato for chips and wafers in Malwa Plateau.
3. Durum wheat for fast food in Malwa Plateau, Vindhya Plateau and Central Narmada Valley, for export purpose.
4. Ramtil (Niger) in tribal areas.
5. Garlic and coriander in Malwa and Vindhya Plateau.
6. Medicinal and aromatic plants in different agro-climatic conditions.
7. Quality chapatti wheat for Indian market.

8. Emphasis on precision farming.
9. Soil test based application of fertilizers.

The State would encourage reputed organizations of agri business firms engaged in trading and agro-processing to take over the responsibility of developing the linkages between the farmers and markets.

5.6.19 Extension Services

Prevalent system for training and visit (T&V) has played important role in bringing green revolution in country as well as in the State of Madhya Pradesh. Now with changing demand, developing advance technology and requirements in the field there is needed to revamp Agriculture system as a whole. Information/ knowledge based agriculture is the demand of present and further agriculture in competitive world of agriculture

1) Existing agriculture system be diverted towards technology transfer instead of inputs supplies and subsidy distribution.
2) In order to promote group Extension, formation and active involvement of self help groups (SHGs) in promoting agriculture extension.
3) Developing paid services in respect of Agriculture extension..

For many years agriculture extension was considered the monopoly of the public sector.

However, with the wide range of demands for agricultural technology, in the changing scenario, there is growing recognition that public extension by itself cannot meet the specific needs of various regions and different classes of farmers.

Therefore existing public extension system will be quickly revamped by taking following steps :

1. The existing public extension system would be replaced by multi-agency extension system
2. The private business houses who are willing to undertake the extension work, would be involved in this venture on the lines of M/s Dhanuka Group undertaking the extension work in Hoshangabad district;

3. The "Kisanbandhu" scheme , where in members/presidents of Gram Sabhas have been trained as extension workers, would be further strengthened and capacity building of Kisanbandhus would be an on-going process. These trained farmers would be working as extension workers for dissemination of newer technologies.
4. Training and capacity building of Agricultural staff would be vigorously followed so that their knowledge/skill is updated to meet the present challenge;
5. Training of farmers and farm women would be given top-most priority and it would be an on going programme round the year. Training curriculum would be upgraded in a manner that it is holistic, updated, easy and comprehensive;
6. Role of women farmers would be redefined by placing them in the centre stage of the extension programme;
7. Use of media and information technology for dissemination of improved technology and agricultural messages will be vigorously promoted ;
8. Number of female extension workers would be increased through re-examination of service cadre rules for hidden gender biases.

5.6.20 Training

The policy will place special emphasis on the following :

1. There will be integration and upgradation and modernisation of training centres at district level.
2. One Agriculture Extension Training centres at district level for imparting training to extension workers and farmers.
3. Apex level training centres would be developed at State level.
4. Involvement of agri-clinic and agri-business graduate, NGO`s and other experts in imparting training on hire basis.
5. Top most priority would be given to training of grass root level extension workers, Kisan bandhu, Kisan bahan and farmers.
6. Special emphasis would be given to farm women in training.
7. Training through programmes like, **SATCOM, HELLO AKASHWANI, HELLO DOORDARSHAN** would be used extensively.
8. Private channels would be encouraged to telecast innovative programmes on agriculture.

9. They would be made multi-disciplinary training centres and would be reallocated to different revenue divisions in a manner that every revenue division has minimum one training centres;
10. The training curriculum would be redesigned to meet the requirements of women farmers;
11. Training curriculum would be upgraded and redesigned every year to meet the growing needs owing to fast changing technology;
12. The training would integrate with various schemes of rural development, so that participants are able to take advantage of these schemes.

5.6.21 Women Farmers

It is well known that increase in agriculture production and productivity depends as much on fundamental changes in the process of decision as on availability of improved technology and availability of agricultural inputs.

It is therefore essential to include farming community and particularly women in all development programme as participants.

In Madhya Pradesh women play a major role in agricultural activities, however their participation in departmental training and extension programmes is limited.

In this context, following points will be kept on high agenda :

1. To attempt to bring about the participation of 50 per cent women farmers in all training and extension programmes;
2. To protect the rights of women in relation to ownership of land and related agricultural activities;
3. To ensure adequate representation of women in various decision making bodies;
4. To ensure appointment of 30 per cent women extension officers in all future recruitments.

5.6.22 Horticulture

M.P. occupies only 1.8 per cent of the total area under fruits in the country while, in the case of vegetables, the area share is 4.3 per cent. Interestingly, in terms of fruits productivity, M.P. with the average productivity of 22.8 MT/ ha is only next to Tamilnadu

(25.6 Mt/ha), while its average productivity in vegetables is 14.0 MT/ha. which is in the middle range. However, M.P. has a significant presence in spices, where its share in the national area is 12.4 per cent.

Opportunities in Horticulture

As far as the horticulture is concerned, it currently occupies only 2 per cent of the gross cropped area of the State.

Table 5.1 Production of Major Horticulture Produce

(Area in Million Hectares)
(Production in Million Tonnes)

Name of Crop	Area	Production	Production (% Share)
Fruits			
Mango	0.0166	0.15	9.80
Guava	0.0071	0.14	9.15
Citrus	0.0118	0.19	12.4
Banana	0.0238	0.96	62.7
All fruits	0.0673	1.53	100.00
Vegetables			
Potato	0.0620	0.81	22.3
Onion	0.0275	0.37	10.2
Tomato	0.0346	0.52	14.3
All Vegetables	0.2587	3.63	100.00
Spices			
Chilli	0.049	0.05	16.1
Garlic	0.037	0.15	48.4
Coriander	0.197	0.08	25.8
All Species	0.330	0.31	100.00

Generally , the production of horticultural crops is thinly spread throughout the State but some pockets of concentration do exist and offer potential for further development. However, any horticulture development programme must be accompained by the creation of markets, both in terms of physical infrastructure and consumer demand. Any attempt to increase agricultural production and more particularly horticultural production without market development is bound to fail. In this context, the existing and potential pockets for horticultural growth in M.P. are presented in table 5.2.

Table 5.2 Potential Horticultural Crops , Regions and Areas of Concentration in MP

Potential Crop	Region	Existing Concentration
Banana	Nimar Plateau	Khargone, Khandwa
Citrus	Satpura , Malwa	Chhindwara
Guava	Grid , Bundelkhand	
Coriander	Grid , Malwa	Guna , Mandsaur
Potato, Garlic	Malwa Plateau	Indore

1. The sustainable development in agriculture would be achieved by diversifying the existing cropping systems to horticulture and agro forestry.
2. Non-forest wastelands which otherwise can not be brought under crops, would be used for horticulture.
3. According to the 2000-01 figures, 35 Lakh tonnes total Vegetables and 17.40 Lakh tonnes total fruits are being produced in the State. State would aim to double the production of fruits and Vegetables, by the year 2007.

To achieve these targets, the following actions would be taken :

1. Nursery act would be enacted to facilitate availability of quality planting material.
2. Arrangements will be made for sufficient production of disease free and high quality planting material;
3. Appropriate technology , suitable for different agro-climatic zones, will be developed and farmers will be encouraged to adopt them;
4. Cultivation of Malwa potato, which has immense potential for value addition and export would be promoted and its area and productivity would be increased;
5. Traditional horticulture crops will be extended to new areas ;
6. Use of hybrid vegetables seeds and plants developed by tissue culture, would be promoted ;
7. Financial incentives would be provided to horticultural co-operative societies for establishing of storage and processing facilities.
8. Effective marketing of horticulture products will be ensured ;
9. By use of modern techniques, unproductive and old orchards would be made productive;

10. Farmers would be provided liberal financial assistance for planting fruit bearing plants in the non-forest wastelands for 3 to 5 years till the plants start fruit bearing;
11. State government will promote creation of facilities of cold storages, cold chains etc.
12. Export of horticulture produce would be encouraged; farmers would be encouraged for cultivation of spices, medicinal and aromatic plants ;
13. Co-operative sector food processing units would be provided financial incentives in terms of interest subsidy on loans;
14. Traditional areas of flower cultivation will be identified and floriculture will be developed to meet domestic demands. Efforts would also be made for exports.

Market information, new technology and export potential in the international market for flowers, will be made available to entrepreneurs.

Drip irrigation in horticulture crops will be promoted and for this liberal financial assistance shall be provided.

The average yield/ha. of many several fruits like Guava, Banana. Citrus and many vegetables has been shown to be substantially higher than the all India average in the State records. Where as some farmers may get even more than the production indicated in these records.

Our main object is to increase production and productivity of different horticultural crops (Fruits, Vegetables, Spices, Floriculture, Medicinal and Aromatic plants.) and thereby improving the economic condition of the farmers.

To achieve this object following action plan is suggested :

(1) Production of quality planting material :

a) Strengthening of departmental nurseries.
b) Quality control over private nurseries.
c) Amendment in present seed Act giving power to Horticulture Department for horticultural seed and other planting material.
d) Establishment of nurseries at village level by farmers especially by women.
e) Establishment of laboratories for quality control of planting material as well as produce for export.

(2) Production and Productivity of Horticultural Crops :

a) Identification of horticultural crops for rain fed and irrigated conditions for different crop zones for local market and export purposes.
b) Follow up of cluster approach.
c) Intensification of crops grown in different zones by adopting package of practices through demonstration for increasing productivity and improving quality of produce specially for export purpose.
d) Increasing cropping intensity by multiple cropping, inter cropping etc.
e) Identification of horticultural crops and their package of practices for dry land/rain fed horticulture.
f) Production of horticulture crops for export purposes.
g) Organic horticulture with special reference to rain fed horticulture and also under irrigated conditions.
h) In situ, ex-situ conservation of bio diversity in horticultural crops.
i) Identification of potential areas for horticultural crops in the state.
j) Cost effective marketing channels and low cost storage techniques for horticultural crops be identified.

(3) Research

a) Evaluation of newly introduced crops/ varieties/ hybrids under rainfed and irrigated conditions.
b) Standardization of package of practices for horticultural crops.
c) Organic farming of horticultural crops.
d) High-density orchards.
e) Plant protection measures.
f) Suitable forestry plant for marginal and degraded soils.
g) Transfer of technology to field staff by scientists and extension workers.
h) Inter institutional linkages on technical and scientific matters.

(4) Processing

Processing and even utilization capability is insignificant. Processing Industry is facing many problems

a) Lack of linkages between growers & processors.
b) Poorly organized production system which does not take into account the special requirement of processing industries.
c) High index of taxation.
d) Non availability of raw material.
e) Poor consumption base and sale of the products.

5.6.23 Agro-Forestry

Some new thinking is leading to emergence of agro-forestry as a means of improving the productivity and profitability of less productive and degraded lands. Agro-forestry means growing trees on farms to improve livelihoods and protect the environment.. Such agro-forestry systems are important to conserve the top soil and its moisture content required for success of any cropping system. If successfully adopted, this alternative may prove relatively more attractive from the viewpoint of meeting fuel and fodder requirements of growing population, which continues to remain dependent on natural forests and vegetation.

A Design and Diagnostic (D&D) survey of agro-forestry conducted in four agro-ecological regions of the State covering 27 districts revealed the following :

1) Majority of the farmers have small holdings and more than 20 per cent are landless ;
2) Only medium and large cultivators rear cattle (2-3 cattle/family) ;
3) Controlled grazing system is followed between july to March :
4) Barely 10 per cent of the farmers follow controlled grazing throughout the year.
5) Straws of wheat, paddy, jowar, maize are usually used as fodder;
6) Only 1-2 per cent of the farmers grow and use improved fodder crops like berseem, lucerene, and MP chari;
7) In a few pockets, leaves of pipal, bur, mahua, koha, ber, and subabool are used as green fodder. About 36 per cent of the farmers face the shortage of green fodder ;
8) For fuel usually wood, twigs of lantana ipomea, til and tur are used. Of the total fuel used, approximately 73 per cent is contributed by firewood, 15 per cent cow dung and 12 per cent by straws and stubbles. Maximum quantiity of firewood is collected from nearby forest by either purchasing cartloads, head loads or collected from nearby fuel wood depots ;

9) Hardly 42 per cent of farmers use small timber/wood grown at their own farm for farm implements. Usually shisham, sal, khair, amaltas, and ber trees are used. About 20 per cent of the farmers purchase small timber from local markets; and
10) About 50-60 per cent of farmers have trees planted on bunds, and farm boundaries.

The above observations clearly indicate that there is shortage of fuel and fodder to the extent of 50 per cent. In spite of these shortages, the villagers living in the fringe of forests are not eager to grow trees on their farms and to adopt any agro-forestry system. Only those villages which are away from forests showed interests in agro-forestry on wastelands. Agro-forestry systems comprising horticultural crops, and woody perennials either with vegetables or with shade loving crops or with floriculture are in great demand, if technically and financially supported (Awasthi,et.al.2000). The survey results do reflect the farmers' reservation in adopting agro-forestry systems because of the hurdles and hassles involved in the sale of wood and timber

However, on the whole, the production of fuel, fodder and wood/timber in the state is far short of the demand. Agro-forestry can be a means to bridge this growing demand- supply gap and emerge as an attractive diversification option for the farmers. The small farmers can adopt this alternative with multi-purpose tree species. However, as the above survey brings out, farmers would not be willing to adopt this alternative until the restrictions on the sale of this product category are removed. In order to promote this attractive diversification alternative, it will be necessary to form and strengthen producers` co-operatives like the tree growers cooperatives organized by the National Tree Growers` Co-operative Federation Ltd. (NTGCF) and remove regulatory and market barriers, which limit the adoption of commercial agro-forestry.

In view of the facts and viewpoints presented above, the agro-forestry is likely to provide viable alternative to horticulture for diversification. Considering the merit of each alternative, in terms of future potential and benefits, both seem to be acceptable options. But agro-forestry offers much larger potential as compared to horticulture. If implemented properly, it will facilitate the growth of Rural Non-Farm Sector (RNFS) using the `resource` based approach as against the 'skill' based approach.

5.6.24 Allied Activities – Live Stock and Fisheries

1. Efforts shall be made to promote concept of mixed farming where in along with agriculture allied activities relating to Dairy, Poultry and Pisciculture shall also be taken up.
2. Conservation and Improvement of appropriate breeds of cattle, poultry and fisheries shall taken up in a big way.
3. Special attention shall be given for feed and fodder development programme.
4. Modern practices such as stall feeding of cattle shall be promoted.
5. Number of unproductive animals will be reduced by taking up the massive programme of castration of scrub bulls.
6. Milk production of the state would be doubles by the year 2007.
7. Animal health care services shall be promoted
8. Apiculture shall be promoted on a large scale in the State.
9. Development of all the state water bodies so as to get sustainable fish yield per unit area.
10. Increase fish production to achieve self sufficiency.
11. Investment for setting up essential infrastructural facilities and upgrading the present facilities.
12. Popularize viable aquaculture practices to improve rural economy
13. Empowering / fishermen societies to improve their socio-economic conditions.
14. Facilitate marketing of fish produce from small village tanks to encourage and develop entrepreneurship in rural areas.

5.6.25 Research and Education :

University

The Jawaharlal Nehru Krishi Vishwa Vidyalaya at Jabalpur is the apex state Agricultural University with 6 Agricultural Colleges, 1 Agricultural Engineering College, 2 Veterinary Colleges, 1 Horticulture College , 9 Agricultural Research Stations and 11 Research Centres/ Sub Centres spread all over the State. This infrastructure is used to carry out basic and applied research and agricultural education. In addition, the State has 19 Krishi Vigyan Kendra`s (KVK's) to undertake first-line extension activities.

Traditionally, Madhya Pradesh is endowed with the rich biological wealth and this stock of bio-diversity has contributed greatly in the specific agro-climatic conditions. This natural wealth needs to be protected and promoted.

In view of Agreement of Agriculture (AoA) under WTO and globalization, awareness about patents and rights of breeders has made it essential that the State not only saves its genetic wealth, but also protects its rights to safeguard the interest of its farming community.

The vision will place special emphasis on the followings :

1. Ensuring qualitative improvement in agricultural education to bring it at par with international level ;
2. Economic viable and sustainable crop production technology should be disseminated on farmers fields. Research on economics of crop production technologies, comparative profitability, yield gap and interplay of various constraints should be explored.
3. Consequences of WTO on State agricultural economy.
4. Research on crop diversification and risk management.
5. Agricultural research will be made farmers oriented so that it can generate profitable technologies suitable for various agro-climatic and socio-cultural conditions ;
6. Agricultural research on developing disease free and high yielding varieties will be emphasized ;
7. Development of suitable farm machinery for scientific agriculture will be promoted.;
8. The market/demand orientation will be made integral part of research programme ;
9. The J.N.K.V.V. will adopt one village every year in each agro-climatic zone where suitable extension work would be undertaken intensively to demonstrate the efficacy of improved technology ;
10. Traditional biological wealth of different agro-climatic conditions shall be catalogued and would be protected to ensure its genetic purity.
11. The Agricultural Research & Development Fund created out of market fee would be fruitfully utilized for carrying research in agriculture and allied sector and creating suitable infrastructure for research ;

12. An autonomous council on the lines of U.P. Council of Agricultural Research (UPCAR) would be created to give clear and focused direction to the agricultural research.
13. State shall support biotechnological research and place greater emphasis on adaptive research in the short run from Mandi R & D Fund.

5.6.26 Agriculture Marketing :

The State consists of a network of 460 regulated markets (229 mandis and 231 submandis) spread over 45 districts. Out of these, 24 mandis have been developed the fruits and vegetable markets also.

The network further extends to 1,312 weekly bazaars in rural areas, called haats. But such haats have hardly any physical infrastructure.

The following activities are proposed for the future:

1. Market regulations would be simplified with a view to be more user friendly and transparent.
2. Each mandi samiti will adopt at least one village every year. The Mandi Samiti will undertake the construction of community biogas plant in the adopted village and will provide light and cooking gas facilities to the village community on its own cost. This will result in overall development of 229 villages every year in terms of lighting and cooking facilities.
3. Contract Farming of selected crops would be encouraged for their convenient and smooth marketing with the provision of dispute settlement at the local level;
4. Facilities will be developed to provide 75 per cent cash loan to the farmers by pledging their produce on easy terms in anticipation of getting better price of their stored produce at Mandi and Sub Mandi sites against warehouse receipts under Negotiable Instruments Act ;
5. Given the State's cropping pattern, the policy will activate commodity exchange for trading in oilseeds and pulses ;
6. Direct marketing of fresh produce would be promoted in order to increase incomes to farmers and benefits to the consumers on the lines of **Apni Mandi** in Punjab, **Rythu Bazar** in A.P. and **Uzhavar Mandies** in Tamil Nadu;

7. Human resource development will be given special attention to bring the overall improvement in the quality of services being offered by the Mandi Board.
8. Cooperative institutions would be encouraged to set up their own markets and for this suitable amendment will be made in the APMC Act.
9. Information technology enabled mandi operations would be established to increase the reach of mandis, enable (real time) information dissemination so as to empower the farmers with the latest information on agricultural marketing and in turn create an infrastructure for e-commerce through mandis.
10. Special emphasis would be given to develop specialized market yards to meet the specific requirement of niche markets such as flowers and perishable commodities.
11. Reorganize the working of mandis by preparing the State Master Plan to ensure benefit of a regularized marketing to maximum agricultural produce of the state.
12. Promote Agricultural research & Infrastructure Development in the state by providing financial assistance.
13. State private partnership would be encouraged for ;
    a) Establishment of value addition infrastructure such sieving, sorting, grading, drying & packaging, etc.
    b) Establishing specialized godowning (e.g. cold stores, cold chains etc.).
    c) Establishing infrastructure for promoting future trading practices such as e-commerce, electronic weighing, e-trade exchanges etc.

This will ease the paucity of funds in the marketing sector.

5.6.27 Value addition-Agricultural Exports

In order to promote agri-export, the vision will concentrate on following ;

1. Regional identification of the crop enterprise which are having comparative advantage should be focussed and special agri export zones should be formulated accordingly.
2. Post harvest technologies which minimise the losses and value addition to farm product. For that there is need for judicious planning of human resource development in agriculture and allied sectors.

3. Contract farming would be promoted for different commodities and for this suitable amendment will be made in APMC Act;
4. In order to enhance the agri-export; agro-based horticultural, floricultural and processing industries will be designated as thrust sector.
5. Adequate training will be provided to producers, processors and exporters etc. on quality production, pre and post harvest, management etc;
6. Exemption will be given from payment of commercial taxes on the agri-raw material and their processed products used for export;
7. Phyto-Sanitary testing facility will be established.
8. Information mechanism for getting information of International markets and possibilities of export will be developed ;
9. Research and Development activities for evolution of exportable and disease free varieties will be encouraged;

5.6.28 Agri Export Zones (AEZs)

Certain commodities grown in Madhya Pradesh have immense export potential. In order to tap this opportunity, the state has entered into MOU with APEDA for three Agri. Export Zones. One AEZ is for potato, onion and garlic for Malwa region, the another is for seed spices viz. coriander and fenugreek covering seven districts of Gwalior and Ujjain divisions. The third AEZ is for durum wheat covering 13 districts of central and western Madhya Pradesh.

State grows good quality of pulses and oranges in large area and these two commodities too have immense potential of export. Therefore, efforts are being made to get 2 more AEZ on these commodities.

The policy will lay emphasis on success of these AEZ by taking following steps;

1. growers of these commodities will be educated and trained in producing, grading and packing of this produce for overseas market.
2. Necessary infrastructure like electricity, warehousing, grading, sorting, packing, cold storage etc, will be created, in time bound manner, in AEZ areas, by obtaining central assistance, Investments from entrepreneurs will also be encouraged.
3. Facilities of quality certification will be created by State Government

5.6.29 Sugar Industry

Area under sugarcane in the State is 57,000 hectares with 2,19,000 metric tonne production. The yield rate is 3,860 Kg/ha. which is just 55 per cent of the national productivity. There are 11 sugar mills in the state, out of these 6 are in cooperative sector, one is under Commerce & Industries Department and 4 mills are in private sector. At present only 6 mills are in production and 5 are closed. Barring two mills, one at Burhanpur; and the other at Ghatwa, all other mills are loss making. The major reasons of sugar mills going in loss, is the insufficient area of sugarcane being grown in the reserved area of mills, insufficient irrigation, management and unabated growth of illegal "Khandsari" and "Sugarcane crushing units".

To bring the Sugar Industry in profit, the policy will aim at:

1. Increase irrigation in the mill areas ;
2. Encourage use of drip irrigation by giving liberal financial assistance ;
3. Increase the sugarcane area by aggressive extension work ;
4. Ban the illegal "Khandsari" and "Gud" units effectively in the reserved area.
5. Undertake research and introduce disease free and high yielding varieties of sugarcane.
6. Introduce appropriate production technology to get higher recovery ;
7. Improve management of mills ;
8. Undertake the modernization of mills.

5.6.30 Legislation

Following acts are in operation in the State.

1) The Insecticides Act 1968.
2) The Fertilizer (Control) Order 1985.
3) The Seed Act (1966).
4) MP Sugarcane (supply & purchase) Act 1958.
5) MP Sugarcane (supply & purchase regulation) Act 1959.
6) Mandi Act.
7) Jawaharlal Nehru Agriculture University Act.

Suitable amendments to these acts shall be made to further the aims and objectives of this policy.

It is proposed to have new MP Sugarcane Development Act, New proposed act will bring the sugarcane development and sugar industries under one umbrella. It aims to develop sugarcane and sugar industry in the State.

5.7 Indian /state Agriculture under New WTO Regime

The objectives of the WTO are based on the principles of comparative advantage and global free trade. The WTO`s main function is to ensure that the trade flows as smoothly, predictably and freely as possible. The WTO is a member-driven organization which has no decision making powers of its own; it is simply a forum for negotiations. The objectives are set at the Ministerial Conferences (Singapore 1996, Geneva 1998, Seattle 1999, Doha 2001, and Cancum 2003). Some 145 countries (India is one of them) are currently members of the WTO; more than two-thirds of them are developing countries. The WTO recognizes just three country classifications: all countries, the developing countries (DCs) and the least-developed countries (LD-Cs). As a matter of principle, all countries are treated equally in the WTO.

Economic reforms and liberalization process particularly under the WTO regime have thrown many challenges to all sectors of economy. In the early 1980`s, India began to liberalise external trade, but it was only in 1991 that the process of liberalization got accelerated. Prior to 1991, India pursued a system of complicated and highly regulated trade regime. To evaluate the potential of Indian agricultural products under the WTO regime, we must attempt to understand this new regime and its implication. The precursor of WTO, the GATT (General Agreement on Tariffs and Trade) , kept agriculture out of its purview. A separate agreement, Agreement on Agriculture (AOA), was negotiated and came into operation from 1.1.95 to address issues relating to trade in agriculture as a part of overall arrangement which also considered unchartered areas like textiles, services and intellectual property rights. The AOA aimed at establishing a fair and market oriented agriculture trading system through substantial progressive reduction in agricultural support and protection, resulting in correcting and preventing restrictions and distortions in world agricultural markets. Recently, Quantitative Restriction (QR.) have been removed from 1st April, 2001.

In edible oil sector government of India removed most of the import restrictions. Soybean was followed in February,1995 on temporary basis subject to meat re-export by private processors. Further exports on sunflower and rapeseed-mustard were allowed in 1995. Working capital restrictions on trade and processing of oilseeds under Selective Credit Control were lifted in 1996. In 1997 storage restriction were removed. In 1998 import of oilseeds was put under Open General License (OGL)*. By July, 1998 the import duty on edible oils was reduced to 10 per cent but political exigency recently forced Government to enhance it again.

The reduction in import duty may increase the import of edible oils and bring down the prices of domestic oils and oilseeds but ultimately will bring down the prices of domestic oilseeds and oil in the country. The dampening effect on domestic prices of oils and oilseeds will make oilseed crops less remunerative as compared to competing crops. This in consequences may change the cropping pattern, affect employment and farm income. Consumers may be deprived of some specific qualities. The poor and small farmers totally dependent on oilseeds based agriculture for their livelihood will be the worst sufferers as most of the oilseeds are either in arid and semi arid areas where income levels of farmers is generally low.

Most importantly, Madhya Pradesh also known as soybean state and large section of the farmers is dependent on soybean, rapeseed and mustard and other oilseeds for its income as well as nutrition. In the absence of such crops this section will become most vulnerable.

As a founder member and signatory to GATT, and a member of its recent reorganisation, the World Trade Organization (WTO), India is committed to dismantling of trade barriers. There is no point on ex-ante debate on whether the provision of WTO are beneficial or harmful to Indian agriculture. How best we can maximum the provisions in WTO to Indian agriculture , what are the emerging issues, options and strategies are available at our end. There are broad areas under which the WTO commitment fall, they all direct and Indirect.

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* Gopal Naik, et.al W.T.O. Competitiveness and Bound tariff requirements of Indian Agricultural Commodities, CMA, IIM, Ahmedabad, May, 2001.

5.8 ASSUMPTIONS – MIRAGE OF WTO

The provision of WTO for agriculture were considered beneficial on the following optimistic assumptions.

1) Increased market access will expand export market for Indian farm products.
2) For certain farm products, India will have lion share in global export, e.g. tea, jute, tobacco, fruits and spices.
3) Diversified agro-climatic conditions and varied production base give India a distinct edge over other developing countries.
4) Reduction in level of subsidies for agril production in developed countries will increase the cost of production and Indian agril products will be cheaper in International market which will increase the export.
5) Production, packaging and processing technologies comparable to those of the developed countries are available in India so that product differential if any can be removed.
6) There will be enough marketable surplus in respect of agriculture commodities for export. It ensures that domestic demand which is growing with population and increase would be satisfactory met with increased production.
7) Profit earned by international trade in agriculture will reach the farmers to provide them with the necessary incentive to increase agril production of the desirable quality and create a marketable surplus for export.

5.9 Ground realities of Indian agriculture

1) About 80 per cent of farmers are marginal and small, hence very little marketable surplus for export.
2) Inefficient production system resulting low productivity for most of crops and globally less competitive.
3) India ranks second in the world for vegetables and fruit production but it contribute only 0.5 per cent of the global trade. Large volume of production does not necessarily imply a large share in the global market.

4) A huge gap between the production and domestic consumption requirements which reveals the absence of any real surplus, on the contrary, need for import of commodities from time to time.

5) It would be naïve to think that India alone would enjoy a virtual monopoly position while the rest of the member countries would be unable to compete

6) Acute shortage of infrastructural facilities like cold storage, transportation, electricity, credit and other facilities at all level is an axiomatic truth in India-agricultural scenario.

7) So far Indian agricultural has failed to exploit the diversified product base from large number of agro-climatic regions for consolidating its position in the global market.

8) Export of farm product mainly consist of traditional items like Tea, Jute, Coffee, Rubber, Spnesh etc. were increasing not because of WTO provision.

9) At the present juncture, the developed nation have already taken a great leap forward in bio-technology, tissue culture and other related frontiers of scientific research which would give them further cost advantage in the production of commodities. Real and sustainable cost reduction is achieved only through increased productivity through adoption of technology. In India there is huge gap due to inadequate transfer of technology from lab to land.

10) In terms of quality most of Indian farm products do not conform the international standards on account of sanitary and phyto sanitary (SPS) restriction processing and packaging specifications etc.

11) Market imperfection – Studies shows that the share of primary producer of perishable high value farm product in the consumer rupee normally ranges from 15-30 per cent, a share which is too low to attract the farmers to generate real surplus of farm produce of the desired quality to benefit the exporter. Why should the farmer take the pain to produce surplus when the lion share of the profit goes to the traders and to intermediates.

12) Given the stringent health standards consumer in the developed countries will unlikely buy Indian fresh or processed vegetables and fruits due to high pesticide and insecticides residues. The unhygienic way in which animals are slaughtered and the meat is processed will not be accepted in other countries.

13) Product price differential in international market ignoring the quality differential will not promote export. For example only basmati rice is exported not the other varieties beside the price differential.

5.10 Impact of WTO Commitment on Indian / State Agriculture

The implication of WTO on agriculture in India are many and all pervasive. Serious concern is being expressed about future of Indian agriculture with the implementation of WTO agreement with the above mentioned perception and ground realities, what are the options available to country to deal with WTO provision ? how judiciously these option can be used ? What is our preparedness to deal the WTO ? what should be an long term trade policy to safe guard producers and consumers ? These question can be answered by critical analysis by categorising the challenges, strategies, opportunities under the following heads.

1. Market access for agril products.
2. Domestic support
3. Export subsidies
4. Agreement of TRIPS (trade related Intellectual Property Rights)

5.10.1 Challenges

A. Market Access :

1. Reduction in import tariff and free trading of agril commodities will adversely affect the domestic market of agriculture product.
2. Removing quantitative restriction on still, more commodities including agro. processed products will give severe blow to our infant agro processing industry.
3. Trading block of European countries and America discriminate the equal play ground for trade to member countries. NAFTA, ASEAN, ACP countries have discriminated import and export tariffs and enjoy separate stocks in international trade.
4. Lower efficiency of Indian agriculture particular in M.P. resulting comparatively high cost of production of crops will adversely effect the agril export.
5. In India and particularly in M.P. the imperfection of agril market which include a big chunk of unorganised market involving wide range of market functionaries, is already detrimental to the interest of the farmer. The international free trade may further injure the interest of Indian and state farmers. Particularly in inputs marketing of seeds, fertilizers, power by MNCs.

6. Indian agriculture is unorganised and dominated by marginal and small farmers with poor base resource and illiteracy. They are plunged in trading world to compete with the farmer of developed countries who are well versed with scientific farming and having commercial attitude with the strong protection of their respective Govt. The situation can not be turned to Indian advantage unless the major share in the gains from the trade in the form by higher prices and profit is passed on to the farmers especially the most disadvantaged small and marginal once.

B. Domestic Support

1. Discrimination in AMS (Aggregate measure of supports) by developed countries with special and differential treatment for member countries. Developed countries avail the advantage of green box measure by providing subsidies in following ways to their farmers.

   a. Inputs Subsidies
   b. Market Price Support
   c. Market Subsidies in transportation storage etc.
   d. Direct income support
   e. Subsidies for long term investment.

2. India is gradually reducing the level of subsidies and product specific support under the developing countries and blue and Amber box by WTO provisions which will ultimately raise the cost of production of farm products.

C. Export Subsidies

1. The post WTO period has witnessed sharp dicline in international prices of agricultural commodities which has adversely affected the export earnings of developing countries like India.
2. Developed countries are able to protect the agriculture by providing export subsidies to the farmers to compete in global market and to large extent from surge of cheap imports as these countries are permitted to raise high tariffs walls.
3. Developing countries are facing serious threats from import surge as these countries had to remove quantitative restriction and they are not entitled to raise high tariffs walls like developed countries.

4. Forced import of food grain to the extent of atleast 3 to 5 per cent over period of six years aggravate the situation of already bumping up of ware houses.
5. Sanitary & phyto sanitary standards are high in developed countries and amendment are being made from time to time to raise these standards under article 3.3 of SPS which will restrict export by India and other developing countries.

D. Agreement on TRIPS

1. The patent rights to plant and livestock may have adverse effect Indian breeding programme. The multinational companies (MNC) may inter in to seed, fertilizer, pesticide and other sectors and will hold large proportion of the business. This may leads to shift in farming system which may not be advantages position to small and marginal farmer community.
2. The use of indigenous knowledge may be prohibited if patent are taken up by developed countries. Uncalled threat may raise for protection of our rights on indigenous natural endowment e.g. Neem Turmeric, Basmati rice.
3. Seed manipulation might be distructive of biodiversity as the spread of modern varieties in green evaluation has been important cause of genetic erosion (Shiva V. et.al 1999).
4. Indian agriculture research infrastructure which is mainly of institutional or government endeavour may get severe blow as developed countries having better bio technological advancements.
5. Blind race of scientific development may disrupt the ecosystem and may damage to biodiversity of India.
6. Relatively increase in cost of seeds technology.
7. Patent laws for agril products are to be modified in wake of WTO provision.
8. For protection of plant varieties, farmer and plant breeder rights, an effective legislative and administrative frame work will be required.
9. Genetic erosion and loss of bio-diversity in Indian agriculture.

5.10.2 Opportunities

1. India, in general, and M.P. in particular is very rich in bio-diversity. The patent of gene and micro-organism of particular type may not affect the breeding programme

directly. In view of the wide range of agro-climatic situations, the location specific research programmes will come up by using farmer's traditional wisdom.

2. The cost of agricultural produce are high in India/ State. Indian farmers will enter in competitive era by adopting improved agriculture for cost effectiveness in free trade economy.
3. The European union countries are using the Green Box and EMR (Exclusively Market Rights) to provide incentive for agriculture. Government of India & Government of M.P. may also use the same provision for our farmers.
4. For export of agricultural commodities, State is rich in bio-diversity and may export indigenous agricultural products such as spices, condiments, fruits, flowers, medicinal plants etc. Export of GM product is rejected by developed countries, thus we get an opportunity for export of organic product to developed countries. Organic and non-GM farm products are in great demand India may use traditional wisdom for its production and export as organic farms of cotton and groundnut are developing in Nimar & Malwa regions of M.P.
5. Opportunities exist for harnessing our strength in tea, rice (Basmati). Cotton, tobacco, castor oil, pepper, deoiled cake, gram, arhar and mustard oil.
6. Export subsidies may be enhanced for agricultural product e.g. cut flowers, D.O.C, spices.
7. Promoting research, extension and education in agriculture in a meaningful way is desired.
8. Upstream the research by balancing conventional and new bio-sciences by Government and Corporate sector of the economy.
9. The private investment by corporate sector for infrastructural development, transport, storage etc. may be encouraged.
10. The emerging issues and strategies in agriculture may be reviewed at State level for policy formulation.

5.10.3 Suggestions :

1. Export and import of agricultural products can be made in favour of export by taking the comparative advantage of the product which are cheaper and in abundance in the State.

2. Strengthening of marketing organization structure and operations for all agricultural commodities.
3. Commodity-wise strategy for all the agro-climatic regions of the State should be planned by taking into consideration the economic viability.
4. Cooperatives and Corporate Sector should be encouraged for investment in agriculture.
5. Price structure of input and output should be monitored by Government.
6. Infrastructural development for roads, transport, storage, electrification should receive its due share.
7. Land reform should be implemented in letter and spirit such as consolidation of holding, distribution of surplus land from land ceiling etc.
8. General Insurance of crops should be broad based with simplified procedure and less premium to cover the risk in farming – crops, livestock, fisheries, poultry etc.
9. For diversification in farming, production modules with economic options may be prepared and complimentary linkages may be explored.
10. Delineate areas of resource endowment of comparative advantage of commodities and develop excellence in those areas.
11. Information technology for agriculture may be strengthened for dissemination of agricultural technology at gram panchayat level. Training and education for Human Resource Development is needed.
12. Synergies and overcoming the problem on following aspects :
    (a) Narrowing the credit gap.
    (b) Harmonization of activities.
    (c) Market intelligence
    (d) Complimentary in technology generation, assessment, refinement and transfer.

5.11 STRATAGIES :

To square up the challenges of WTO provisions multi dimensional strategies may be fram. Some of them are below categorically :

A. Research :

1. In order to capitalise on the increased market access and to edge out the other competitors a continuos technology up gradation becomes imperative to lower the

cost of production of agricultural commodities. This clearly calls for an increased investment, private as well as public in agricultural research both in frontier areas of basic research and applied research for generation of technology consistent with higher productivity and Ecological / Environment sustainable.

2. **Patronage for Research :** At least one per cent of GDP should be invested in the research and technology with specific reference to bio technology.
3. Comparative analysis of competitiveness and cost of production in different regions of the country for comparative advantage over other may be worked out.
4. India particularly M.P. have massive stock of germ plasm which can be used for developing plant varieties at regional level.
5. For diversification in farming production modules with economic options may be prepared and complimentary linkages may be explored.
6. Agronomy of crops should be so developed & practiced by export oriented unit and agriculture export zones may be ear marked for different agril products.
7. Non GM varieties of soybean, cotton and duram wheat may be grown extensively for export.
8. In view of low consumption of agro-chemicals, organic production of agriculture produce has great future to export the quality organic products to all consumer of developed countries.
9. There are potential areas for development of excellence in crops and live stock production they should explored export purpose.

B. Improvement in Market Imperfection :

1. For making Indian agriculture globally competitive it is necessary that marketing efficiency is increased by restructuring the organisational and operational aspects. The situation can not be turned to India's advantage unless the major share in the gains from trade is passed to the farmers specially the most disadvantaged small and marginal farmer by eliminating the avoidable middle men and there by narrowing down the existing price spread. Effective safe ground against exploitation of the primary producers by trades at national and international level.
2. In order to become a significant players in the world market it is necessary to ensure a sizeable marketable surplus of the exportable farm product through faster growth in productivity then that of population and domestics demand. The productivity growth

should also be higher than the inflation rate to result in reduction in real cost of production.

3. Creation of market intelligence cell at state level which will update the information of regional, national and international level.
4. Incentive and strengthening for cooperative agricultural marketing to safeguard the interest of small and marginal farmers.

C. Post harvest management :

1. Agro-based industries should be given incentive in rural areas for value addition and to reduce the post harvest losses which are heavy.
2. The quantity to agro-product, raw or processed meant for export has to be improved to meet the stringent international standard.
3. Government should establish network of quality testing lab to assistant the SPS standard for export.
4. Infrastructural development :

    a) Investment in small infrastructrure should be increased with a length and direct access of small farmers to institutions, domestic market etc.
    b) Govt. private trade and exporters should take the onus of increase investment in transport, storage, power and other infrastructure facilities.

D. Extension and information dissemination

1. Educate the farmers regarding WTO provision and necessary training should be provided to all categories of farmers so as to make them understand the desired international standards for specific commodities.
2. Restructuring and developing institutional extension and information services at panchayat level.
3. Promoting coordination between public and private sector for dissemination of technology to farmers. For public sector emphasis should be on small farmers and for private sector to large farmers.
4. Major public awareness programme should be launched through institution and media to educate farmers as implication of W.T.O. agreement on agriculture which is to determine the fate of millions upon millions of our farmers must be made known to the concerned masses

E. Legislative Provision

1. EXIM policy should be restructured. Export subsidies may be enhanced in tune with the international prices fluctuation.
2. Anti dumping act may be visualise in national interest e.g. malasion palm oil is pouring in Indian market from Nepal.
3. India should harmonise its national food and nutritional security for agricultural product with international standards.
4. The bill on production of plant varieties and farmers rights may be inacted in letter and spirit. Farmers can derive full benefits of these legislation only with proper awareness about the provision of this act.
5. Public sector research and capabilities should be encouraged to minimise of neutrilise the monopolistic prospects in the seed sector from the multinational interest.
6. Public policy on research and service sector for agricultural be evolved in such a manner to restrict or prevent dominance of multinational in the major sector of national agriculture.
7. As many, European & American countries formed their group for trading India should also join hand with the developing countries for trading.
8. Corporate sector should be encouraged for brand equity of certain agricultural products, as with the macdowell, Canterbury etc.
9. As long as subsidized agriculture is not dismantled across the world, particularly in agriculturally surplus/developed countries, subsidies to Indian farmers should not be removed or reduce. Current subsidies to Indian farmers is within the deminimis level approved under the WTO. However, to make to WTO complaint, necessary modification in the delivery of subsidy be made.
10. Corporate or Contract farming with adequate legal safeguard should be promoted and linked worth the small & marginal producers

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Study No.89

EXECUTIVE SUMMARY

AGRICULTURAL POLICY IN MADHYA PRADESH: A POLICY MATRIX IN A FEDERAL STRUCTURE

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DECEMBER, 2003

5.12 Policy Matrix

Table 5.3 State Level Policy Matrix for repositioning/ restructuring of State Agriculture

S. No.	Issues	Action Points		Department/Agencies which would initiate such actions
1	To achieve 6 per cent growth rate in agricultural output by increasing productivity.	i)	The seed replacement rate of all major crops viz. soybean, rice, gram and wheat etc. will be doubled so as to bring it to national level.	State Department of Agriculture
		ii)	To increase the availability of breeder and foundation seeds, suitable to particular area. JNKVV and State farms shall be strengthened and Beej Nigam Farms will be privatized.	State Department of Agriculture
		iii)	The availability of certified seeds will be increased by, * Enlarging the role of Beej Nigam * Encouraging Seed Growers' Cooperative Societies. * Involving seed grower private companies * Strengthening the ongoing programmes of 'Annapurna' and 'Surajdhara for the benefit of small and marginal farmers and SC/ST category.	State Department of Agriculture
		iv)	The use of hybrid seeds will be encouraged.	State Department of Agriculture
		v)	Research will be focussed on high yielding pest resistant pulse varieties.	State Department of Agriculture
		vi)	The following crop specific interventions will be made for enhancing productivity;	State Department of Agriculture
		Soybean * Research will be focussed on early maturing disease free varieties. * Improved agronomical practices will be introduced and farmers will be persuaded to adopt them. * To counter insect attack larger assistance will be provided for plant protection measures.		State Department of Agriculture
		Paddy * Seed availability of high yielding, early maturing varieties will be increased. * Upland paddy cultivation will be discouraged. * Plant protection measures will be encouraged in the case of insect attack. * Farmers will be encouraged to adopt improved agronomical practices. * For control of weeds, use of mechanical means along with controlled use of weedicides will be encouraged.		State Department of Agriculture

	Wheat * Balanced use of fertilizers will be encouraged. * Timely sowing and timely irrigation will be encouraged. * Application of zinc sulphate to counter the zinc deficiency will be encouraged. * Seed availability of low water requiring varieties will be increased by enlarging incentive on seed production. * Cultivation of 'durum' wheat will be encouraged by adopting cluster approach to facilitate marketing. * Corporates will be linked with production programme to facilitate marketing.	State Department of Agriculture
	Gram * Research will be focussed on evolving pest tolerant varieties. * Integrated Pest Management (IPM) will be promoted by providing higher allocation. * Multiplication of seed will be increased by providing incentive on seed production.	State Department of Agriculture
	Cotton * Farmers will be encouraged to plant high yielding varieties and Genetically Modified (GM) Bt.Cotton in pursuant to GOI policy and State Textile Policy. * Larger financial aid will be provided for adopting Integrated Pest Management (IPM) practices. * Suitable mix of intercropping will be promoted and availability of seeds for other crops will be ensured. * Facility for cotton seed delinting will be developed.	State Department of Agriculture
vii)	Fertilizer consumption of NPK to be in the ratio of 4:2:1	State Department of Agriculture
viii)	Fertilizer consumption to be steadily increased to catch up with the national level.	--------"---------
ix)	Cultivated area to be increased by bringing non forest wastelands, ravine lands and grazing lands under cultivation	--------"---------
x)	Cropping intensity to be increased to 150 to 200 per cent	--------"---------
xi)	Emphasis will be given on cultivation of cash crops like pulses, oilseeds, cotton, sugarcane and crops identified for export, etc.	--------"---------
xii)	Presently total power generation in State is 2,900 MW by 2006-07 the projected power generation shall be around 7,401 MW. Thus adequate power supply for agricultural operations at the time of need will be ensured.	Department of Energy
xiii)	All villages/mandis will be connected by all weather roads	P.W.D. & RRDA
xiv)	In view of varied conditions existing in different agro-climatic regions, the policy will lay emphasis on regional planning. Therefore, appropriate farming systems for different agro-climatic conditions will be formulated.	State Department of Agriculture

2	To provide satisfactory standard of living including food and nutritional security.	i)	Strategy for crop diversification of low value crops by remunerative crops in a time bound manner will be developed and will be implemented in the given time frame.	State Department of Agriculture
		ii)	Upland paddy cultivation will be replaced by remunerative crops like pulses and oilseeds etc.	----------"----------
		iii)	To make the small size holdings economically viable, farming of horticulture crops and activities related to dairying, poultry, aquaculture, piggery and apiculture etc. will be promoted.	Department of Agriculture/ Horticulture/ Veterinary Sciences & Animal Husbandry/ Khadi & Village Industries Commission
3	Watershed Management	i)	Degraded lands to be brought under social forestry, agro-forestry and horticultural crops	Forest/ Agriculture/ Horticulture/ Rural Development Department
		ii)	Plantation of Jatropha, Neem and Karanj on wastelands, degraded lands, nurseries and field bunds will be taken up on a large scale to promote bio-fuel and thereby increase farm income,	Agriculture/ R.D Deptt.
		iii)	Reclamation of ravine lands of Chambal and other river basins will be carried out as fast as possible. For this task, Government of India shall be approached for financial aid.	Agriculture / Forests / Revenue Deptt.
		iv)	Watershed Development Programme will be implemented on a large scale through community participation.	Agriculture / Rural Development/ Soil Conservation
		v)	For Watershed Development Programme, need based credit will be arranged from NABARD'S Wastershed Development Fund (WDF)	Finance Deptt.
		vi)	Untapped groundwater will be harnessed.	Agriculture./ Water R.D../ Tubewell Directorate
		vii)	In areas, which fall under 'dark' and 'gray' categories, further exploration of wells and tube wells, will be banned.	----------" ----------
		viii)	Water use efficiency will be increased by upgrading the irrigation systems and educating the farming community for optimum use of irrigation water	Water Resource Department
		ix)	Series of small check dams will be constructed on rivers and rivulets.	Water Resource Department
		x)	Micro overhead pressured irrigation systems like 'drip' and 'sprinkler' irrigation will be encouraged.	Agr. Deptt.
4	To provide farmers with appropriate Technology, inputs, services and incentives	i)	Soil testing will be done for entire cropped area in every village and fertility maps for all the villages will be prepared.	State Department of Agriculture
		ii)	Soil testing will be done after every seven years.	----------"----------

		iii)	Well-equipped soil testing laboratories with the testing facilities including micronutrients will be established in each district.	State Department of Agriculture
		iv)	Agricultural graduates will be encouraged to establish their own agriculture polyclinics in private sector.	----------"----------
		v)	Fertilizers and plant protection testing laboratories will be modernized and their numbers will be increased to meet the growing needs of good quality fertilizers, insecticides and pesticides.	----------"----------
		vi)	Every 'Kisanbandhu' will be given a fertilizer testing kit so that he is able to carryout quick test of fertilizer quality.	----------"----------
		vii)	Thrust shall be given on Integrated Nutrient Management (INM) & Integrated Pest Management (IPM).	----------"----------
		viii)	Suitable practices of inter-cropping and mixed cropping will be encouraged.	----------"----------
		ix)	The benefit of tissue culture technology will be provided to the farmers, and its large scale adoption will be encouraged to cover all agro-climatic zones, including wastelands and degraded lands.	----------"----------
		x)	Priority shall be given to large-scale production of breeding material through tissue culture.	----------"----------
		xi)	Improved agricultural implements and technology will be popularized among farmers	----------"----------
		xii)	Providing Farmers with adequate mechanical farm power for timely completion of farm operations.	----------"----------
		xiii)	Providing incentives for the import of mechanized equipments for commercial crops and equipments which are not being manufactured in the country.	----------"----------
		xiv)	Encouraging industries to adopt BIS/ISO specifications for production of quality agricultural machinery.	----------"----------
		xv)	Strengthening of farmers training centres for imparting training to farmers and farm women on agricultural machinery	----------"----------
		xvi)	Farmer's advisory service will be started	----------"----------
5	Cooperative infrastructure for agricultural credit and inputs;	i)	Effective strategy will be put in place for facilitating the agricultural credit availability	Cooperative./Institutional Finance
		ii)	District Central Cooperative Banks shall be strengthened to meet the agricultural credit needs.	Cooperative Department
		iii)	District Central Cooperative Banks shall be persuaded to lower down the interest rates on farm loans as per the guideline of GOI and Reserve Bank.	--------"------
		iv)	Role of seed growers Coop. Societies shall be redefined to make their purpose meaningful for increasing the availability of quality seeds.	State Department of Agriculture & Cooperative
		v)	Cooperative Institutions will be encouraged to establish commodity markets and for this the AMPC Act will be suitably amended	----------"----------
		vi)	Horticultural Produce Coop. Societies shall be encouraged to establish pre-cooling, storages, processing, grading, packing and marketing facilities for fruits and vegetables in Mandi Yards.	----------"----------

6	To refocus extension activities to emerge as a potent conveyance to acquaint farmers with market demand and developments in transfer of technology through extension services.	i)	The existing public extension system will be replaced by a multi agency extension system	State Department of Agriculture
		ii)	Private business houses, which are willing to undertake extension work, will be encouraged.	----------"----------
		iii)	In place of contact farmers, extension through women and Self Help Groups will be promoted and a definite strategy shall be put in place to achieve this objective.	----------"----------
		iv)	The "Kisanbandhu" Scheme, will be strengthened to include the dissemination of newer technologies.	----------"----------
		v)	Training practices will be revamped and integrated so that farmers are able to get the market information.	----------"----------
		vi)	One Krishi Vigyan Kendra in each district shall be established and for this required government land will be provided free of cost.	----------"----------
		vii)	Use of information technology, and the electronic media and print media shall be vigorously promoted for dissemination of improved practices.	----------"----------
		viii)	Every Zonal Agricultural Research Station will adopt one village every year in each Agro- climatic zone where special extension works would be undertaken to demonstrate the efficacy of improved technology.	State Department of Agriculture ./ JN Krishi Vishwa Vidyalaya(JNKVV)
		ix)	Women will be made the target group for the public extension system and it will be ensured that they receive information relevant to their work, particularly with reference to crops and livestock.	State Department of Agriculture
		x)	The number of female extension workers will be increased.	----------"----------
7	Involvement of Panchayati Raj Institutions	i)	The Krishi Samities of the Gram Sabhas shall be made the nodal extension arm at the village level.	State Department of Agriculture
		ii)	Zila Panchayats, Janpad Panchayats and Village Panchayats will be designated as Implementing agencies for various central and state programmes in their jurisdiction.	----------"----------
		iii)	Gram Sabha and Panchayati Raj Institutions (PRIs) will be empowered to decide their developmental priorities and formulate the plans accordingly.	----------"----------
		iv)	Gram Sabha and PRIs will have powers to play active roles in framing the policies/ programmes.	----------"----------
		v)	Gram Sabhas will have powers to monitor the implementation of key village development programmes. Similarly, Gram Panchayats will have powers to monitor implementation of programmes in their jurisdiction.	----------"----------
8	To develop agricultural marketing and processing infrastructure to ensure remunerative prices to the farmers.	i)	Existing physical infrastructure in mandi yards will be upgraded with facilities for sieving, grading, sorting and drying of agricultural produce to help the farmers to fetch better prices. Private sector will be encouraged for this purpose.	State Department of Agriculture
		ii)	Contract farming of selected crops will be encouraged for smooth marketing.	----------"----------
		iii)	For giving impetus to horticulture activity in the state, specialized infrastructure like cold chains, sorting, pack houses, cold storages, etc. will be developed in mandi yards through participation of private sector.	----------"----------

		iv)	Reputed agri-business firms engaged in trading and agro-processing will be encouraged to take over the responsibility of developing the linkages between the farmers and markets.	State Department of Agriculture
		v)	Direct marketing of fresh produce will be promoted in order to increase income to farmers and benefits to the consumers.	----------"----------
		vi)	Market regulation will be simplified to be transparent.	----------"----------
		vii)	Specialized market yards to meet specific requirement of niche markets such as flowers and perishable commodities will be developed.	----------"----------
		viii)	Cooperative institutions will be encouraged to set up their own markets and for this suitable amendments will be made in the APMC Act.	----------"----------
		ix)	Information technology mandi operations will be established to increase the reach of mandis and enable information dissemination.	----------"----------
		x)	Market intervention mechanism will be put in place wherein State will undertake the purchases of commodities whose prices are likely to change.	----------"----------
		xi)	The M.P. State Warehousing & Logistics Corporation has installed storage capacity of 6,61,043 tonnes and has taken 2,36,000 tonnes storage capacity on rental basis. There is facility of upto 75 per cent credit on warehouse receipt under Negotiable Instruments Act. This storage capacity will be further increased to meet future requirements.	Food Department
9	To promote exports of agricultural commodities	i)	Contract farming will be promoted for such commodities which have export potential like pulses, wheat, (specially durum wheat), soybean, spices, onion, garlic and Malwa potato	State Department of Agriculture
		ii)	Adequate training will be provided to producers, processors, exporters etc. on quality production, pre and post harvest management, etc.	----------"----------
		iii)	Research and Development activities for evolution of exportable and disease free varieties will be undertaken	----------"----------
		iv)	Necessary infrastructure like electricity, warehousing, grading, sorting, packaging, cold storages etc will be created in AEZ areas by obtaining central assistance. Investments from entrepreneurs will also be encouraged.	State Agriculture Deptt./ & State Agro Industries Development Corporation
		v)	Organically grown agriculture produce has huge demand in international market. The state has taken a lead in organic farming. To promote the export of organic produce, an accredited testing and certification facility will be developed.	----------"----------
		vi)	Access to international markets due to Agreement on Agriculture (AOA) under WTO has increased the opportunities of Agri-Export. However, in order to meet international competition, there is need to reduce the cost of production, and enhance productivity, besides maintaining quality to match international standards. Therefore, the farming community will be provided suitable technology inputs and training.	----------"----------
		vii)	On export of agri-produce from AEZ areas, a subsidy of 50% to the cost of transport upto port, will be provided to the exporters.	----------"----------

10	To strengthen the Research and Education Infrastructure	i)	Qualitative improvement will be brought in agricultural education to bring it at par with international levels.	JNKVV
		ii)	Agricultural research will be made farmer oriented so that it can generate profitable technologies for various agro-climatic and socio-cultural conditions.	JNKVV
		iii)	Emphasis of agricultural research will be on developing disease free high yielding varieties of pulses and oilseeds.	-----"-----
		iv)	The market/demand orientation will be an integral part of research programme	-----"-----
		v)	Traditional biological wealth of different agro-climatic conditions will be protected to ensure genetic purity, by establishing Gene-Banks.	-----"-----
		vi)	The state will provide support to JNKVV for undertaking research in Biotechnology with emphasis on adaptive research	State Agriculture Deptt../ JNKVV
11	Horticultural Development	i)	The cultivation of horticultural crops will be promoted in selected areas in the state. For this, a time bound strategy will be put in place.	State Department of Horticulture
		ii)	A Nursery Act will be enacted to facilitate availability of quality planting material	-----"-----
		iii)	The use of hybrid vegetable seeds and plants developed by tissue culture will be promoted	-----"-----
		iv)	The state will aim to double the production of fruits and vegetables.	-----"-----
		v)	The production of garlic, onion, potato, coriander and fenugreek will be doubled	-----"-----
		vi)	Emphasis will be given on production of horticultural crops, which have export potential.	-----"-----
		vii)	Traditional horticultural crops will be extended to new areas.	-----"-----
		viii)	By use of modern techniques, unproductive and old orchards will be made productive.	
		ix)	Farmers will be provided liberal financial assistance for planting fruit bearing plants in non-forest waste lands for 3-5 years, till the plants start bearing fruits.	-----"-----
		x)	Traditional areas of flower cultivation shall be identified and floriculture will be promoted in these areas to meet domestic as well as export needs. For the export of flowers, new technology as well as market information, shall be provided to the entrepreneurs.	-----"-----
		xi)	Horticulture farming will be backed by the latest technology.	-----"-----
		xii)	Drip irrigation for horticultural crops will be promoted.	-----"-----
		xiii)	In order to give a boost to horticultural activity, a cold chain infrastructure will be developed, through private participation. In addition to this, specialized infrastructure for fruits and vegetables like grading, sorting, pack houses, cold storages etc. will be created in mandis through private sector.	-----"-----
		xiv)	Contract farming of selected horticultural crops will be encouraged.	Agri. Deptt.
12	To Promote Organic Farming	i)	Balanced and integrated use of biomass, organic and inorganic fertilizers and controlled use of agro chemicals will be encouraged for sustainable agricultural production. A statewide programme to sensitize the farming community will be launched.	State Department of Agriculture

		ii)	Use of locally available bio degradable waste, bio-fertilizers and bio pesticides shall be encouraged.	State Department of Agriculture
		iii)	Research shall be focussed on development of bio-fertilizers and new varieties of bio-pesticides.	-----"-----
		iv)	Entire state will be covered by launching a concerted programme to adopt eco-friendly agriculture involving the use of bio-degradable wastes, bio-fertilizers and bio-pesticides.	-----"-----
		v)	Use of green manuring, NADEP compost, vermi-compost, blue green algae, organic manure, bio- fertilizers and culture will continue to get encouragement.	-----"-----
		vi)	Special emphasis will be laid on rural sanitation by ensuring safe disposal of animal and human wastes through community biogas plants, and providing street lights in the villages. Other biomass will be used for composting etc.	-----"-----
13	Risk Management	i)	All farmers, whether loanee or non-loanee, will be encouraged to get their crops insured under National Agricultural Insurance Scheme or any other suitable scheme.	State Department of Agriculture
		ii)	Union Government will be persuaded to declare all crops under the National Agricultural Insurance Scheme, irrespective of area coverage and the Patwari Halka to be the crop yield estimation unit.	-----"-----
		iii)	State will persuade the Government of India to declare MSP of agricultural crops one season ahead and keep the MSP on higher side for pulses and oilseeds to facilitate crop diversification.	-----"-----
14	To integrate the sectors of power and irrigation	i)	Existing irrigation infrastructure will be upgraded so as to operationalize full created potential.	W.R.D.
		ii)	The Water User's Associations will be actively involved in efficient management and distribution of irrigation water.	--------"------
		iii)	Time frame set for creation of additional irrigation portential shall be strictly adhered to.	---------"-----
		iv)	The existing generation facilities will be repaired and upgraded in a given time frame.	Engg. Deptt.
		v)	Presently total power generation in State is 2900 megawatt. By 2006-07 the projected power generation shall be around 7401 megawatt. Thus adequate power supply for agricultural operations at the time of need will be ensured.	Energy Deptt.
		vi)	So far irrigation potential created by all sources is of 48.99 lakh hectares. Nearly 3.40 lakh hectares additional area is projected to be brought under irrigation by the end of tenth plan period, by creating canal irrigation. The created potential will be fully utilized and operational inefficiencies will be addressed.	W.R.D.

15	To Streamline existing, and introduce, new legislation, where necessary and to orient the roles of the administrative machinery and the stake-holders from time to time, to achieve the objectives of this policy.	i) ii)	All existing Acts/ Statutes/ Rules, relevant to the facilitation of objectives of this policy will be reviewed and areas where amendment or new legislation is required, will be identified. The new legislation or amendments will be enacted in a given time frame.	All concerned deptt. --------"---------
16	To enhance the income from agriculture and for ensuring food security animal husbandry sector should be encouraged.	i)	Activities related to dairy, poultry, acquaculture, piggery, and apiculture have to be encouraged.	State Department of Veterinary Science and Animal Husbandry and Veterinary College of Jabalpur and Mhow under JNKVV.